REDMOND PAIRED WATERSHED STUDY

WATER YEAR 2019 DATA SUMMARY REPORT

Prepared for
City of Redmond

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA

Note:
Some pages in this document have been purposely skipped or blank pages inserted so that this document will copy correctly when duplexed.

REDMOND PAIRED WATERSHED STUDY

WATER YEAR 2019 DATA SUMMARY REPORT

Prepared for
City of Redmond
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Redmond, Washington 98052

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June 30, 2020

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INTRODUCTION

The Redmond Paired Watershed Study (RPWS) is one of several effectiveness monitoring studies that was selected for implementation starting in 2014 for the Stormwater Action Monitoring (SAM) program for Puget Sound. The goal of effectiveness monitoring under the SAM program is to provide widely applicable information for improving stormwater management in the region. Phase I and Phase II Municipal Stormwater Permittees in the Puget Sound Region contribute to a Pooled Stormwater Resources Fund that supports the SAM program and associated effectiveness monitoring studies. Selection of the RPWS for implementation under the SAM program was made based on a monitoring proposal that was presented to permittee representatives at workshops that were held on March 20, 2014, and May 6, 2014. The specific study question to be addressed through the RPWS is as follows:

> *How effective are watershed rehabilitation efforts at improving receiving water conditions at the watershed scale?*

To address this study question, a conceptual experimental design for the RPWS was subsequently developed and summarized in the *Redmond Paired Watershed Study Experimental Design Report* (Herrera 2015a). This conceptual experimental design was informed by a literature review (Herrera 2015b) that was conducted to identify lessons learned from past studies that have been implemented to achieve similar objectives. The conceptual experimental design was also developed based on input from a technical advisory committee that was formed for the study. This technical advisory committee includes representation from the following jurisdictions and agencies:

City of Redmond

City of Seattle

King County

Kitsap County

US Environmental Protection Agency

US Geological Society

Washington State Department of Ecology (Ecology)

Building on this previous work, a Quality Assurance Project Plan (QAPP) was developed to guide the implementation of all subsequent phases of the RPWS (Herrera 2015c). This QAPP documents the experimental design and procedures that will be used during data collection, processing, and analysis to ensure all results obtained for the RPWS are scientifically defensible.

Monitoring pursuant to this QAPP initiated in 2016 and is anticipated to continue for a 10-year timeframe. Data summary reports will be prepared on an annual basis over this period to summarize compiled monitoring data collected through each of the major components of the RPWS. These reports will also document any quality assurance issues associated with these data and resultant limitations (if any) on their use or interpretation. Finally, these reports will document all rehabilitation efforts that have been implemented by the City of Redmond (City) or King County (County) over the previous year. Included will be detailed information on the design and operational status of structural stormwater controls and the frequency and geographic extent of nonstructural stormwater control implementation. Each annual data summary report will document this information based on monitoring that was conducted over the previous water year (i.e., October through September). Data summary reports (Herrera 2017, 2018, 2019) were prepared previously for data collected over water years 2016, 2017, and 2018 (WY2016, WY2017, and WY2018), respectively.

In years 4, 6, 8, and 10 of the RPWS' implementation, trend analyses reports will also be prepared as companion documents to the data summary reports described above. The year 4 Trend Analysis Report will be prepared in the summer of 2020. These reports will summarize the results of statistical analyses that will be performed on the compiled data from all previous years of monitoring to detect potential relationships between rehabilitation efforts and improved receiving water conditions. Each report will also present major conclusions from these analyses.

This document represents the data summary report for monitoring that occurred over water year 2019 (WY2019) for the RPWS. It is organized to include the following sections:

- **Background** – An explanation of why the project is needed
- **Experimental Design** – The sampling process design for the study, including sample types, monitoring locations, and sampling frequency
- **Sampling Procedures** – A description of any major deviations from the sampling procedures that were identified in the QAPP for the study (Herrera 2015c).
- **Rehabilitation Effort Summary** – A description of all watershed rehabilitation efforts that were implemented by the City or County over the preceding water year.
- **Monitoring Results Summary** – A summary of compiled monitoring data collected through each of the major components of the study over the preceding water year.

BACKGROUND

Municipal Stormwater Permits are issued by Ecology to regulate discharges from separated storm sewers owned or operated by Phase I and Phase II cities and counties. The Municipal Stormwater Permits establish the minimum requirements for permittees to address existing and future impacts to receiving waters from urbanization. Municipal Stormwater Permits require cities and counties to execute programmatic (nonstructural) activities and establish design standards for stormwater structural controls triggered by development (onsite stormwater management, runoff treatment, and flow control facilities). In theory, if all developed land in a watershed is equipped with nonstructural and structural stormwater controls, the receiving water would be protected from hydrologic and water quality impacts caused by urbanization. However, while the effectiveness of nonstructural and structural controls has been well documented at the site and parcel scale, limited data exists on the effectiveness of these controls in aggregate for improving conditions in receiving waters at the watershed scale (Herrera 2015b).

In February 2014, Ecology approved a Citywide Watershed Management Plan (WMP) (Herrera 2013) for the City that coordinates stormwater management efforts from the Municipal Stormwater Permit, Section 303(d) of the Clean Water Act, and salmon recovery to allow use of a watershed approach for improving receiving water conditions. Through the implementation of this WMP, the City will focus stormwater best management practices (BMPs) in a subset of priority watersheds that are moderately impacted by urbanization and therefore expected to respond more quickly to rehabilitation efforts. This provides a unique opportunity to study the effectiveness of stormwater BMPs for improving receiving water conditions on an accelerated time frame and at a watershed scale. Recognizing this opportunity, the City is implementing the RPWS to quantify improvements in receiving water conditions with support from the SAM program.

EXPERIMENTAL DESIGN

As described in the *Introduction* to this report, the specific study question to be addressed through the RPWS is as follows:

> *How effective are watershed rehabilitation efforts at improving receiving water conditions at the watershed scale?*

In this context, rehabilitation efforts could include any of the following practices:

- Stormwater management retrofits in upland areas that would include facilities for onsite stormwater management (e.g., low impact development [LID] practices), runoff treatment, and flow control
- Riparian and in-stream habitat improvements
- Programmatic practices for stormwater management

To answer the study question identified above, the experimental design for the RPWP has two primary components:

- **Status and Trends Monitoring**: Routine and continuous measurements of various hydrologic, chemical, physical habitat, and biological indicators of stream health over an extended time frame to quantify improvements in receiving water conditions in response to watershed rehabilitation efforts.
- **Effectiveness Monitoring**: Measurements of hydrologic and chemical parameters over a relatively short timeframe to document the effectiveness of specific structural stormwater controls that have been constructed to improve receiving water conditions.

The Status and Trends Monitoring utilizes a "paired watershed" experimental design that involves collecting these measurements in seven watersheds categorized as follows:

- Three "Application" watersheds with wadeable lowland streams that are moderately impacted by urbanization and prioritized for rehabilitation efforts.
- Two "Reference" watersheds with relatively pristine wadeable lowland streams that do not require rehabilitation.
- Two "Control" watersheds with wadeable lowland streams that are significantly impacted by urbanization and not currently prioritized for rehabilitation.

Table 1 identifies the name, predominant land use/cover, and size of each watershed; the location of all the watersheds is shown in Figure 1. A detailed summary of conditions within each watershed is also provided in the QAPP that was prepared for the study (Herrera 2015c) with information on planned rehabilitation efforts in the Application watersheds as applicable.

Table 1. Application, Reference, and Control Watersheds for the Redmond Paired Watershed Study.

Watershed Name	Watershed Type	Dominant Land Use/Cover	Watershed Total Area (acres)	Watershed Area Inside Redmond (acres)
Evans Creek Tributary 108	Application	Residential	397	0[a]
Monticello Creek	Application	Residential/Commercial	345	264
Tosh Creek	Application	Residential/Commercial	299	276
Colin Creek[a]	Reference	Forest	1,990	90
Seidel Creek[a]	Reference	Forest	1,188	615
Country Creek	Control	Residential/Commercial	212	212
Tyler's Creek	Control	Residential/Commercial	168	167

[a] Watershed is in unincorporated King County.

Fixed monitoring stations were established in each watershed for monitoring various indicators of stream health. Due to the scale of the RPWS and the anticipated lag between applying stormwater controls and resultant improvements in receiving water conditions, quantifying a cause and effect relationship between these events may take many years. Therefore, monitoring at the fixed monitoring stations will occur over an anticipated 10-year timeframe. Furthermore, because the effectiveness of watershed rehabilitation practices (e.g., stormwater retrofits, in-stream habitat improvements, and programmatic practices) may vary for different types of receiving water impairments, a broad suite of indicators for assessing potential improvements are being monitored within the following categories: hydrologic, water quality, physical habitat, sediment quality, and biological. The pattern of interest will be evidence that receiving water conditions are improving based on one or more of these indicators in the Application watersheds while conditions in the Reference and Control watersheds remain relatively static.

The following subsections provide more detailed information on the Status and Trends Monitoring and Effectiveness Monitoring, respectively, including the monitoring stations, measurement frequency, indicators, and data analysis methods where applicable.

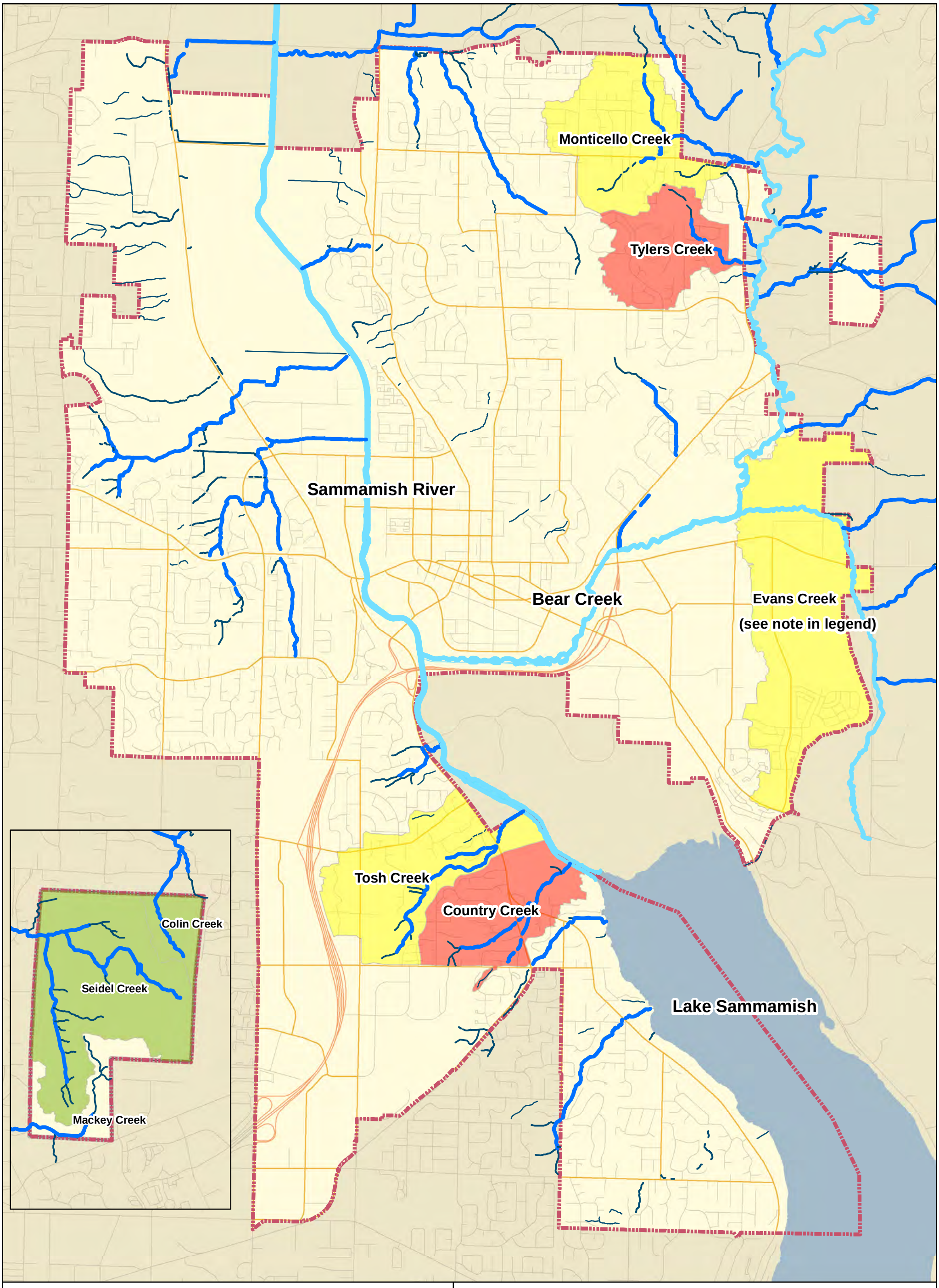

Figure 1. Application, Reference, and Control Watersheds.

City of Redmond, Washington
06/18/2015

CityofRedmond
WASHINGTON

N

0 0.25 0.5 1 1.5 Miles

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Legend

- Class I Stream
- Class II Stream
- Class III Stream
- Class IV Stream
- City Limits
- Reference Watersheds
- Application Watersheds
- Control Watersheds

This figure shows Evans Creek watershed within Redmond. Evans 108 is east of Redmond and illustrated in Figure 2.

STATUS AND TRENDS MONITORING

This section describes the monitoring stations, measurement frequency, indicators, and data analysis methods that will be used for the Status and Trends Monitoring component of the RPWS. This information is organized under separate subsections for the following monitoring categories: hydrologic, water quality, physical habitat, sediment quality, and biological. The specific indicators of stream health that will be evaluated in these categories are also summarized in Table 2 with their associated measurement frequency.

Table 2. Indicators of Stream Health for the Redmond Paired Watershed Study.

Indicator	Measurement Frequency
Hydrology Monitoring	
Flow	Continuous
High pulse count High pulse duration High pulse range Low pulse count Low pulse duration Low pulse range Flow reversal Richards-Baker (RB) flashiness index Flashiness ($T_{Q\ Mean}$) Storm flow volume Base flow volume Total flow volume	Post-processed from continuous flow measurements
Water Quality Monitoring	
Total suspended solids Turbidity Conductivity Hardness Dissolved organic carbon Fecal coliform bacteria Total phosphorus Total nitrogen Copper, total and dissolved Zinc, total and dissolved	Twelve grab samples collected annually during storm events (three each quarter) Four grab samples collected annually during base flow (one each quarter)
Temperature Conductivity	Continuous
Physical Habitat Monitoring	
Bankfull width Wetted width Cumulative bar width	Annually

Table 2 (continued). Indicators of Stream Health for the Redmond Paired Watershed Study.	
Indicator	**Measurement Frequency**
Physical Habitat Monitoring (continued)	
Bankfull depth Wetted depth Substrate class Substrate embeddedness Fish cover Thalweg depth Presence of bars Presence of edge pools Main channel slope and bearing Large woody debris tally, including notation of diameter, length, category, zone, and key-pieces Evidence of vegetation colonization below the ordinary high water mark (OHWM) that persists more than 1 year Slopes vegetated over the crown of the bank Presence of desirable native plant species Presence of invasive plant species Presence of good-habitat indicator liverwort species Channel incision or aggradation Channel widening, narrowing, or migration Changes in channel slope, sinuosity, and/or bed-form type	Annually
Sediment Quality Monitoring	
Total organic carbon; sieved, 2 mm Copper; sieved, 63 µm Zinc; sieved, 63 µm Polycyclic aromatic hydrocarbons; sieved, 2 mm Phthalates; sieved, 2 mm	Annually
Biological Monitoring	
Benthic macroinvertebrates	Annually
Benthic Index of Biotic Integrity Taxa Richness Ephemeroptera Richness Plecoptera Richness Trichoptera Richness Clinger Percent Long-Lived Richness Intolerant Richness Percent Dominant Predator Percent Tolerant Percent	Post-processed from benthic macroinvertebrate data

Hydrologic Monitoring

A total of 14 fixed monitoring stations were established to facilitate hydrologic monitoring in each of the study watersheds. As noted in the literature review (Herrera 2015b) that was performed to inform the experimental design for the RPWS, numerous studies have been conducted with similar goals, but they have generally been conducted at the subbasin scale. In these studies, a hydrologic monitoring station was typically located at the outlet of the study subbasin. Therefore, efforts were made to establish hydrologic monitoring stations at the outlet of each of the study watersheds. However, because the watersheds are relatively large and because much of the rehabilitation will occur in the upper reaches of the Application watersheds, efforts were made to establish hydrologic monitoring stations at a mid-point location in each of the study watersheds as well. This goal could not be achieved for all study watersheds due to issues relating to their size and drainage patterns. The following deviations are specifically noted:

- Monticello Creek has two major tributaries that will be the target of rehabilitation efforts; therefore, three hydrologic monitoring stations were established in the watershed at the outlet and on each of the tributaries.

- The relatively pristine reach of Colin Creek that was identified for monitoring is confined to the Redmond Watershed Preserve Park. Because the watershed area within this park is relatively small, only one hydrologic monitoring station was established in this study watershed.

- The relatively pristine reach of Seidel Creek that was identified for monitoring is confined to the Redmond Watershed Preserve Park. Within this area, two major tributaries of the creek flow into a large wetland complex near the border of the park. To avoid confounding hydrologic and water quality influences from this wetland, hydrologic monitoring stations were established on each tributary; and no outlet station was identified.

In addition to these considerations, the specific location of each monitoring station was also influenced by safety and property access issues. The monitoring stations established in each of the study watersheds are as follows:

Application Watersheds

- Evans Creek Tributary 108: Two stations designated Lower Stream Station (EVALSS) and Midstream Station (EVAMS), respectively (see locations in Figure 2).

- Monticello Creek: One station at the mouth designated Mont-Mouth (MONM); one station at the approximate midpoint of the watershed on the north tributary designated Mont–Mid-N (MONMN); and one station at the approximate midpoint of the watershed on the south tributary designated Mont–Mid-S (MONMS) (see locations in Figure 3).

- Tosh Creek: One station at the mouth designated Tosh-Mouth (TOSMO); and one station at the approximate midpoint of the watershed designated Tosh-Mid (TOSMI) (see locations in Figure 4).

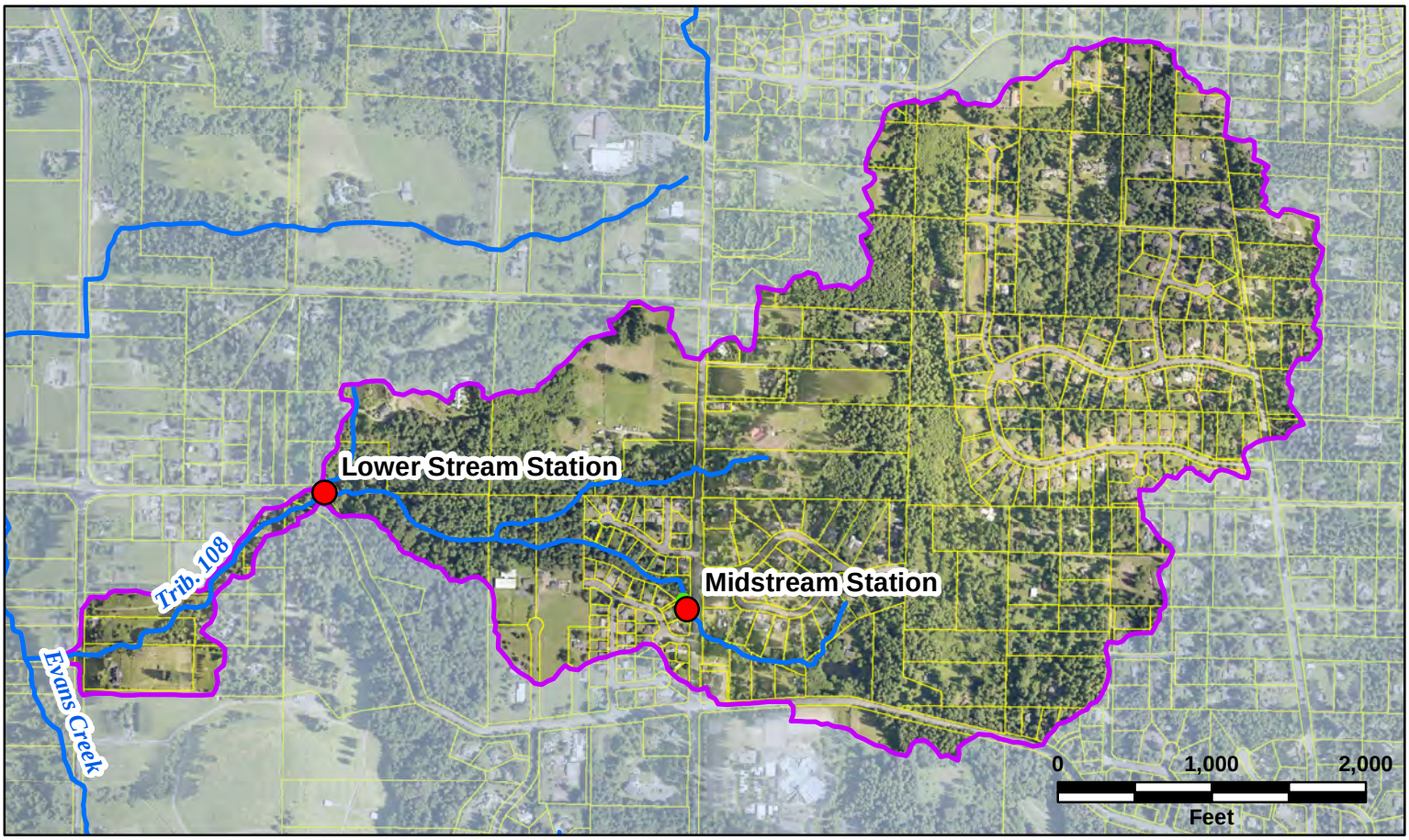

Figure 2. Evans Trib. 108 Paired Watershed Study Monitoring Locations.

King County, Washington

Dec. 17, 2015

Flow and WQ Monitoring

Habitat, Biological, and Sediment Monitoring

Streams and Rivers

King County Parcels

Basin Boundary

King County
Department of Natural Resources and Parks
Water and Land Resources Division

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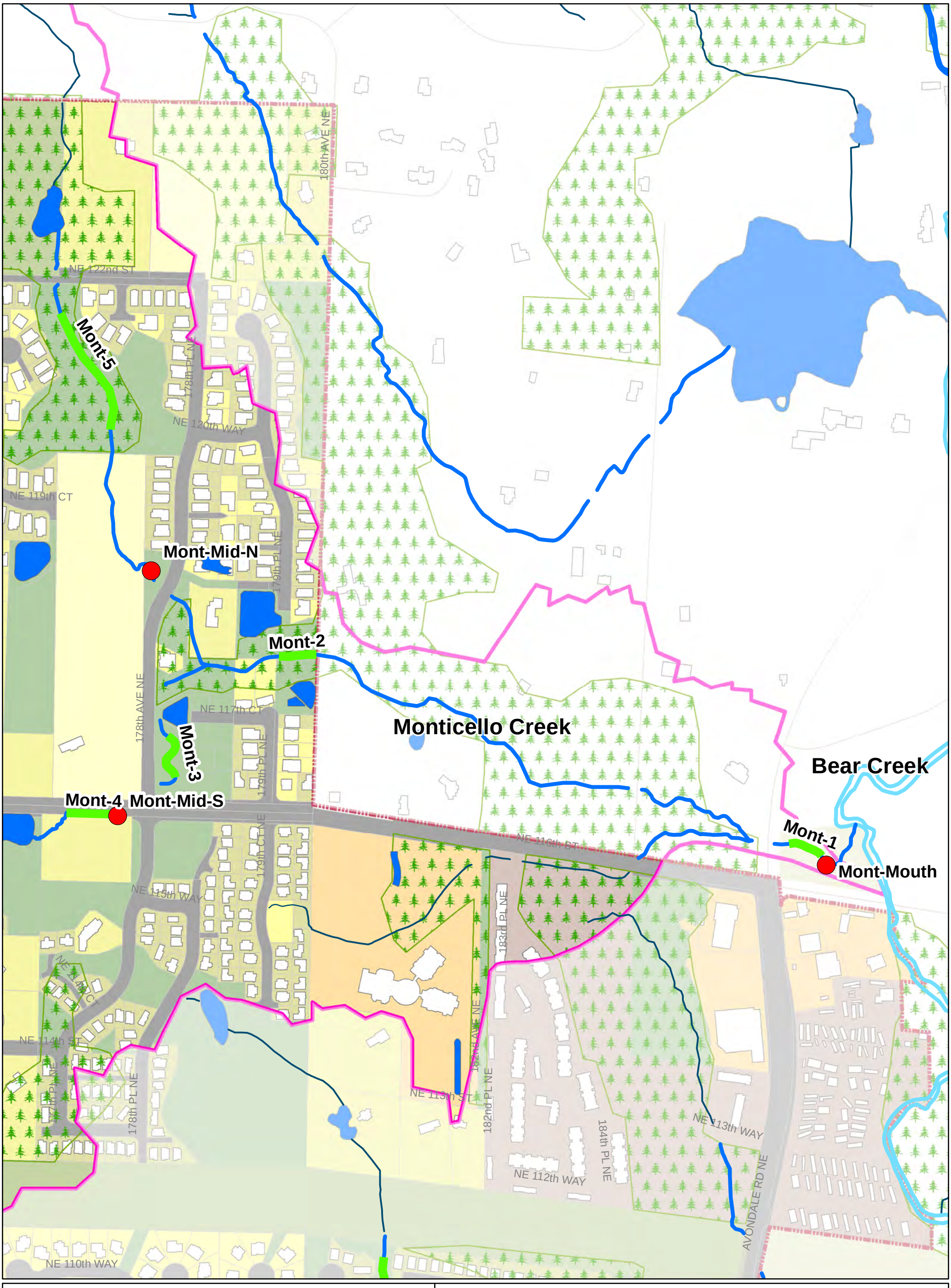

Figure 3. Monticello Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

6/25/2015

N

0 0.0375 0.075 0.15 Miles

CityofRedmond WASHINGTON

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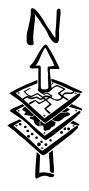
Legend

- Class I Stream
- Class II Stream
- Class III Stream
- Class IV Stream
- Ponds
- City Limits
- Watershed Boundary
- Commercial
- Industrial
- Multifamily
- Park / Undeveloped
- Public ROW
- Single Family HighDensity
- Single Family Low Density
- Single Family Medium Density
- Single Family Rural Density
- Flow & WQ Monitoring
- Habitat, Sediment & Biological Monitoring

Figure 4. Tosh Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

11/22/2013



0 0.0375 0.075 0.15 Miles

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- Public ROW
- Single Family HighDensity
- Single Family Low Density
- Single Family Medium Density
- Single Family Rural Density
- Hydrology & WQ Monitoring
- Physical Habitat, sediment & B-IBI Monitoring

Reference Watersheds

- Colin Creek: One station at the approximate midpoint of the watershed designated Colin-Mid (COLM) (see locations in Figure 5).

- Seidel Creek: One station at the approximate midpoint of the watershed on the north tributary designated Seidel-Mid-N (SEIMN); one station at the approximate midpoint of the watershed on the south tributary designated Seidel-Mid-S (SEIMS) (see locations in Figure 6).

Control Watersheds

- Country Creek: One station at the mouth designated Country-Mouth (COUMO); and one station at the approximate midpoint of the watershed designated Country-Mid (COUMI) (see locations in Figure 7).

- Tyler's Creek: One station at the mouth designated Tylers-Mouth (TYLMO); and one station at the approximate midpoint of the watershed designated Tylers-Mid (TYLMI) (see locations in Figure 8).

Continuous flow monitoring will occur at all 14 monitoring stations for the duration of the RPWS. Data from the continuous flow monitoring will be processed to calculate the following indicators for evaluating hydrologic impacts from urban development as described in DeGasperi et al. (2009):

- **High flow pulse:** Occurrence of daily average flows that are equal to or greater than a threshold set at twice (two times) the long-term daily average flow rate.
    - **High pulse count:** Number of days each water year that discrete high flow pulses occur.
    - **High pulse duration:** Annual average duration (in days) of high flow pulses during a water year.
    - **High pulse range:** Range in days between the start of the first high flow pulse and the end of the last high flow pulse during a water year.
- **Low pulse count:** Occurrence of daily average flows that are equal to or less than a threshold set at 50 percent of the long-term daily average flow rate.
    - **Low pulse count:** Number of times each calendar year that discrete low flow pulses occurred.
    - **Low pulse duration:** Annual average duration (in days) of low flow pulses during a calendar year.
    - **Low pulse range:** Range in days between the start of the first low flow pulse and the end of the last low flow pulse during a calendar year.

- **Flow Reversal:** The number of times that the flow rate changed from an increase to a decrease or vice versa during a water year. Flow changes of less than 2 percent are not considered.

- **Richards-Baker (RB) flashiness index:** A dimensionless index of flow oscillations relative to total flow based on daily average discharge measured during a water year.

- **Flashiness ($T_{Q\ Mean}$):** The fraction of a year that mean daily discharge exceeds annual mean discharge.

- **Storm flow volume:** Total discharge volume during storm events over a water year.

- **Base flow volume:** Total discharge volume during base flow over a water year.

- **Total flow volume:** Total discharge volume over a water year.

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Statistical significance of the correlation coefficients will be evaluated based on an α-level of 0.05 for a one-tailed test. The pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while these same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

In addition to the correlation analyses, separate analyses will be performed to compare measured flows in Tosh Creek and Monticello Creek to modeled flows for forested and existing conditions in these watersheds that were derived using Hydrological Simulation Program—Fortran (HSPF) models. Evans Creek was not included because there is not a pre-existing HSPF model for Evans Creek. For these analyses, local rainfall data collected concurrently with the measured flows will serve as model input for predicting flows for forested and existing conditions. Using a custom program that is described in the QAPP for the study (Herrera 2015c), both the measured and modeled flows will be post-processed to delineate individual periods of base and storm flow, respectively, across the entire time series for a given water year. Separate statistical analyses (Paired Wilcoxon signed rank tests or Paired T-tests) will then be performed to determine if measured peak flows and flow volumes, respectively, during storm flow are significantly different from modeled flows for either the forested or existing conditions. Statistical significance in these tests will be evaluated based on an α-level of 0.05 for a one-tailed test. If watershed rehabilitation efforts are effective, measured peak flows and flow volumes should depart from the modeled equivalent for existing conditions and more closely resemble those for forested conditions.

Colin Creek

Colin-1

Colin-Mid

Redmond Watershed Preserve Park

Figure 5. Colin Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

6/25/2015

N

0 0.0325 0.065 0.13 Miles

CityofRedmond
WASHINGTON

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- Park / Undeveloped
- Public ROW
- Single Family HighDensity
- Single Family Low Density
- Single Family Medium Density
- Single Family Rural Density
- Flow & WQ Monitoring
- Habitat, sediment & Biological Monitoring

Seidel-1

Seidel-2

Seidel-Mid-N

Seidel Creek

Redmond Watershed Preserve Park

Seidel-3

Seidel-Mid-S

Figure 6. Seidel Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

11/22/2013

N

CityofRedmond
WASHINGTON

0 0.05 0.1 0.2 Miles

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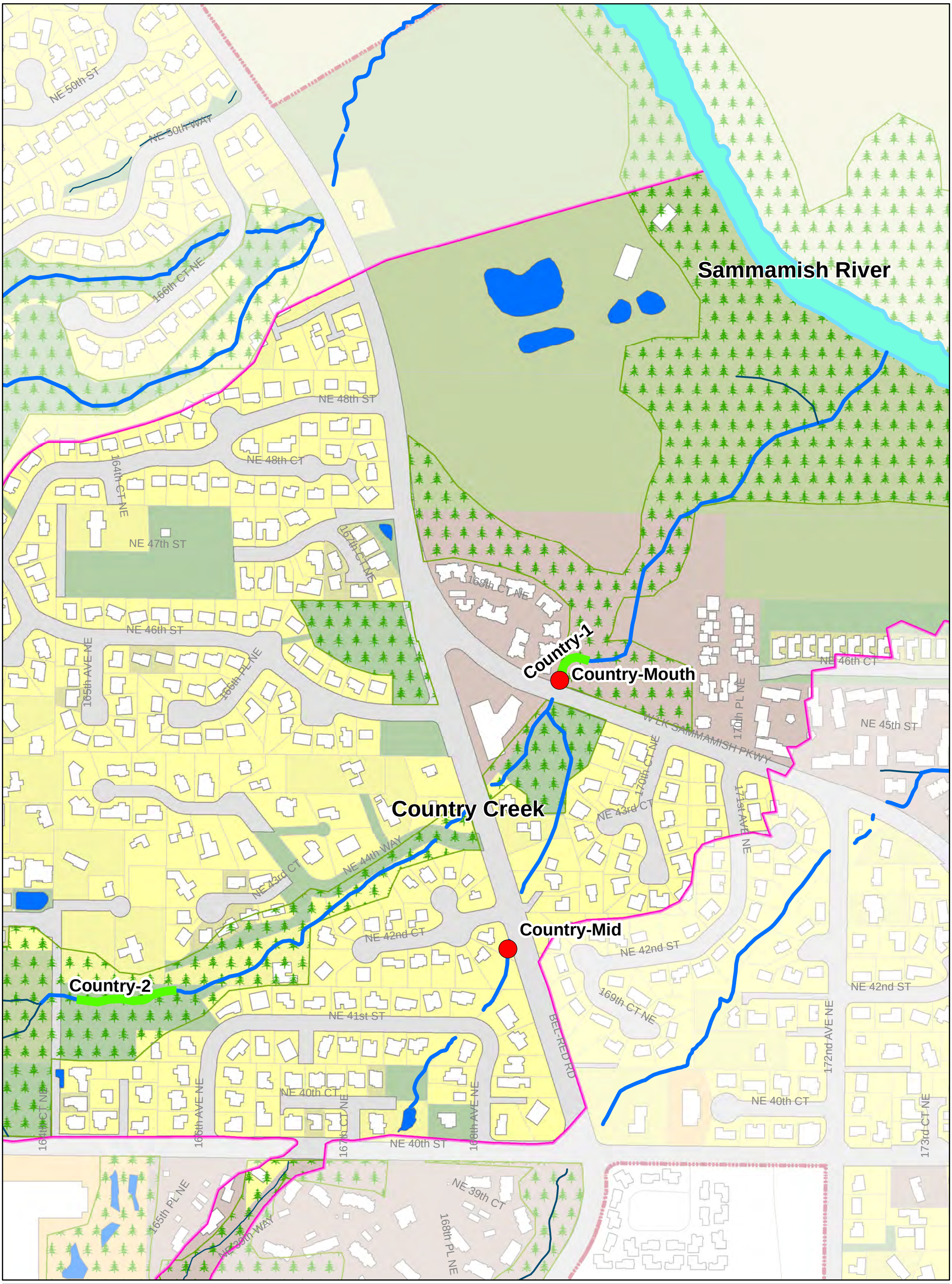

Figure 7. Country Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

6/25/2015

N

0 0.0325 0.065 0.13 Miles

CityofRedmond

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- Single Family Low Density
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- Single Family Rural Density
- Flow & WQ Monitoring
- Habitat, Sediment, & Biological Monitoring

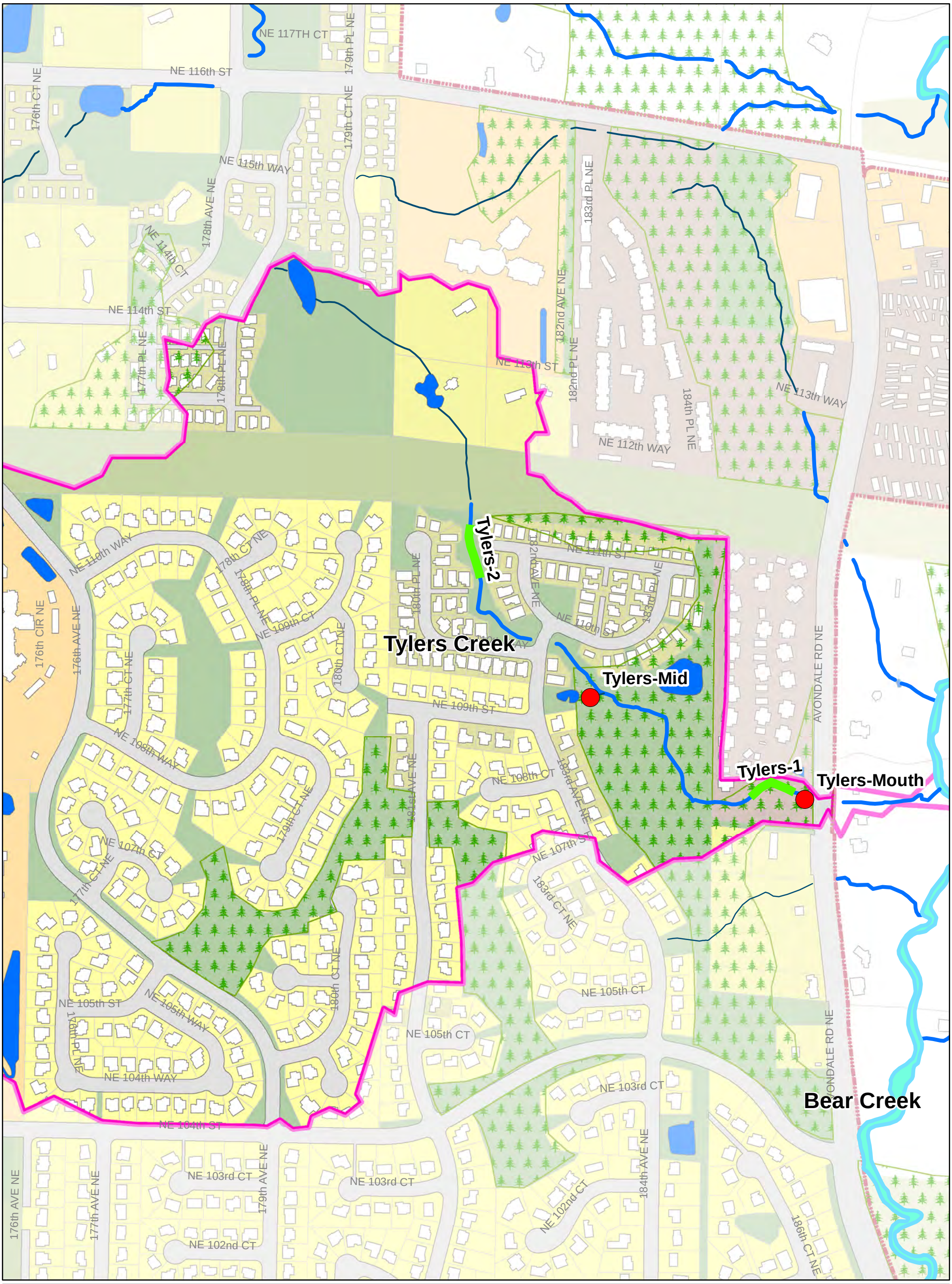

Figure 8. Tyler's Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

6/25/2015

N

0 0.0375 0.075 0.15 Miles

CityofRedmond WASHINGTON

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- Public ROW
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- Single Family Low Density
- Single Family Medium Density
- Single Family Rural Density
- Flow & WQ Monitoring
- Habitat, Sediment & Biological Monitoring

Water Quality Monitoring

A total of 14 fixed monitoring stations were established to facilitate water quality monitoring in each of the study watersheds. These stations were co-located with the monitoring stations described above for hydrologic monitoring (see Figures 2 through 8). Twelve grab samples will be collected annually during storm events (three each quarter) at each of the 14 monitoring stations for the duration of the RPWS. In addition, four grab samples will also be collected annually during base flow (one each quarter) at these stations. Each sample will be analyzed for the following indicators for evaluating water quality impacts from urban development:

- Total suspended solids
- Turbidity
- Conductivity
- Hardness
- Dissolved organic carbon
- Fecal coliform bacteria
- Total phosphorus
- Total nitrogen
- Copper, total and dissolved
- Zinc, total and dissolved

In addition, *in situ* probes will be used to continuously measure temperature at each station and conductivity at the following subset of stations: EVALSS, EVAMS, MONM, MONMS, TOSMO, SEIMN, SEIMS, COUMO, and TYLMO.

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Where possible, variation in the indicator data related to changes in stream flow will be removed prior to performing the correlation analyses using methods described in Helsel and Hirsch (2002). Use of these methods is generally applicable for indicators that tend to increase (or decrease) as a function of flow (e.g., total suspended solids). By removing this variation, trends in the indicator data can be more readily detected in the correlation analyses. In all cases, statistical significance of the correlation coefficients will be evaluated based on an α-level of 0.05 for a one-tailed test.

The sample frequency identified above for water quality monitoring was evaluated using power tests that were performed for totals suspended solids and total zinc. Power tests are used to determine the probability of detecting a trend given: 1) sample size, 2) the desired α-level, 3) magnitude of the trend, and 4) amount of variation within the data. With 16 samples collected annually (12 samples during storm events and 4 samples during base flow) over a 10-year period and a desired α-level of 0.05, results from these tests showed there was a 66 to 100 percent probability of detecting a 4 milligram per liter (mg/L) decrease in total suspended solids concentrations depending on the variability that is assumed for the data and characteristics of the trend over time (i.e., linear or non-linear). These same tests showed there is a 38 to 100 percent probability of detecting a 2 microgram per liter (µg/L) decrease in total zinc concentrations. Results from these tests are documented in the QAPP that was prepared for the study (Herrera 2015c).

Annual mass load estimates will also be derived for the following subset of indicators using the nonparametric "smearing" approach described in Helsel and Hirsch (2002): total suspended solids, total phosphorus, total nitrogen, total copper, and total zinc. Trends over time at each monitoring station will again be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these mass load estimates and time. Statistical significance of the correlation coefficients will be evaluated based on an α-level of 0.05 for a one-tailed test. These analyses will be used to detect potential improvements in receiving water conditions from the combined effects of improved water quality and reduced stormwater runoff.

In all cases, the pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

Physical Habitat Monitoring

A total of 19 fixed monitoring stations were established to facilitate physical habitat monitoring in each of the study watersheds. As described in the literature review (Herrera 2015b) that was performed to inform the experimental design for the RPWS, most past studies that have been performed to assess physical habitat response to watershed rehabilitation were conducted in reaches where channel rehabilitation measures were directly applied. Consequently, they were designed to only assess the localized effects of these efforts. The RPWS involves both localized channel rehabilitation and watershed scale rehabilitation through the application of structural and programmatic practices for stormwater management. Therefore, a synoptic approach was applied for establishing monitoring stations for physical habitat monitoring where stations were established in the Application watersheds in reaches that will be restored and in reaches where no physical alterations to the channel are planned. In this way, the RPWS can assess physical habitat response to both localized and basin-wide rehabilitation efforts. In addition to these considerations, the specific location of each monitoring station was also influenced by safety

and property access issues. The monitoring stations established in each of the study watersheds are as follows:

Application Watersheds

- Evans Creek Tributary 108: Two stations designated Lower Stream Station (EVALSS) and Midstream Station (EVAMS), respectively (see locations in Figure 2).
- Monticello Creek: Five stations designated Mont-1, Mont-2, Mont-3, Mont-4, and Mont-5, respectively (see locations in Figure 3).
- Tosh Creek: Four stations designated Tosh-1, Tosh-2, Tosh-3, and Tosh-4, respectively (see locations in Figure 4).

Reference Watersheds

- Colin Creek: One designated Colin-1 (see locations in Figure 5).
- Seidel Creek: Three stations designated Seidel-1, Seidel-2, and Seidel-3, respectively (see locations in Figure 6).

Control Watersheds

- Country Creek: Two stations designated Country-1 and Country-2, respectively (see locations in Figure 7).
- Tyler's Creek: Two stations designated Tylers-1 and Tylers-2, respectively (see locations in Figure 8).

The following monitoring stations were specifically selected to measure the localized physical habitat response in reaches that have either been recently restored or are likely to be restored in the future:

- Mont-3
- Mont-4
- Mont-5
- Tosh-1
- Tosh-3
- Tosh-4

Physical habitat monitoring will be conducted annually at each monitoring station for the duration of the RPWS. The characteristic bed-form type will be recorded at each monitoring station, and physical habitat quality indicators will be measured at 11 cross-sections (transects) and thalweg (line of steepest descent along the streambed) profile for each habitat monitoring station.

The following indicators will be measured at each transect:

- Bankfull width, wetted width, and cumulative bar width
- Bankfull depth, wetted depth, substrate class and embeddedness at 11 or more stations across the section
- Fish cover
- Human influence
- Riparian shading
- Riparian vegetation structure
- Presence of desirable/undesirable plant species

The following indicators will be measured along the thalweg profile:

- Thalweg depth and the presence of bars and/or edge pools
- Large woody debris and habit unit descriptions
- Side-channel descriptions
- Main channel slope and bearing
- Presence, source, size, of culvert or pipes draining to creek

Post-processing of recorded physical habitat indicators will allow monitoring of:

- Channel incision or aggradation
- Channel widening, narrowing, or migration
- Changes in channel slope, sinuosity, and/or bed-form type

The pattern of interest will be evidence that receiving water conditions are improving based on the detection of trends in the data for one or more of these indicators in the Application watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

Sediment Quality Monitoring

A total of 19 fixed monitoring stations were established to facilitate sediment quality monitoring in each of the study watersheds. These stations were co-located with the monitoring stations described above for physical habitat monitoring (see Figures 2 through 8). Sediment samples will be collected annually at all 19 monitoring stations for the duration of the RPWS. Each sample will be analyzed for the following indicators for evaluating sediment quality impacts from urban development:

- Total organic carbon
- Copper
- Zinc
- Polycyclic aromatic hydrocarbons
- Phthalates

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Statistical significance of the correlation coefficients will be evaluated based on an α-level of 0.05 for a one-tailed test. The pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

Biological Monitoring

A total of 19 fixed monitoring stations were established to facilitate biological monitoring in each of the study watersheds. These stations were co-located with the monitoring stations described above for physical habitat monitoring (see Figures 2 through 8). Benthic macroinvertebrate samples will be collected annually at each monitoring station for the duration of the RPWS. Each sample will be processed to calculate the following indicators for use in evaluating stream health:

- Benthic Index of Biotic Integrity (B-IBI)
- Taxa Richness
- Ephemeroptera Richness
- Plecoptera Richness

- Trichoptera Richness
- Clinger Percent
- Long-Lived Richness
- Intolerant Richness
- Percent Dominant
- Predator Percent
- Tolerant Percent

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Statistical significance of the correlation coefficients will be evaluated based on an α-level of 0.1 for a one-tailed test. The pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

The sampling frequency identified above for biological monitoring was evaluated using the power tests described above in the *Water Quality Monitoring* subsection. With samples collected annually over a 10-year period and a desired α-level of 0.05, results from these tests showed there was a 63 to 96 percent probability of detecting a 9-unit increase in B-IBI scores (equivalent to a change from "fair" to "good" in biological condition) depending on the variability that is assumed for the data and characteristics of the trend over time (i.e., linear or non-linear). Results from these tests are documented in the QAPP that was prepared for study (Herrera 2015c).

Effectiveness Monitoring

As described above, roving stations will be established for the Effectiveness Monitoring component of the RPWS to verify specific structural stormwater controls are constructed properly and performing as designed. The roving stations will be moved from one year to the next once a facility's effectiveness has been verified and new facilities come online. The specific types of monitoring to be performed at each roving station will depend on the type of structural stormwater control that is being evaluated. For example, it is anticipated that only hydrologic monitoring would be performed at roving stations for facilities that are only designed for flow control (e.g., vaults). In these cases, a facility's performance would be verified based on comparisons of measured flow from the roving station to the facility's predicted flow from models used in its design. For facilities that are designed for runoff treatment, monitoring will follow guidelines from Ecology's Technology Assessment Protocol-Ecology (TAPE) (Ecology 2011) and include both hydrologic (e.g., influent and effluent flow) and water quality monitoring.

In these cases, a facility's performance would be verified based on comparisons of its measured pollutant removal efficiency relative to targets that are identified in TAPE for specific treatment categories.

At present, no new structural stormwater controls have come online in an Application watershed that are suitable for Effectiveness Monitoring. For planning purposes, it is anticipated that two separate facilities will be completed and made available for monitoring in year 6 of the study, respectively. For each facility, detailed information on the procedures that will be used for data collection, quality assurance and control, management, and analysis will be provided in separate addendums to the QAPP that was prepared for the study (Herrera 2015c).

REHABILITATION EFFORT SUMMARY

As noted in the previous section, the pattern of interest for this study will be evidence that receiving water conditions are improving based on one or more indicators in the Application watersheds while conditions in the Reference and Control watersheds remain relatively static. To increase the likelihood of detecting this trend, conditions in the Application watersheds were characterized over a "baseline" period prior to the implementation of any rehabilitation efforts that generally spanned WY2016. Rehabilitation efforts that have subsequently been implemented by the City or County in each of the Application watersheds are described below.

Evans Creek Tributary 108:

- In WY2017, the County constructed two stormwater detention vaults within the Evans Creek Tributary 108 watershed; one was in front of addresses 20620 and 20626 NE 76th Place, and the other was in front of address 20508 NE 78th Street.

- No rehabilitation efforts have been conducted in WY2019.

Monticello Creek:

- Using funding from a King County WaterWorks grant, the City initiated a street sweeping project in the Monticello Creek watershed:

    - Street sweeping increased from quarterly to monthly in August of WY2017 and continued throughout WY2018. The street sweeping occurred on all public roads in the watershed.

    - Beginning in October of WY2019, the frequency of street sweeping increased from once per month to biweekly. This street sweeping was implemented to meet the specific goal of improving water quality in the creek and conducted in addition to street sweeping that occurs in the watershed for other operational reasons, such as collecting leaves in fall.

    Note: In March 2020, Herrera completed the Monticello Basin Street Sweeping Water Quality Trend Analysis (Herrera 2020) and observed a decrease in particulate copper and total suspended solids (TSS) concentrations collected during storm events. Because there are several variables and changes in the Monticello Creek basin that could affect water quality, it is difficult to confirm that this trend was directly related to the street sweeping. There was also a significant decrease in storm event total phosphorus (TP) at all Monticello Creek sites after sweeping was increased from quarterly to monthly, but concentrations increased during the biweekly sweeping period, so there was no overall significant TP trend. Trends identified through this analysis will be reevaluated and compared with results

from other watersheds in connection with the year 4 Trend Analysis Report described in the Introduction to this document.

- In WY2017, large woody debris was installed on an approximately 400-foot-long reach of Monticello Creek that extends downstream from Northeast 122nd Street. Approximately 400 feet of additional large woody debris was installed in July of WY2018 on the downstream end of the installation from WY2017.

- In WY2019, invasive species removal and supplemental planting was completed in an approximately 2,000-square-foot project area located at the Fischer Village native growth protection easement downstream of 178th Avenue Northeast. Fifty-five trees and 15 shrubs were planted. Himalayan blackberry (*Rubus armeniacus*) was removed from the project area.

Tosh Creek:

- The high flow bypass pipe weir for the Tosh Creek watershed was adjusted in July of WY2017 to divert more high flow stormwater from Tosh Creek.

- Large woody debris was installed on an approximately 300-foot-long reach of Tosh Creek in WY2017, downstream of West Lake Sammamish Parkway. In July of WY2018, adjustments were made to this large woody debris and minor slash was added to the reach.

- In WY2019, a planting was conducted in an approximately 40,000-square-foot project area located in the lower section of Tosh Creek, between West Lake Sammamish Parkway and the Sammamish River. Sixty-five shrubs and 627 trees were planted. Normal maintenance was performed at the site, including removal of the invasive species Himalayan blackberries and bittersweet nightshade (*Solanum dulcamara*).

SAMPLING PROCEDURES

The QAPP that was prepared for the RPWS (Herrera 2015c) provides detailed information on the sampling procedures that are being used for each of the following monitoring categories: hydrologic, water quality, physical habitat, sediment quality, and biological. The following deviations from these sampling procedures are noted for monitoring that took place in WY2019:

- The YSI Pro Model 2030 that was used to make discrete *in situ* measurements of water temperature and conductivity was calibrated using a 1,000 µS standard instead of a 100 µS standard as specified in the QAPP. This change was made based on manufacturer recommendations for meter calibration. Given this change, the calibration of the meter was subsequently checked before and after each sampling event using both the 100 and 1,000 µS standards to confirm the method quality objective identified in the QAPP for meter accuracy (±5 percent) was met. Results from these calibration checks were documented on standardized field forms.

- Guidelines in the QAPP indicated storm sampling should occur after a period of at least 24 hours preceding the event with less than 0.04 inch of precipitation. However, this guideline was deemed too restrictive following monitoring that occurred over WY2016. Based on input from the SAM program coordinator and technical advisory committee for the RPWS, this criterion was changed to allow storm event sampling after a period of at least 12 hours preceding the event with less than 0.04 inch of precipitation.

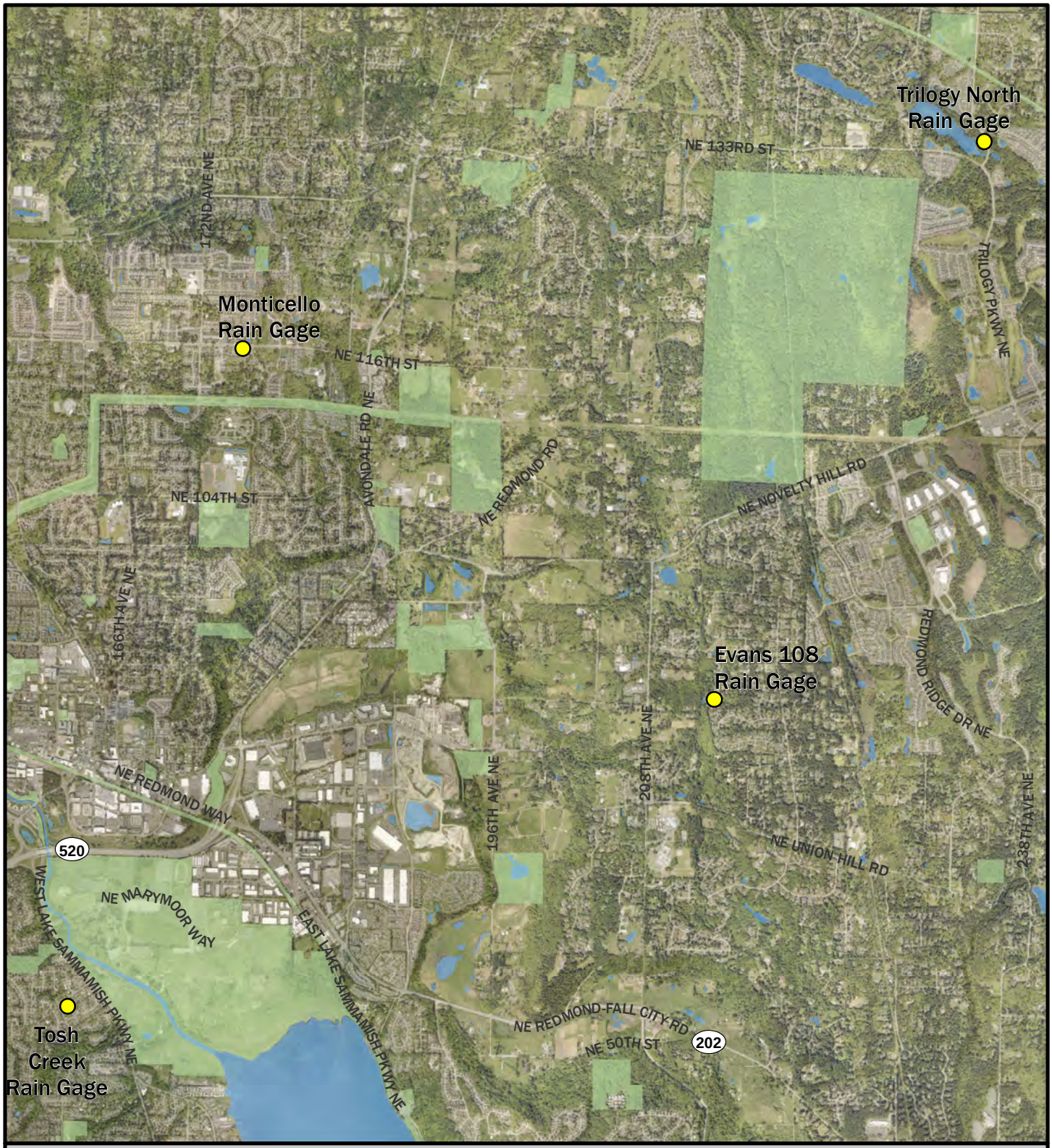
MONITORING RESULTS SUMMARY

This section summarizes results for the Status and Trends Monitoring component of the RPWS from monitoring that was conducted over WY2019; as noted previously, no monitoring for the Effectiveness Monitoring component of the study occurred over this period. The presentation of these results is organized under separate subsections for the following monitoring categories: hydrologic, water quality, physical habitat, sediment quality, and biological. As noted in the *Introduction* section of this document, trend analyses reports will be prepared in years 4, 6, 8, and 10 of the RPWS' implementation to summarize the results of statistical analyses that will be performed on the compiled data from all previous years of monitoring to detect potential relationships between rehabilitation efforts and improved receiving water conditions. Therefore, this data summary report does not provide detailed analyses of the monitoring results from WY2019. The year 4 Trend Analysis Report will be prepared in 2020 following this WY2019 Data Summary Report.

HYDROLOGIC MONITORING

Hydrologic monitoring for WY2019 initiated on October 1, 2018, at the 14 fixed monitoring stations that are identified in the *Experimental Design* section of this document and continued through September 30, 2019. In addition, continuous precipitation monitoring occurred over the same period at four separate precipitation monitoring stations: three stations were established for the RPWS – Tosh, Monticello, and Evans; and one station is maintained by the County for other purposes – Trilogy (Figure 9). Each station is used for measuring precipitation in the watershed for a specific creek as follows:

- Tosh station: Tosh Creek and Country Creek
- Monticello station: Tyler Creek and Monticello Creek
- Evans station: Evans Creek
- Trilogy station: Seidel Creek and Colin Creek.



Legend

- Precipitation Monitoring Stations
- Water body
- Park

Figure 9.
Redmond Paired Watershed Precipitation Monitoring Locations.

N

0 1,825 3,650 7,300 Feet

HERRERA

King County Aerial (2019)

K:\Projects\Y2014\14-05806-000\Project\Report\Figure9_PrecMonitorLoc_RPWP.mxd (5/4/2020)

Line plots showing the continuous flow and precipitation data collected at each of these stations (grouped by watershed) are provided in Appendix A. The quality assurance review memorandum for these data is provided in Appendix B, while Appendix C documents the discharge rating tables that were used to estimate flow at each station. The quality assurance review memorandum summarizes the results of the quality assurance review of hydrologic data collected for the 2019 calendar year. To be consistent with the WY2019 data presented in this report, results are summarized herein for the water year (October 2018 through September 2019) and includes information from both the quality assurance review memoranda that were prepared for the 2018 and 2019 calendar years. In general, the quality assurance review memorandum indicates there were no serious quality assurance problems associated with these data that would impose severe limitations on their use and interpretation. As documented in the quality assurance review memorandum, the continuous flow data at each station was rated as either "fair" or "good" with the following exceptions:

- COLM: Fair to poor record. Most data for this station is rated as fair except for February 12, 2019, to February 26, 2019, which is rated as poor during a period of heavy snow. There were periods of no flow from July 22, 2019, to September 14, 2019.

- COUMI: Poor record. Section control was very unstable, especially in September 2019. Data from July 16, 2019, to July 23, 2019, was collected in 15-minute intervals using U20 because the CS451 probe had poor readings due to sediment accumulation. Corrected records for a few periods during spring/summer where discharge at COUMI was greater than COUMO to reflect greater flow at COUMO.

- COUMO: Fair to poor record. There were some small fluctuations in data caused gravel and debris around the sensor, but larger data shifts were limited. A number of data shifts occurred after September 24, 2019, due to leaves and debris on the control. The data record was corrected over a few periods during spring/summer when discharge at COUMI was greater than COUMO to reflect greater flow at COUMO.

- MONMN: Fair to poor record. Some oddly dampened storm peaks were observed from mid-June 2019 to mid-August 2019 relative to other Monticello stations, perhaps due to stormwater controls or diversion from construction in the watershed.

- SEIMN: Fair to poor record. A substantial amount of debris was cleared from the station on January 15, 2019, and rating was shifted to account for change in stage/discharge relationship. Larger rating shifts were applied during wet seasons to account for gravel on weir ramp.

- TYLMI: Poor record. The natural control was unstable with several shifts occurring due to debris and scour/deposition. The storm hydrograph appears muted compared to TYLMO, which generally looks flashier. The data record was corrected for periods where baseflow was greater at TYLMI than baseflow at TYLMO. The discrepancy between baseflow records may be due to low sensor resolution with low flows in the stream (less than 0.1 cubic foot per second).

Finally, there were minor gaps in the continuous flow data at COUMI, SEIMS, and TOSMI as shown in Table 3.

Table 3. Gaps in Continuous Flow Data.[a]

Station	Gap Start Date, Time[b]	Gap Stop Date, Time[b]	Gap Duration in Hours	Flow Estimation Method
COUMI	7/16/19, 11:15	7/23/19, 15:00	0.2[c]	Fill data gaps in 15-minute data with linear resample rate of 5.0 minutes.
SEIMS	4/5/19, 10:40	10/31/19, 13:15	0.2[c]	Fill data gaps in 15-minute data with linear resample rate of 5.0 minutes.
TOSMI	2/12/19, 06:00	2/24/19, 11:00	293	Scaled data from TOSMO.

[a] Gaps in data reported for the water year (October 1, 2018, through September 30, 2019).

[b] All times are reported as Pacific Standard Time.

[c] 15-minute data from backup sensor used during this period.

To facilitate future analyses of hydrologic trends, the gaps identified in Table 3 were filled using estimated flow data. These estimates were derived by first importing the continuous flow data from all stations into the AQUARIUS Time-Series software package (AQUARIUS). Using AQUARIUS' built-in data correction capabilities, gaps in 15-minute backup sensor data at COUMI and SEIMS were filled using linear resampling to generate continuous 5-minute timeseries data. The longer gap at TOSMI was filled using models that were developed to estimate missing flow data for one station based on measured flow data from another station having a similar hydrograph form and response. Specifically, AQUARIUS was used to copy and adjust the hydrograph from one station with no gap to another with a gap. After the data were copied, adjustments were made to scale the data appropriately.

Once a complete data record was available for all the stations using either estimated or measured flow, the continuous flow data from each station and the applicable precipitation data were post-processed using a custom program written in Visual Basic that delineates the start and stop time of individual storm events based on user selectable storm criteria (e.g., antecedent dry period, minimum rainfall, interevent dry period, etc.). The program then computes the following suite of summary statistics for each storm event:

- Precipitation start and stop times
- Precipitation duration
- Precipitation depth
- Precipitation average intensity
- Precipitation maximum intensity
- Precipitation antecedent dry period

- Flow start and stop times
- Flow duration
- Average flow rate
- Maximum flow rate
- Flow volume

Appendix D provides these summary statistics for the individual storm events that were delineated based on the continuous flow data from each station. Summary statistics computed across all the events for each station are provided in Table 4.

Table 4. Summary Statistics for Storm Events by Monitoring Station.

Station	Watershed Type	Median Average Flow Rate (cfs)	Maximum Flow Rate (cfs)	Median Flow Volume (cf)	Maximum Flow Volume (cf)
EVALSS	A	2.23	6.63	166,386	608,102
EVAMS	A	0.68	2.58	51,394	159,837
MONM	A	1.28	13.83	103,326	585,024
MONMN	A	0.42	6.25	34,830	209,688
MONMS	A	0.16	1.67	13,021	71,901
TOSMO	A	0.88	9.60	68,427	307,092
TOSMI	A	0.54	9.36	42,269	225,587
COLM	R	0.81	4.78	58,417	450,928
SEIMN	R	0.35	1.71	26,981	167,995
SEIMS	R	0.48	3.73	37,223	143,408
COUMO	C	0.45	19.94	37,037	183,075
COUMI	C	0.14	0.74	10,805	37,629
TYLMO	C	0.57	14.94	47,312	252,075
TYLMI	C	0.29	2.33	24,275	150,198

cfs = cubic feet per second

cf = cubic feet

A = Application

R = Reference

C = Control

As described in the *Experimental Design* section of this document, data from the continuous flow monitoring are processed to calculate the following suite of thirteen indicators for evaluating hydrologic impacts from urban development:

- High pulse count
- High pulse duration

- High pulse range
- Flow reversal
- RB flashiness index

$T_{Q\ Mean}$ values for the following three indicators were derived using a hydrograph separation algorithm that has been successfully used in several other studies (Herrera 2004, 2011) for this purpose:

- Storm flow volume
- Base flow volume
- Total flow volume

The computed values for these nine of these indicators are shown in Table 5.

Table 5. Computed Indicator Values for Evaluating Hydrologic Impacts.

Station	Watershed Type	High Pulse Count (count)	High Pulse Duration (days)	High Pulse Range (days)	Low Pulse Count[a] (Count)	Low Pulse Duration[a] (days)	Low Pulse Range[a] (days)	Flow Reversal (count)	Richards-Baker Flashiness Index	TQ Mean (fraction of year)	Storm Flow Volume (cf)	Base Flow Volume (cf)	Total Flow Volume (cf)
EVALSS	A	7	1.1	135	4	3.5	91	121	0.39	0.14	7,488,209	48,070,417	55,558,626
EVAMS	A	6	1.5	135	17	4.2	210	150	0.38	0.17	2,697,925	14,187,989	16,885,914
MONM	A	12	2.2	316	25	8.0	322	114	0.31	0.36	10,927,459	12,761,327	23,688,786
MONMN	A	13	2.4	316	24	10.0	338	100	0.30	0.47	4,804,169	2,419,372	7,223,541
MONMS	A	13	1.6	316	18	11.1	260	106	0.37	0.37	1,235,730	1,758,327	2,994,057
TOSMO	A	15	1.3	317	20	4.9	214	133	0.29	0.34	5,317,793	12,430,939	17,748,732
TOSMI	A	15	1.4	164	30	6.5	317	146	0.33	0.38	3,435,653	6,604,678	10,040,331
COLM	R	7	3.0	72	5	40.8	254	83	0.40	0.20	10,739,451	6,590,500	17,329,951
SEIMN	R	4	1.5	105	9	18.2	243	101	0.42	0.14	1,331,505	7,370,013	8,701,518
SEIMS	R	2	1.0	73	16	6.2	140	135	0.41	0.15	1,696,477	10,305,518	12,001,995
COUMO	C	14	1.8	136	36	6.5	348	141	0.26	0.48	4,068,226	4,055,615	8,123,841
COUMI	C	5	2.2	135	26	5.0	286	121	0.34	0.19	704,801	2,592,469	3,297,270
TYLMO	C	16	1.7	317	32	7.5	347	122	0.30	0.57	5,409,321	3,235,851	8,645,172
TYLMI	C	17	3.1	334	29	8.5	345	107	0.25	0.61	3,171,933	1,413,996	4,585,929

[a] Indicator calculated based on data collected over the calendar year (January 1, 2019, through December 31, 2019).

cf = cubic feet

A = Application

R = Reference

C = Control

WATER QUALITY MONITORING

Pursuant to the QAPP that was prepared for the study (Herrera 2015c), 12 grab samples are to be collected during storm events (three each quarter) at the 14 fixed monitoring stations that are identified in the *Experimental Design* section of this document for water quality monitoring. In the case of events missed due to extended dry periods, Ecology and TAC approved making up storms in future years. In addition, four grab samples are to be collected during base flow (one each quarter) at these same stations. The dates when samples were collected during storm events are identified in Table 6. Eight and four storm events were sampled in the first and fourth quarters of WY2019, respectively, to make up for events that were missed in WY2016, WY2017, and WY2018 due to dry conditions. No storm events were sampled in the third quarter of WY2019 due to extremely dry conditions. Additional storm events will be sampled in water year 2020 (WY2020) to make up for these missed events.

Note that only the COLM, SEIMN, and SEIMS stations were sampled during the November 1, 2019, storm event to make up for an event missed on October 27, 2019, due to safety concerns. At the end of WY2019, all 14 stations have samples from an equivalent number of base flow events.

The following modified criteria from the QAPP (see *Sampling Procedures* section) serve as guidelines for defining the acceptability of specific storm events for sampling:

- **Target precipitation depth**: A minimum of 0.25 inch of precipitation over a 24-hour period
- **Antecedent conditions**: A period of at least 12 hours preceding the event with less than 0.04 inch of precipitation

Table 6 compares these criteria to data collected in WY2019 during each sampled storm event from the precipitation monitoring stations described in the previous section (Tosh, Monticello, Evans, and Trilogy). As shown, these criteria were met for all storm events sampled over WY2019 except the September 17, 2019, event; the antecedent dry period at EVAMS and EVALSS was only 6.6 hours for this event.

To provide additional information for assessing the acceptability of sampled storm events, line plots showing the actual time samples were collected at each station relative to the storm event hydrograph are provided in Appendix E; storm event hydrographs in these plots are shaded grey to distinguish them from periods of base flow. These plots show that most samples were collected early on the rising limb or peak of the hydrograph with the following exceptions:

- During the storm event on October 25, 2018, samples were collected after rainfall was observed but before there was an appreciable rise in the hydrograph at EVAMS, EVALSS, MONMN, MONMS, COUMO, COUMI, TYLMI, and TYLMO.
- During the storm event on December 17, 2018, samples were collected after rainfall was observed but before there was an appreciable rise in the hydrograph at EVAMS, EVALSS, TOSMI, TOSMO, and COUMO.

- During the storm event on September 17, 2019, samples were collected after rainfall was observed but before there was an appreciable rise in the hydrograph at EVAMS and EVALSS.
- During the storm event on September 22, 2019, samples were collected after rainfall was observed but before there was an appreciable rise in the hydrograph at EVAMS, EVALSS, MONMN, and COLM.

The representativeness of the data from these samples for assessing water quality during storm events will be more thoroughly assessed prior to their use in trend analyses for the study. If necessary, they may be reclassified as base flow samples for these analyses to avoid introducing bias in the associated results. In all cases, they will be used with extreme caution. In WY2020, field protocols will be revised to sample stations in the Evans Creek watershed later in the storm event to ensure an appreciable rise in the hydrograph has occurred from inputs of stormwater.

As described in the QAPP for the RPWS (Herrera 2015c), base flow samples should be collected following a period of at least 48 hours without rain. Table 6 shows the dates when samples were collected during base flow with a comparison to this criterion using data from the precipitation monitoring stations described in the previous section. This comparison shows the criterion was met during all base flow sampling events.

Field data collection forms, chain-of-custody records, laboratory reports, and data quality audit forms from the storm event and base flow sampling during WY2019 are provided in Appendix F. The memorandum documenting results from the quality assurance review that was performed on these data is provided in Appendix G. Based on this review, 14 values were qualified as estimates as documented in Table 7, and no values were rejected. The majority of the qualified values were related to field duplicates that did not meet the criteria established in the QAPP (Herrera 2015a). Estimated values will be used with caution in subsequent trend analyses that will be performed for the study.

Appendix H presents tables with the following summary statistics for pollutant concentrations measured in storm event and base flow samples over WY2019:

- N (sample size)
- Minimum
- 25th Percentile
- Median
- 75th Percentile
- Maximum
- Quartile range
- Percent detected
- Percent exceeding the water quality standard for surface waters of the state of Washington (Ecology 2016), where applicable

Table 6. Sampling Dates and Comparison to Criteria for Storm Event and Base Flow Sampling.

Water Year Quarter	Event Type	Event Date	Tosh Station[a]			Monticello Station[b]			Evans Station[c]			Trilogy Station[d]		
			Precipitation Duration (hour)	Precipitation Depth[e] (inch)	Antecedent Dry Period[f] (hour)	Precipitation Duration (hour)	Precipitation Depth[e] (inch)	Antecedent Dry Period[f] (hour)	Precipitation Duration (hour)	Precipitation Depth[e] (inch)	Antecedent Dry Period[f] (hour)	Precipitation Duration (hour)	Precipitation Depth[e] (inch)	Antecedent Dry Period[f] (hour)
1	Base	10/16/2018	NA	NA	178.6	NA	NA	173.5	NA	NA	175.6	NA	NA	171.2
1	Storm	10/25/2018	25.4	0.88	387.1	25.5	0.78	385.1	26.1	0.89	36.9	26.6	0.82	36.6
1	Storm	10/27/2018[g]	15.3	1.27	30.6	19.8	1.22	34.2	15.1	1.37	30.7	NA	NA	NA
1	Storm	11/1/2018[h]	NA	NA	NA	NA	NA	NA	NA	NA	NA	19.2	0.44	17.2
1	Storm	11/26/2018	26.0	1.38	56.2	26.1	1.50	61.3	26.3	1.35	60.8	25.8	1.20	62.0
1	Storm	12/9/2018	11.4	0.64	203.8	16.8	0.66	204.1	11.5	0.69	204.2	14.5	0.73	190.2
1	Storm	12/11/2018	21.4	0.53	16.1	19.0	0.61	31.8	21.2	0.66	16.3	21.1	0.57	31.2
1	Storm	12/17/2018	15.3	0.59	19.2	14.8	0.53	19.8	14.9	0.57	19.9	14.9	0.52	19.6
1	Storm	12/28/2018	16.8	0.67	26.8	16.5	0.72	26.1	14.2	0.80	28.5	16.1	0.82	30.2
2	Base	1/15/2019	NA	NA	116.8	NA	NA	118.2	NA	NA	124.0	NA	NA	119.7
2	Storm	1/22/2019	19.9	0.82	71.9	20.0	0.85	88.3	20.0	1.00	72.3	20.1	1.00	87.9
2	Storm	2/1/2019	17.3	0.66	212.5	17.1	0.64	212.8	16.6	0.69	212.5	16.8	0.67	213.0
2	Storm	3/11/2019	26.9	1.17	80	26.9	1.28	79.5	26.6	1.35	80.4	23.5	1.17	80.2
3	Base	4/26/2019	NA	NA	93.1	NA	NA	87.7	NA	NA	92.2	NA	NA	88.2
4	Storm	7/10/2019	21.3	0.30	47.6	17.9	0.25	157.4	21.5	0.54	158.2	21.3	0.32	159.0
4	Storm	9/15/2019	15.0	0.64	46.3	18.0	0.68	46.4	16.3	0.83	46.4	16.3	0.88	46.4
4	Storm	9/17/2019	26.3	0.72	40.5	27.8	0.63	13.6	22.3	0.82	**6.6**	18.3	0.74	44.5
4	Base	9/20/2019	NA	NA	49.7	NA	NA	55.5	NA	NA	58.2	NA	NA	54.8
4	Storm	9/22/2019	17.2	0.38	97.8	18.5	0.54	90.9	18.3	0.51	101.1	20.0	0.51	105.2

[a] Station is used for measuring precipitation in the watersheds for Tosh Creek and Country Creek.

[b] Station is used for measuring precipitation in the watersheds for Tyler Creek and Monticello Creek.

[c] Station is used for measuring precipitation in the watershed for Evans Creek.

[d] Station is used for measuring precipitation in the watersheds for Seidel Creek and Colin Creek.

[e] Criteria for precipitation total is ≥0.25 inch in 12 hours for storm event sampling.

[f] Criteria for antecedent dry period is ≥12 hours with <0.04 inch of rain for storm event sampling and ≥48 hours with no rain for base flow sampling.

[g] Colin and Seidel Creeks were not sampled during this event so data from the corresponding Trilogy rain gauge is not reported.

[h] Only Colin and Seidel Creeks were sampled for this event so data is only reported for the corresponding Trilogy rain gauge.

NA = not applicable

Bold values indicate events that did not meet criteria for storm event or base flow sampling.

Table 7. Qualified Results from Discrete Water Quality Sampling.				
Event Date	**Station**	**Water Quality Indicator**	**Reason for Qualification**	**Data Flag**
10/25/18	MONMN	Turbidity	Field duplicate exceedance	J
10/27/18	All locations	Fecal coliform bacteria	Holding time exceedance	J
10/27/18	TOSMO	TSS, turbidity, TP and TKN	Field duplicate exceedance	J
11/26/18	TYLMO	TSS, turbidity, hardness, TP, TKN, total copper, and total zinc	Field duplicate exceedance	J
12/11/18	SEIMS	Turbidity	Field duplicate exceedance	J
12/11/18	SEIMS	Dissolved copper	Low matrix spike recovery	UJ
12/17/18	COUMI	Turbidity	Field duplicate exceedance	J
12/28/18	EVALSS	Fecal coliform bacteria	Field duplicate exceedance	J
2/01/19	COUMI, COUMO, MONMS, TOSMI, TOSMO, TYLMI, TYLMO	Dissolved copper	Filter blank exceedance	J
3/11/19	COUMI, COUMO, MONMS, MONMN, MONM, TOSMI, TOSMO, TYLMI, TYLMO	Dissolved copper	Transfer blank exceedance	J
3/11/19	COUMO	Fecal coliform bacteria	Field duplicate exceedance	J
4/26/19	MONMN, TOSMI, TYLMI, TYLMO	Dissolved copper	Filter blank exceedance	J
7/10/19	MONM	Turbidity	Field duplicate exceedance	J
9/20/19	MONMN	Fecal coliform bacteria	Field duplicate exceedance	J

J = Value qualified as an estimate based on quality assurance review.

U = Value is below the reporting limit.

TKN = Total Kjeldahl nitrogen

TP = total phosphorus

TSS = total suspended solids

In addition, Appendix I presents box and whisker plots that were developed from these same data that show the minimum and maximum values (lower and upper whiskers, respectively), 25th and 75th percentile values (lower and upper box edges, respectively), and median value (line in box). When nondetect values were present in the data, a value of one-half the detection limit was used in the computation of summary statistics.

In addition to the collection of grab samples during storm events and base flow, continuous monitoring of temperature was performed at all 14 of the fixed monitoring stations that are identified in the *Experimental Design* section of this document for water quality monitoring. Continuous monitoring of conductivity was also performed at the following subset of stations: EVALSS, EVAMS, MONM, MONMS, TOSMO, SEIMN, SEIMS, COUMO, and TYLMO. Line plots showing the continuous temperature and conductivity data collected at each of these stations

are provided in Appendices J and K, respectively. The line plots for the continuous temperature data also show the 7-day average of the daily maximum temperatures (7-DAYMAX) relative to the applicable aquatic life temperature criterion for surface waters of the state of Washington (Ecology 2016).

Based on reviews of the continuous temperature and conductivity data presented in Appendices J and K, the following quality assurance issues were identified in connection with these data:

- No continuous conductivity data are available for the EVAMS station over the period from June 28, 2019, through July 23, 2019.
- No continuous conductivity data are available for the SEIMS station over the period from June 5, 2019, through July 23, 2019.
- No continuous conductivity data are available for the TYLMO station over the period from October 1, 2019, through October 4, 2019.

PHYSICAL HABITAT MONITORING

Physical habitat monitoring for WY2019 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 7/31/2019
- EVAMS 8/2/2019
- MONT-1 8/7/2019
- MONT-2 7/26/2019
- MONT-3 7/23/2019
- MONT- 4 8/9/2019
- MONT-5 7/11/2019
- TOSH-1 7/19/2019
- TOSH-2 7/19/2019
- TOSH-3 8/13/2019
- TOSH-4 8/14/2019

- COLIN-1 7/2/2019
- SIDL-1 7/18/2019
- SIDL-2 7/25/2019
- SIDL-3 7/30/2019
- CTRY-1 7/31/2019
- CTRY-2 8/6/2019
- TYLR-1 8/26/2019
- TYLR-2 8/19/2019

Compiled field data from this monitoring are presented in Appendix L and the computed indicators for evaluating physical habitat quality are presented in Appendix M. Finally, Appendix N provides tables with summary statistics for the indicators that are organized in the following categories:

- Bed stability (Table N-1)
- Channel dimensions (Table N-2)
- Fish cover (Table N-3)
- Habitat dimensions (Table N-4)
- Habitat unit extents (Table N-5)
- Large woody debris (Table N-6)
- Riparian cover (Table N-7)
- Riparian Disturbance (Table N-8)
- Riparian vegetation structure (Table N-9)
- Sinuosity (Table N-10)
- Substrate (Table N-11)

SEDIMENT QUALITY MONITORING

Sediment quality monitoring for WY2019 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 7/31/2019
- EVAMS 8/29/2019
- MONT-1 8/29/2019
- MONT-2 7/26/2019
- MONT-3 7/23/2019
- MONT-4 8/9/2019
- MONT-5 7/11/2019
- TOSH-1 7/19/2019
- TOSH-2 7/12/2019
- TOSH-3 8/13/2019
- TOSH-4 8/14/2019
- COLIN-1 7/23/2019
- SIDL-1 7/30/2019
- SIDL-2 7/25/2019
- SIDL-3 7/30/2019
- CTRY-1 8/29/2019
- CTRY-2 8/6/2019
- TYLR-1 8/26/2019
- TYLR-2 8/19/2019

Field data laboratory reports and data quality audit forms from sediment quality sampling in WY2019 are provided in Appendix O. The memorandum documenting results from the quality assurance review that was performed on these data is provided in Appendix P. No values were qualified as estimates or rejected.

Total organic carbon, zinc, and copper concentrations measured in sediment samples are presented in Table 8. Concentrations of PAHs and phthalates are presented in Tables 9 and 10, respectively.

Table 8. Concentrations of Total Organic Carbon, Copper, and Zinc Measured in Sediment Samples.[a]

Station	Watershed Type	Total Organic Carbon (percent)	Copper (mg/Kg)	Zinc (mg/Kg)
EVALSS	A	6.1	26	75
EVAMS	A	17	16	76
MONT-1	A	5.3	29	380
MONT-2	A	3	30	560
MONT-3	A	13	55	880
MONT-4	A	6.7	58	360
MONT-5	A	7.9	35	220
TOSH-1	A	2.3	27	390
TOSH-2	A	2.3	30	470
TOSH-3	A	4.2	35	490
TOSH-4	A	1.2	23	350
COLIN-1	R	3.6	16	81
SIDL-1	R	7.2	17	71
SIDL-2	R	4	24	52
SIDL-3	R	11	18	80
CTRY-1	C	2.8	32	340
CTRY-2	C	7.1	20	80
TYLR-1	C	0.9	35	290
TYLR-2	C	7.8	89	480

[a] Samples were processed (sieved) in the field to make two unique samples. The first sample was sieved to less than 2.0 mm and analyzed for multiple organic compounds (PAHs and phthalates) and total-organic carbon. The second sample was sieved to less than 63 µm and analyzed for metals (copper and zinc).

mg/Kg = milligram/kilogram

A = Application

R = Reference

C = Control

Table 9. Concentrations of Polycyclic Aromatic Hydrocarbons Measured in Sediment Samples.[a]

Station	Watershed Type	1-Methyl-naphthalene (mg/Kg)	2-Methyl-naphthalene (mg/Kg)	Ace-naphthene (mg/Kg)	Ace-naphthylene (mg/Kg)	Anthracene (mg/Kg)	Benzo[a]-anthracene (mg/Kg)	Benzo(a)-pyrene (mg/Kg)	Benzo(b)-fluoranthene (mg/Kg)	Benzo(ghi)-perylene (mg/Kg)	Benzo(j,k)-fluoranthene (mg/Kg)	Chrysene (mg/Kg)	Dibenzo(a,h)-anthracene (mg/Kg)	Fluoran-thene (mg/Kg)	Fluorene (mg/Kg)	Indeno-(1,2,3cd)-pyrene (mg/Kg)	Naph-thalene (mg/Kg)	Phenan-threne (mg/Kg)	Pyrene (mg/Kg)	Total PAHs (mg/Kg)
EVALSS	A	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.042	0.046	0.071	0.020	0.020	0.053	0.006 U	0.034	0.006 U	0.024	0.006 U	0.006 U	0.055	0.365
EVAMS	A	0.019 U	0.019 U	0.023	0.019 U	0.019 U	0.051	0.062	0.079	0.042	0.021	0.058	0.019 U	0.130	0.019 U	0.047	0.019 U	0.085	0.130	0.728
MONT-1	A	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
MONT-2	A	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U
MONT-3	A	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.054	0.072	0.051 U	0.051 U	0.051 U	0.054	0.051 U	0.051 U	0.051 U	0.051 U	0.057	0.237
MONT-4	A	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U
MONT-5	A	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U
TOSH-1	A	0.007 U	0.007 U	0.007 U	0.007 U	0.008	0.048	0.057	0.078	0.048	0.029	0.055	0.007 U	0.110	0.007 U	0.049	0.007 U	0.058	0.091	0.631
TOSH-2	A	0.008 U	0.008 U	0.008 U	0.008 U	0.015	0.072	0.077	0.110	0.055	0.036	0.078	0.010	0.160	0.008 U	0.056	0.008 U	0.085	0.120	0.874
TOSH-3	A	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.042	0.046	0.079	0.046	0.025	0.060	0.008 U	0.110	0.008 U	0.050	0.008 U	0.055	0.090	0.603
TOSH-4	A	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.009	0.010	0.006 U	0.007	0.006 U	0.006	0.006 U	0.007	0.006 U	0.006 U	0.008	0.047
COLIN-1	R	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
SIDL-1	R	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.047	0.050	0.038 U	0.038 U	0.038 U	0.038 U	0.048	0.038 U	0.038 U	0.038 U	0.038 U	0.071	0.216
SIDL-2	R	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
SIDL-3	R	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.026	0.026
CTRY-1	C	0.011 U	0.011 U	0.022	0.014	0.066	0.190	0.180	0.250	0.130	0.094	0.220	0.034	0.430	0.031	0.110	0.011 U	0.300	0.440	2.511
CTRY-2	C	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
TYLR-1	C	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
TYLR-2	C	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014	0.019	0.014 U	0.014 U	0.014 U	0.014 U	0.015	0.014 U	0.014 U	0.014 U	0.014 U	0.016	0.064

[a] Samples were processed (sieved) in the field to make two unique samples. The first sample was sieved to less than 2.0 mm and analyzed for multiple organic compounds (PAHs and phthalates) and total-organic carbon. The second sample was sieved to less than 63 µm and analyzed for metals (copper and zinc).

mg/Kg = milligram/kilogram

A = Application

R = Reference

C = Control

U = Undetected at the detection limit noted

Table 10. Concentrations of Phthalates Measured in Sediment Samples.[a]							
Station	Watershed Type	bis(2-Ethylhexyl)-phthalate (mg/Kg)	Butylbenzyl-phthalate (mg/Kg)	Diethyl-phthalate (mg/Kg)	Dimethyl-phthalate (mg/Kg)	Di-n-butylphthalate (mg/Kg)	Di-n-octylphthalate (mg/Kg)
EVALSS	A	0.056	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U
EVAMS	A	0.260	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U
MONT-1	A	0.170	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U
MONT-2	A	0.048	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U
MONT-3	A	0.990	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
MONT-4	A	0.150	0.092 U	0.092 U	0.092 U	0.092 U	0.092 U
MONT-5	A	0.170 U	0.170 U	0.170 U	0.170 U	0.170 U	0.170 U
TOSH-1	A	0.200	0.180 U	0.180 U	0.180 U	0.180 U	0.180 U
TOSH-2	A	0.200	0.190 U	0.190 U	0.190 U	0.190 U	0.190 U
TOSH-3	A	0.220	0.049	0.041 U	0.041 U	0.041 U	0.041 U
TOSH-4	A	0.096	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
COLIN-1	R	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
SIDL-1	R	0.260	0.190 U	0.190 U	0.190 U	0.190 U	0.190 U
SIDL-2	R	0.045 U	0.045 U	0.045 U	0.045 U	0.045 U	0.045 U
SIDL-3	R	0.099	0.086 U	0.086 U	0.086 U	0.086 U	0.086 U
CTRY-1	C	0.250	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
CTRY-2	C	0.076	0.150 U	0.058 U	0.058 U	0.058 U	0.058 U
TYLR-1	C	0.049	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
TYLR-2	C	0.240	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U

[a] Samples were processed (sieved) in the field to make two unique samples. The first sample was sieved to less than 2.0 mm and analyzed for multiple organic compounds (PAHs and phthalates) and total-organic carbon. The second sample was sieved to less than 63 µm and analyzed for metals (copper and zinc).

mg/Kg = milligram/kilogram

A = Application

R = Reference

C = Control

U = Undetected at the detection limit noted.

BIOLOGICAL MONITORING

Biological monitoring for WY2019 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 7/31/2019
- EVAMS 8/2/2019
- MONT-1 8/7/2019
- MONT-2 7/26/2019
- MONT-3 7/23/2019
- MONT-4 8/9/2019
- MONT-5 7/11/2019
- TOSH-1 7/19/2019
- TOSH-2 7/12/2019
- TOSH-3 8/13/2019
- TOSH-4 8/14/2019
- COLIN-1 7/2/2019
- SIDL-1 7/18/2019
- SIDL-2 7/25/2019
- SIDL-3 7/30/2019
- CTRY-1 7/31/2019
- CTRY-2 8/6/2019
- TYLR-1 8/26/2019
- TYLR-2 8/19/2019

The laboratory report for biological monitoring in WY2019 is provided in Appendix Q. Quality assurance review documentation for these data is provided in Appendix R. Results from this review indicated there were no significant quality assurance issues that would limit the use of the data. The indicators computed from these data for use in evaluating stream health are summarized in Table 11.

Table 11. Computed Biological Indicators for Evaluating Stream Health.

Station	Watershed Type	Overall Condition	Benthic Index of Biotic Integrity	Total Taxa Richness	Ephemeroptera Richness	Plecoptera Richness	Trichoptera Richness	Clinger Taxa Richness	Long-Lived Taxa Richness	Intolerant Taxa Richness	Percent Dominant (top 3)	Percent Predator Individuals	Percent Tolerant Individuals
EVALSS	A	Fair	49.3	30	4	5	4	16	8	4	58.3%	20.6%	28.9%
EVAMS	A	Good	77.3	40	5	7	6	18	10	5	34.2%	26.9%	3.2%
MONT-1	A	Fair	48.6	30	3	4	6	12	6	0	35.4%	19.4%	8.6%
MONT-2	A	Poor	35.9	28	2	3	3	10	7	0	51.3%	39.2%	17.5%
MONT-3	A	Poor	15.3	25	1	2	3	8	5	0	59.1%	8.0%	39.2%
MONT-4	A	Fair	40.2	53	2	3	2	9	5	0	30.5%	9.2%	14.5%
MONT-5	A	Fair	50.3	45	3	4	7	11	7	0	47.6%	14.6%	7.4%
TOSH-1	A	Poor	28.3	20	2	2	3	8	6	0	47.1%	12.7%	19.1%
TOSH-2	A	Poor	31.1	32	2	3	4	11	5	0	43.0%	9.2%	25.2%
TOSH-3	A	Poor	27.4	27	3	3	3	8	6	0	45.0%	5.7%	22.7%
TOSH-4	A	Very Poor	12.6	22	3	2	3	7	3	0	81.6%	5.8%	33.7%
COLIN-1	R	Good	67.6	47	6	6	6	16	7	3	47.6%	19.6%	3.0%
SIDL-1	R	Fair	43.9	36	3	5	5	15	6	2	62.6%	7.0%	0.4%
SIDL-2	R	Fair	58.4	31	6	4	5	12	6	6	38.5%	35.2%	17.8%
SIDL-3	R	Fair	56.5	34	4	4	6	14	6	3	41.2%	32.8%	6.9%
CTRY-1	C	Very Poor	11.8	23	1	1	1	4	6	0	58.8%	0.6%	25.8%
CTRY-2	C	Fair	45.4	46	3	5	4	8	6	0	37.2%	9.2%	7.4%
TYL-1	C	Poor	22.3	22	2	2	4	6	3	0	42.5%	7.8%	26.1%
TYL-2	C	Very Poor	11.1	21	1	2	0	5	3	0	56.0%	0.8%	22.0%

A = Application
R = Reference
C = Control

REFERENCES

DeGasperi, C.L., H.B. Berge, K.R. Whiting, J.J. Burkey, J.L. Cassin, and R.R. Fuerstenberg. 2009. Linking Hydrologic Alteration to Biological Impairment in Urbanizing Streams of the Puget Lowland, Washington, USA. Journal of the American Water Resources Association 45(2):512–533.

Ecology. 2011. Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies: Technology Assessment Protocol – Ecology (TAPE). Washington State Department of Ecology. Accessed July 13, 2015. <https://fortress.wa.gov/ecy/publications/summarypages/1110061.html>.

Ecology 2016. Water Quality Standards for Surface Waters of the State of Washington. Chapter 173-201A WAC. Adopted August 1, 2016. Washington State Department of Ecology. Water Quality Program. Olympia, Washington. Revised October 2017. Publication No. 06-10-091. <https://fortress.wa.gov/ecy/publications/documents/0610091.pdf>.

Helsel, D.R. and R.M. Hirsch, 2002. Statistical Methods in Water Resources Techniques of Water Resources Investigations, Book 4, chapter A3. US Geological Survey.

Herrera. 2004. Year 2003 Water Quality Data Report, Green-Duwamish Watershed Water Quality Assessment. Prepared for King County Department of Natural Resources and Parks, by Herrera Environmental Consultants, Inc., Seattle, Washington.

Herrera. 2011. Toxics in Surface Runoff to Puget Sound: Phase 3 Data and Load Estimates. Publication No. 11-03-010. Prepared for the Washington State Department of Ecology by Herrera Environmental Consultants, Inc., Seattle, Washington. April.

Herrera. 2013. City of Redmond, Washington Citywide Watershed Management Plan. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. November 25.

Herrera. 2015a. Redmond Paired Watershed Study Experimental Design Report. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. July 14.

Herrera. 2015b. Redmond Paired Watershed Study: Monitoring Literature Review Summary Report. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. April 23.

Herrera. 2015c. Quality Assurance Project Plan: Redmond Paired Watershed Study. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. December 31.

Herrera. 2017. Redmond Paired Watershed Study: Water Year 2016 Data Summary Report. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. August 31.

Herrera. 2018. Redmond Paired Watershed Study: Water Year 2017 Data Summary Report. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. July 18.

Herrera. 2019. Redmond Paired Watershed Study: Water Year 2018 Data Summary Report. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. September 9.

Herrera. 2020. Monticello Basin Street Sweeping Water Quality Trend Analysis. Prepared for the City of Redmond by Herrera Environmental Consultants, Inc., Seattle, Washington. March 23.

APPENDIX A

Line Plots Showing Continuous Flow Data by Watershed

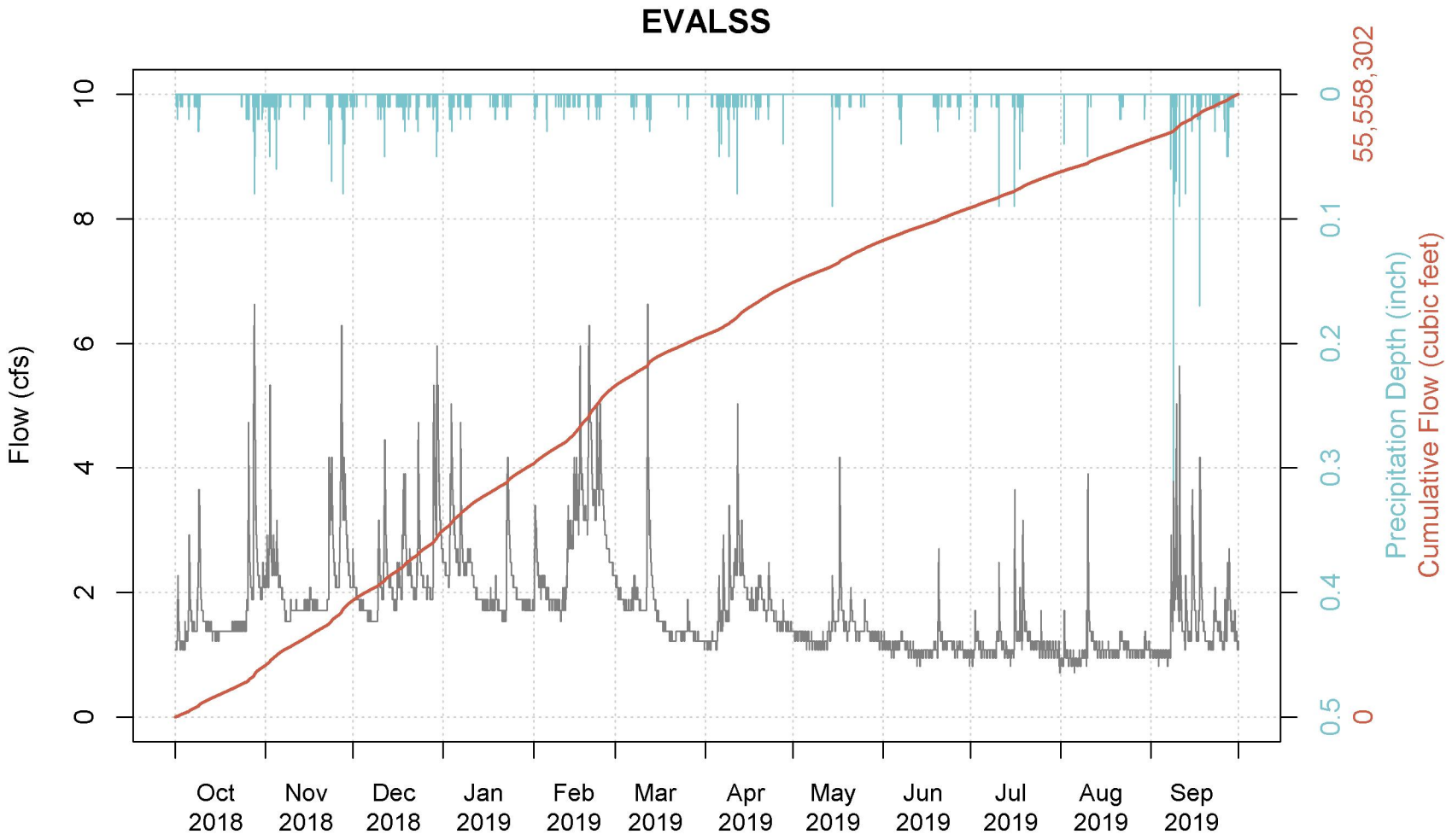


Figure A-1. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the EVALSS Station.

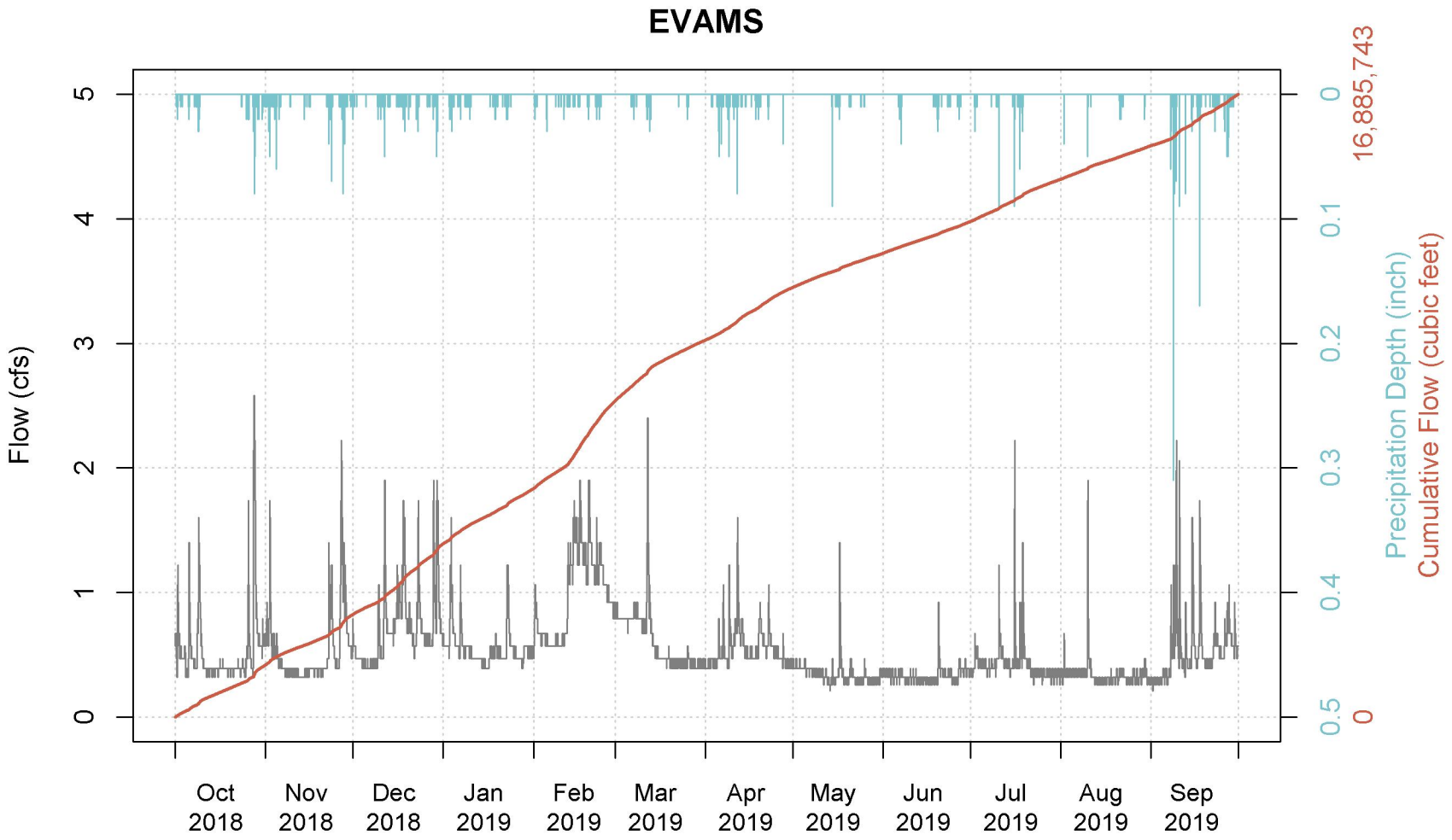


Figure A-2. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the EVAMS Station.

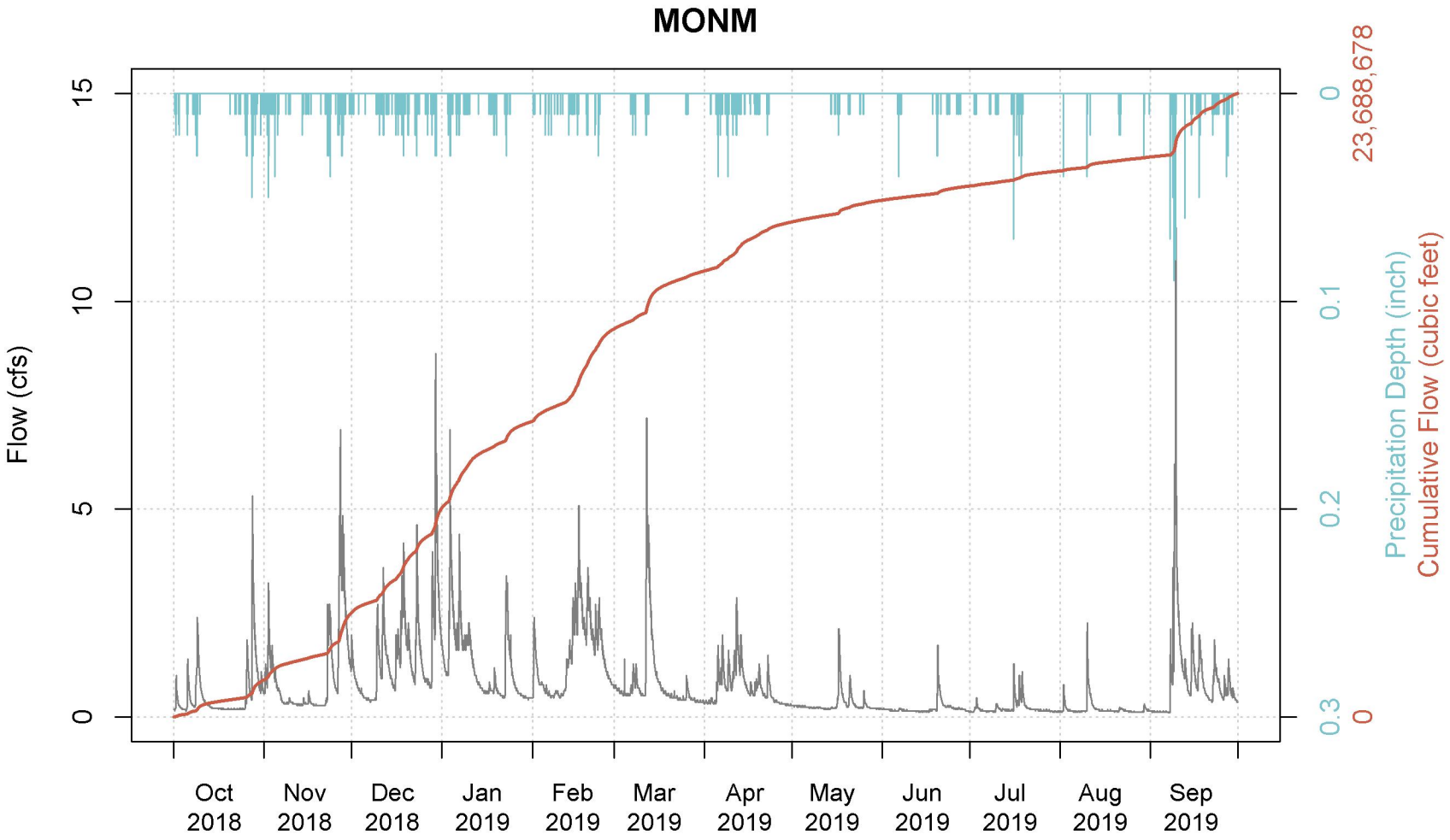


Figure A-3. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONM Station.

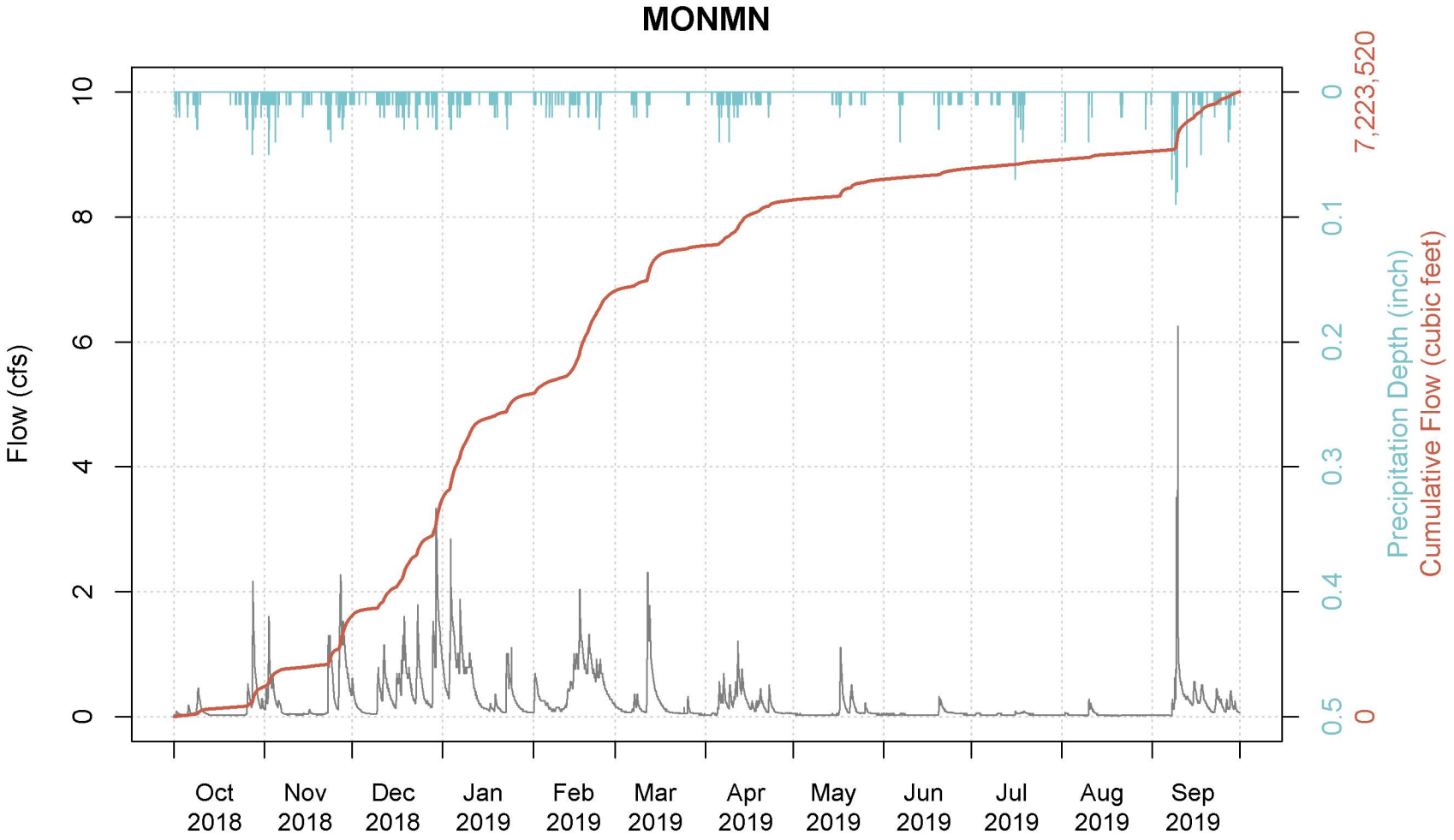


Figure A-4. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONMN Station.

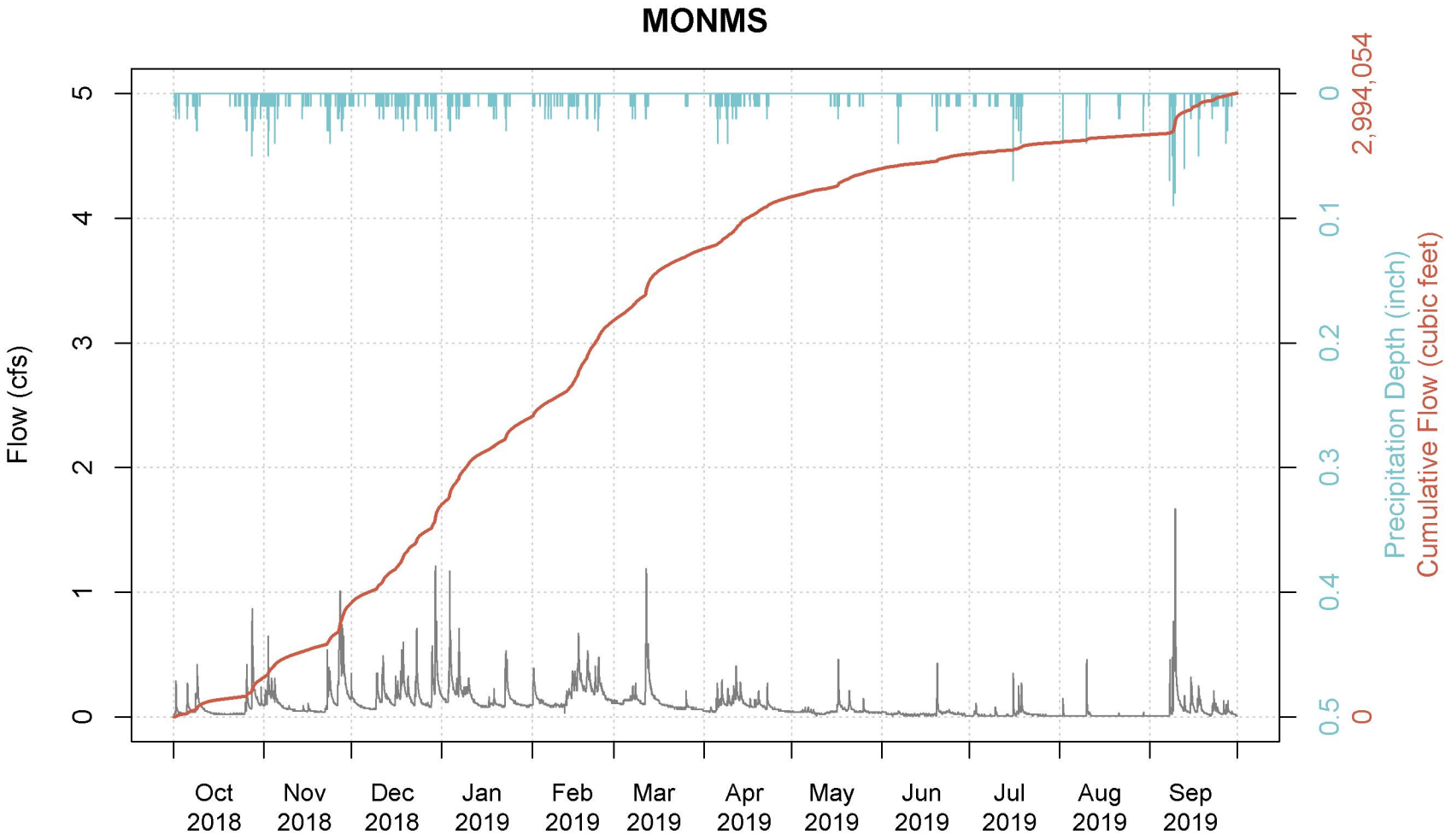


Figure A-5. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONMS Station.

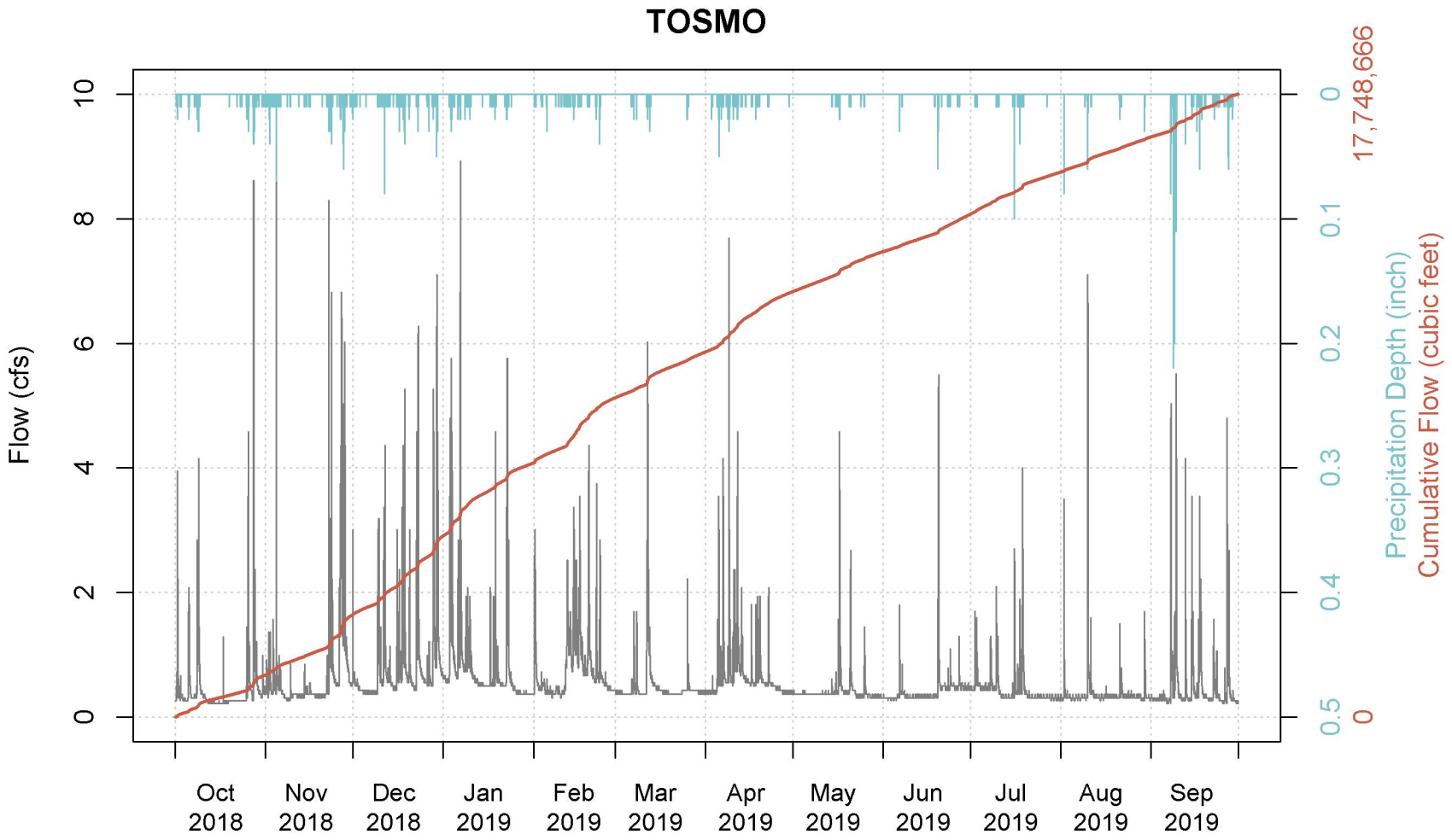


Figure A-6. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TOSMO Station.

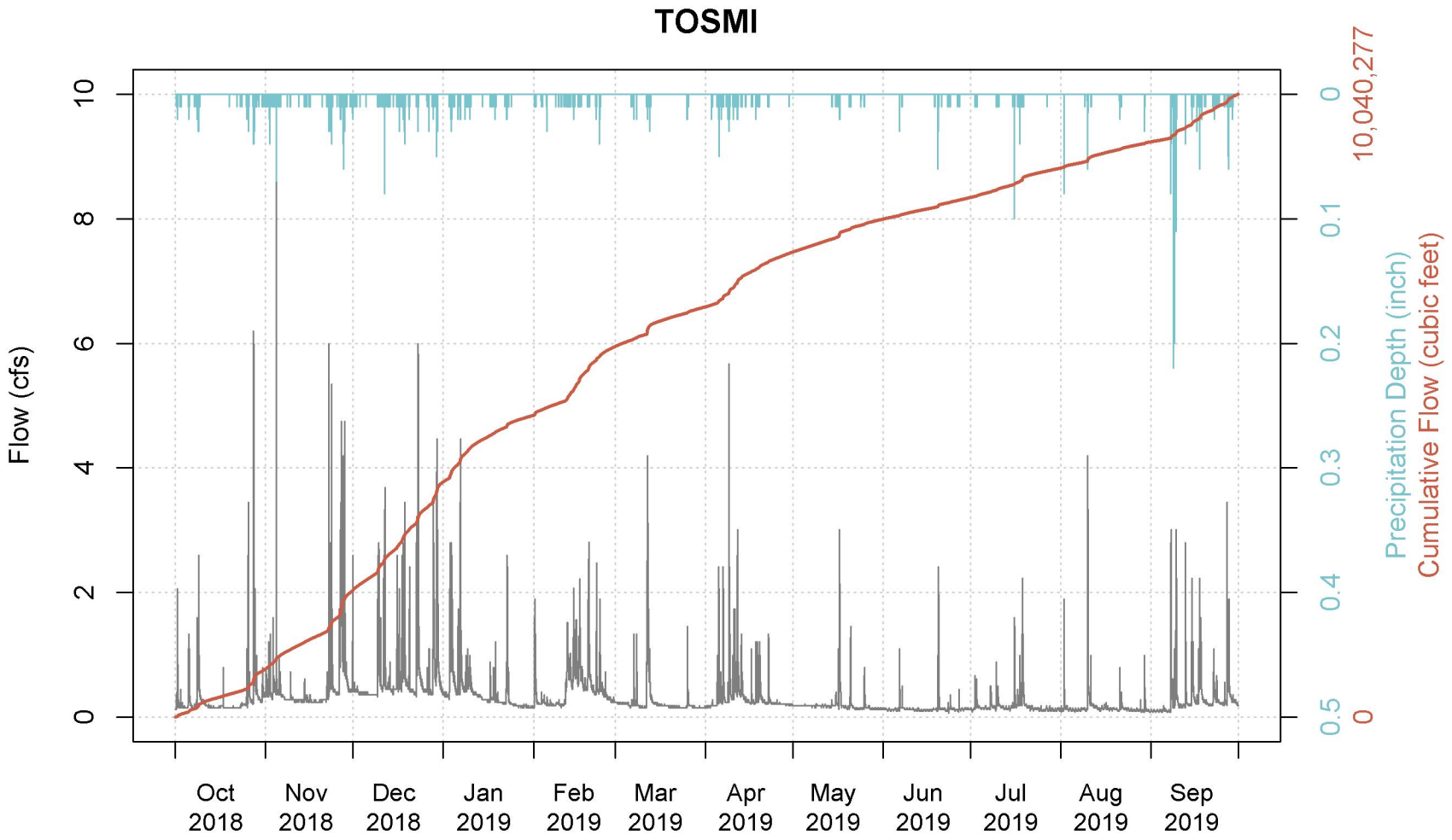


Figure A-7. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TOSMI Station.

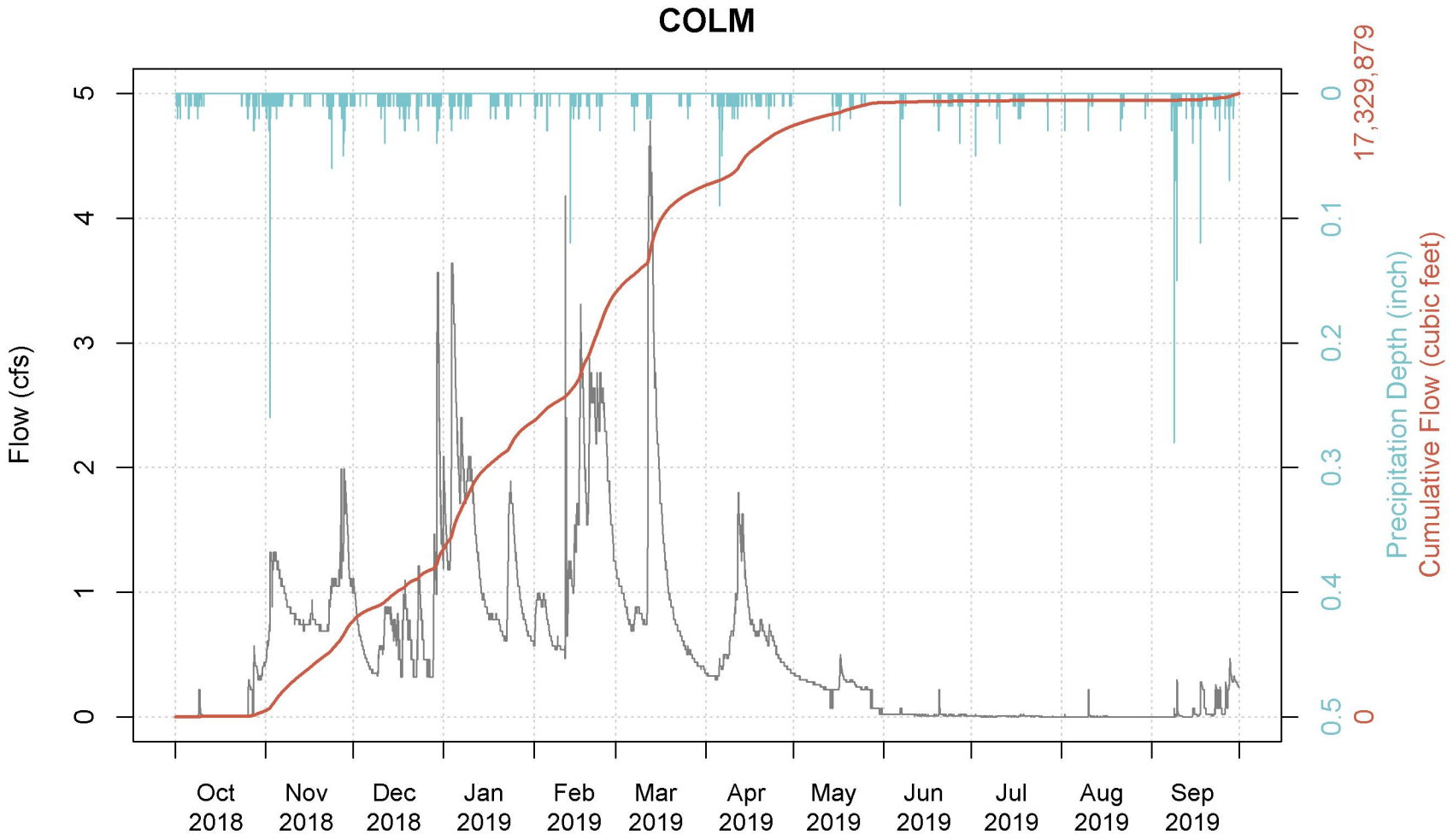


Figure A-8. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COLM Station.

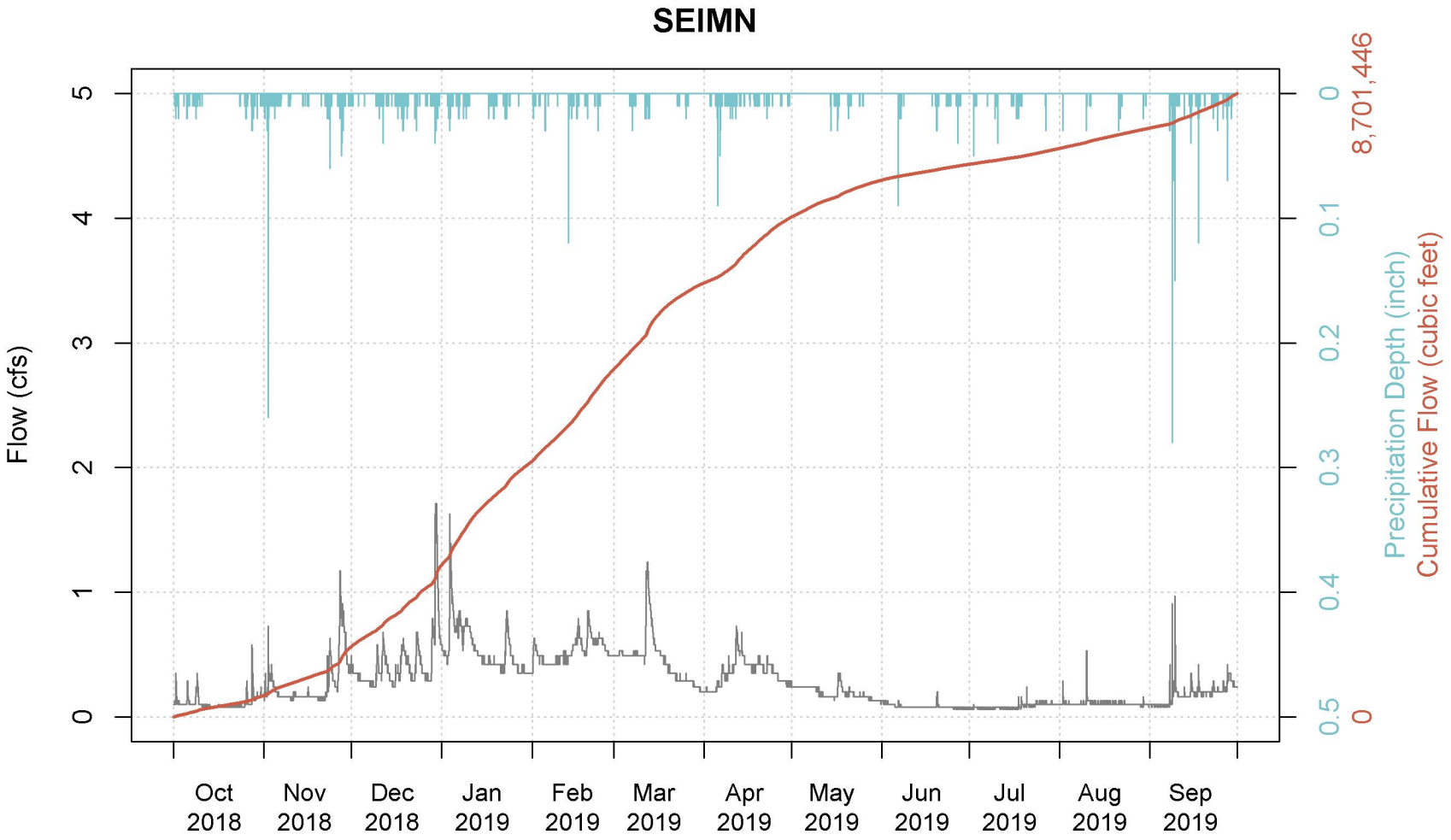


Figure A-9. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the SEIMN Station.

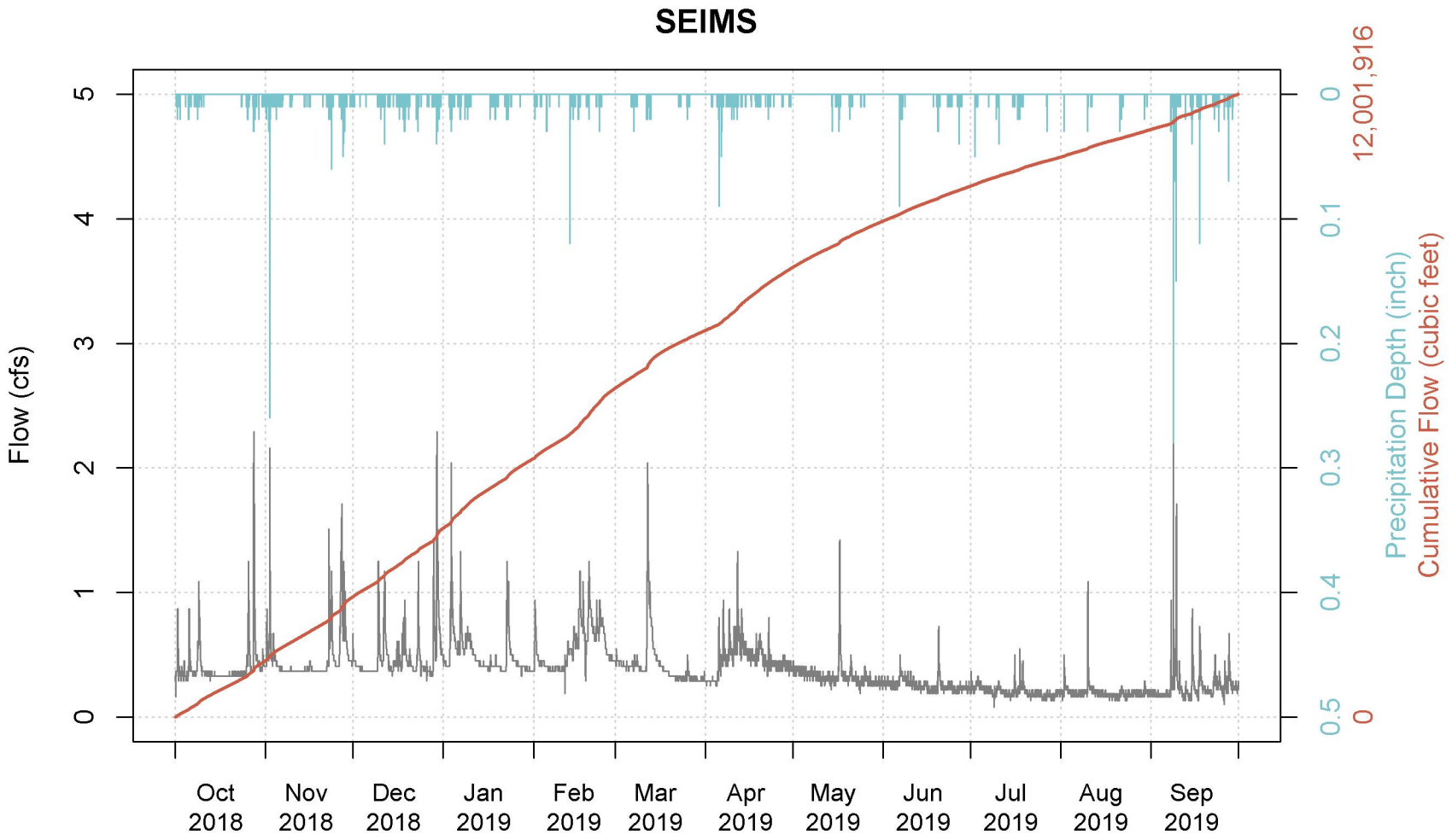


Figure A-10. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the SEIMS Station.

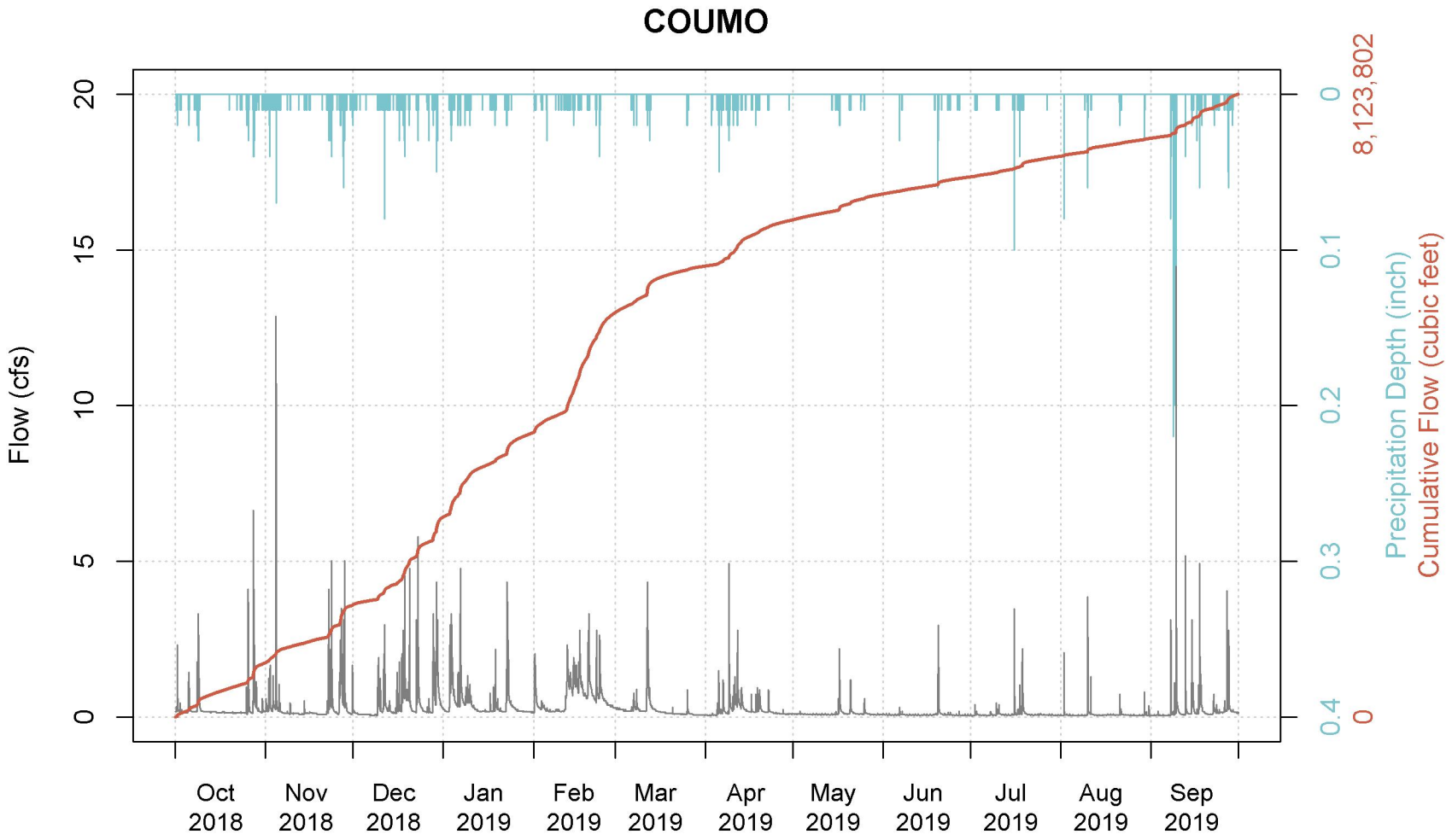


Figure A-11. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COUMO Station.

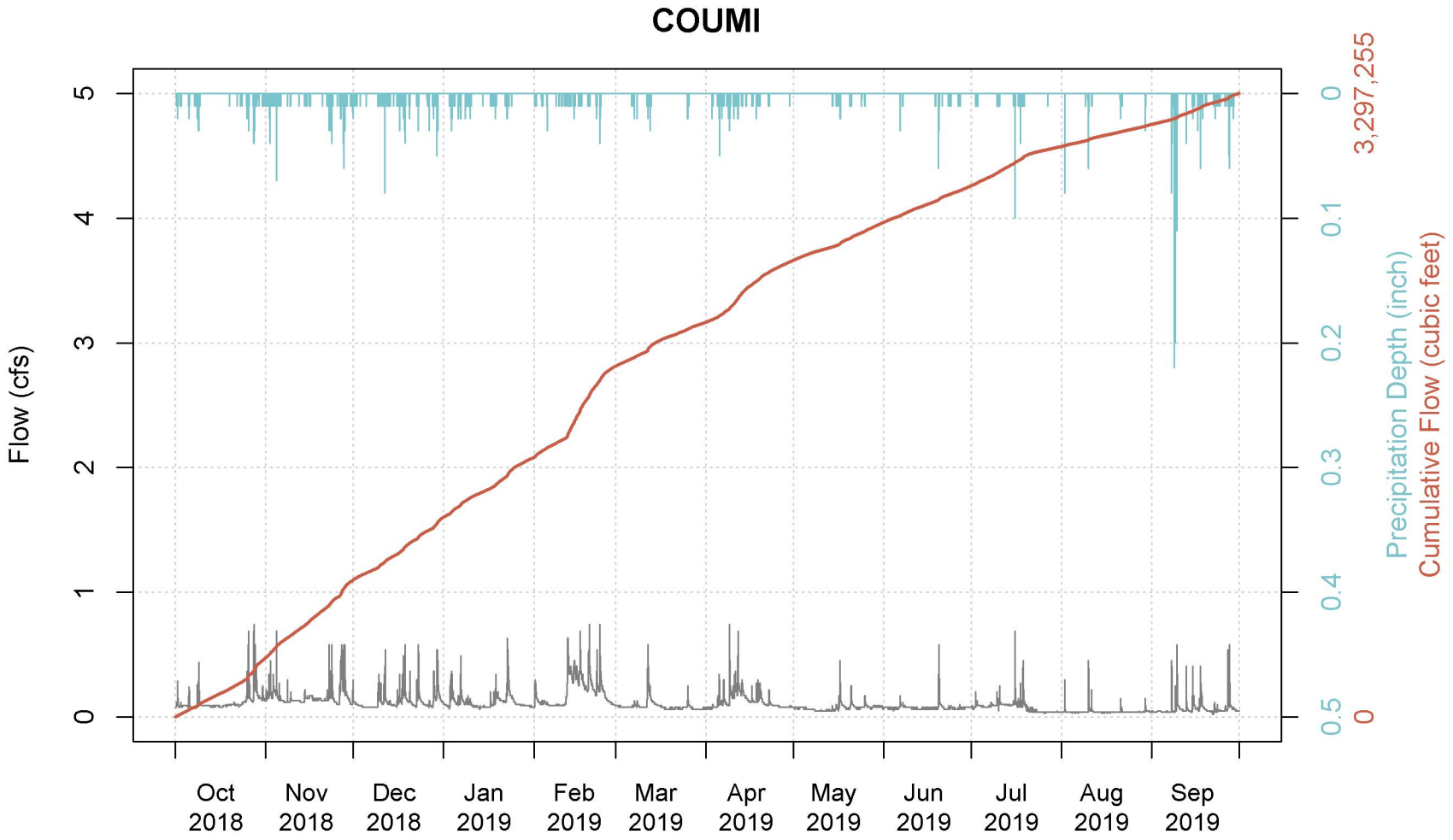


Figure A-12. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COUMI Station.

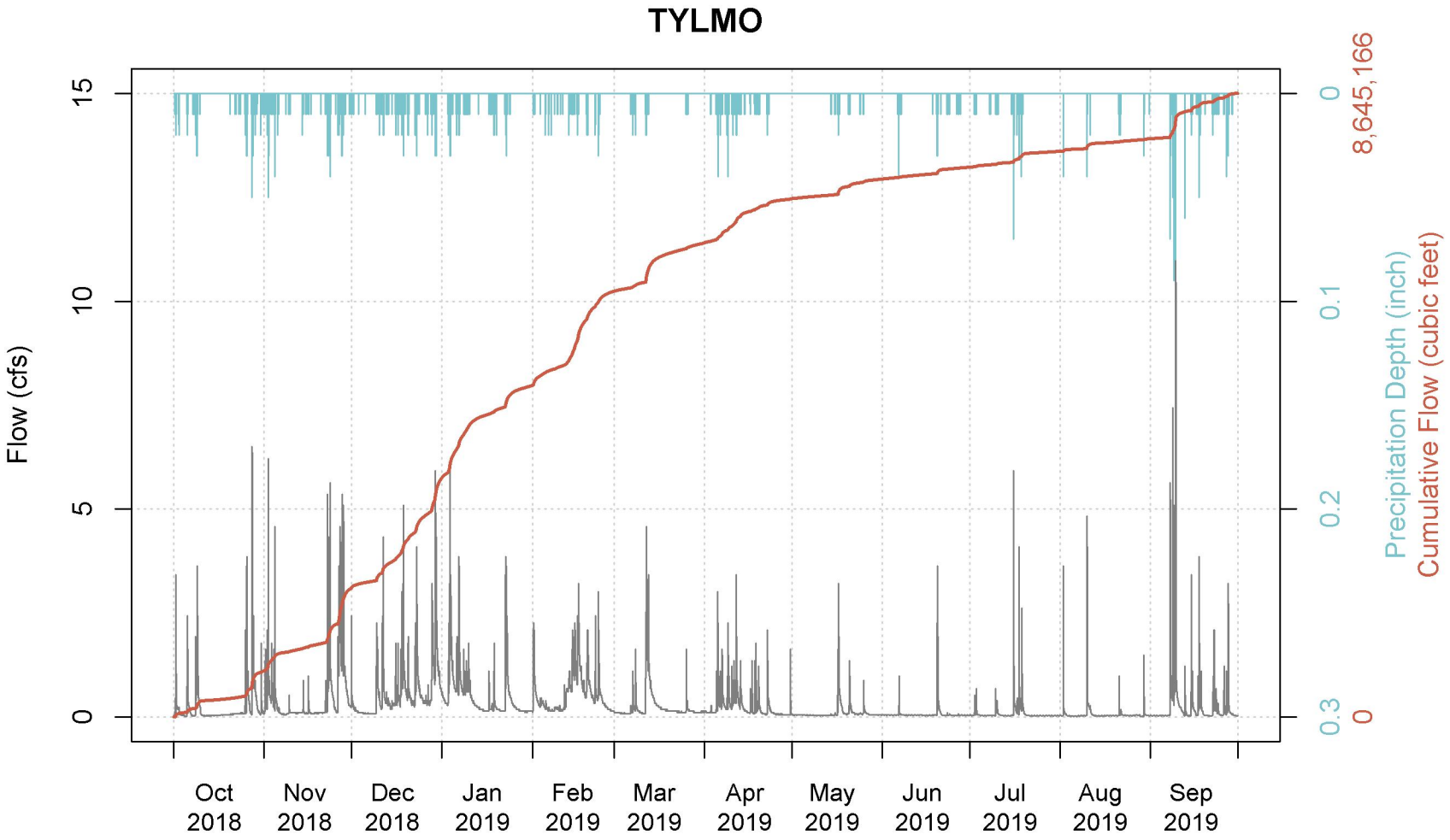


Figure A-13. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TYLMO Station.

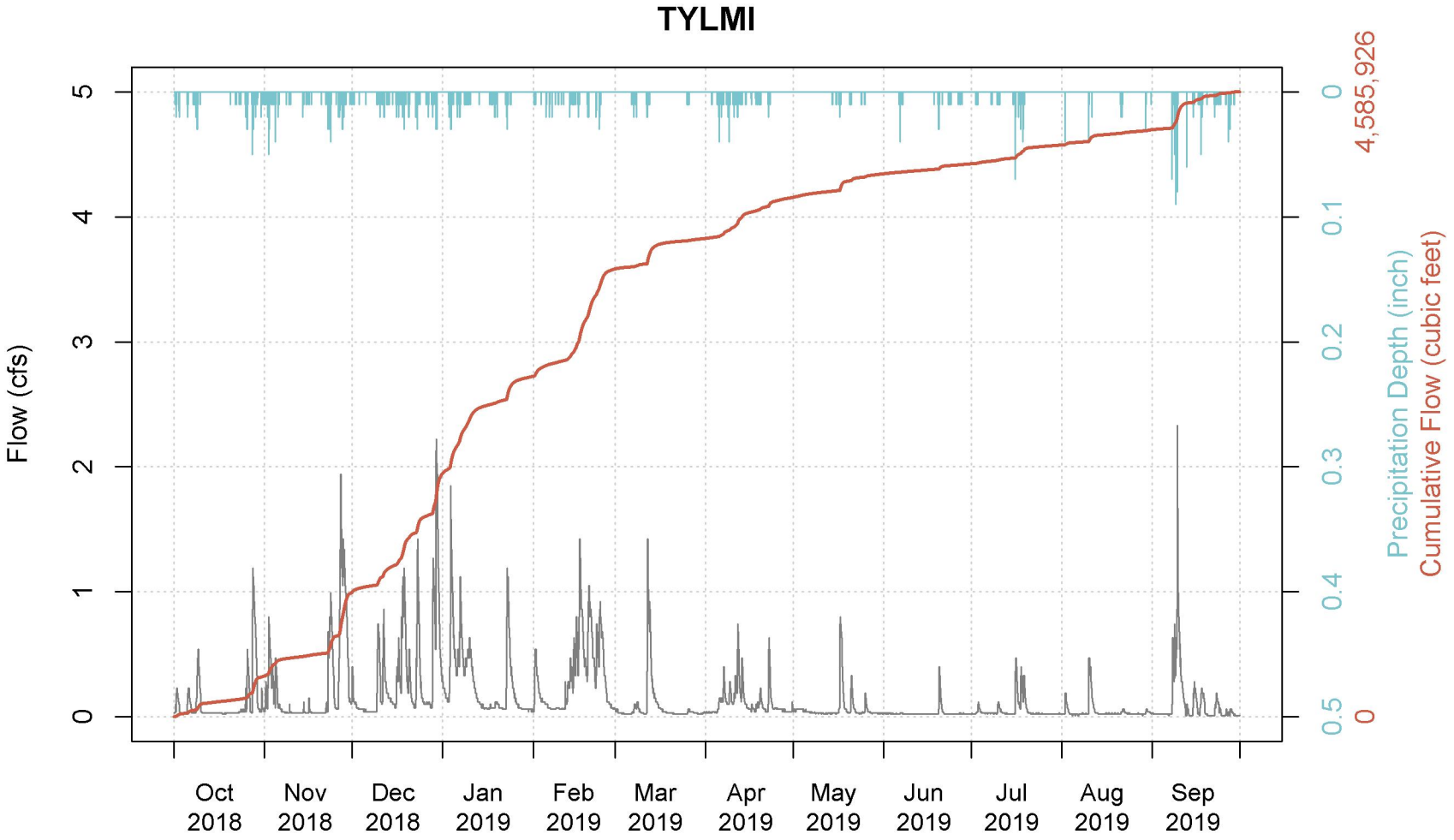


Figure A-14. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TYLMI Station.

APPENDIX B

Data Quality Assurance Review Memorandum for Hydrologic Monitoring

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Department of Natural Resources and Parks
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TECHNICAL MEMORANDUM

March 21, 2019

TO: Dylan Ahearn, Associate Scientist, Herrera

FM: David Funke, Science and Technical Support Section, Water and Land Resources Division, Department of Natural Resources and Parks

RE: RPWS Hydrologic Data QA Memo

Introduction

This memo summarizes the results of the Quality Assurance review of hydrologic data collected by King County Department of Natural Resources (KCDNRP), Water and Land Resources Division (WLRD), Hydrologic Monitoring Program for the Redmond Paired Watershed Study for the period ending December 31, 2018. Streamflow is determined at 14 sites for the study. Water temperature is recorded at all 14 sites and conductivity loggers were deployed at eight sites for the 2018 water year.

Quality Assurance Review of Data

QA Review Methods

While all 14 project stream gages are updated via telemetry, ultimately the final continuous hydrologic data is input into the King County Hydrologic database with a supervised process using a desktop computer application. The technician works from a plot (printed chart created in a spreadsheet) of the continuous values for a set period, usually 4 to 8 weeks and bracketed by field observations. For discharge data, the water level corrections, rating table and shifts used are noted on the plot, along with explanatory notes. The plot is stored in the project file for the gage along with field notes and other materials. Rating curve development and gage problem solving occurs in a collegial environment with the team staff. Recorded data and field

measurements are reviewed throughout the year to identify problems and target necessary measurements.

Annual review of the water year is performed after the final supervised workup. Data are reviewed by a different team member than who performed the initial workup. A spreadsheet template is used with daily mean, max and min values, rainfall, comparison gages, field observations, and a QC checklist to structure the review. The review process is described in the STREAM GAGE DATA WORKUP QA/QC section below.

RPWS WY 2018 and Calendar Year 2018

Rainfall totals were above average for November 2017, and January and April 2018. Over 2 inches in 24 hours were recorded April 14–15 in the Redmond area, producing the peak flow for the water year and calendar year 2018. Summer 2018 was dry, with less than 4 inches of rain for May through August, with much of it falling over 2 days mid-June.

Ten largest 24-hour rain totals from the Monticello rain gage are listed below with direct measurements of stream discharge were made during the shaded storms:

End Date	24 hr total, inch
4/15/2018	2.29
11/22/2017	1.69
12/19/2017	1.56
12/29/2017	1.49
11/27/2018	1.42
6/14/2018	1.40
10/19/2017	1.29
1/18/2018	1.24
10/28/2018	1.22
1/9/2018	1.18

<u>COLM Colin Creek Mid Site</u>
The record is fair, with the stream mostly dry in August and September.

<u>COUMO Country Creek at Mouth</u>
Record fair. Frequent scour and fill at this site necessitates rating shifts. Peak recorded discharge 5.3 cfs in April. Sediment affected working of the water level sensor and the back up 15-minute sensor record was used for extensive periods.

COUMI Country Creek Mid Site
Record poor. Scour and fill at this site necessitates rating shifts. Observed channel hydraulics during April 14–15 storm made water level record unreliable. The main gage water level sensor seemed to work poorly in May and June so the 15-minute record from the backup sensor was used. Maintenance improved the subsequent readings. Low resolution hydraulic control.

EVALSS Evans Lower Stream Site
Record good. Peak recorded discharge 20 cfs; highest discharge measurement 11 cfs. The new rating curve after the 2017 scour event is reasonably stable. The instrumentation functioned well throughout the period.

EVAMSS Evans Mid Stream Site
Record fair. Peak flow for period 5.8 cfs; maximum measured was 4.4 cfs. Scour and fill at this site necessitates rating shifts. Low flow periods have potential for large per cent error.

MONMO Monticello Mouth Site
Record good. Water level measured behind a metal weir, but flow is very turbulent during stormflow. Peak recorded discharge 32 cfs; highest discharge measurement 28 cfs.

MONMN Monticello Mid North Site
Record poor. Channel not conducive to stable rating. Peak discharge 23 cfs for period; highest flow measurement 12 cfs. There were many non-storm related discharges to the channel.

MONMS Monticello Mid South Site
Record fair. Flow goes very low at times. Difficult to measure low flows. Peak discharge 4.4 cfs for period; highest discharge measurement 3.6 cfs.

SEIMN Seidel Mid North Site (formerly 02o)
Record fair. Stream gage operated at this site since 2008. Water level measured behind an old existing concrete weir. There is some evidence that the sediment load is increasing in the channel making the weir rating less stable. Two large flow peaks in April likely due to impounded water upstream being released. Peak discharge 11 cfs for period; highest discharge measurement 4.1 cfs.

SEIMS Seidel Mid South Site (formerly 02p)
Record fair. Stream gage operated at this site since 2008. Water level measured behind an old existing concrete flume structure. Peak discharge 6.8 cfs for period; highest discharge measurement 3.1 cfs.

TOSMO Tosh Mouth Site
Record good except for peak flows above 12 cfs. Water level measured behind a concrete weir, but flow is not contained in the notch during high stormflows. Peak recorded discharge 18 cfs; highest discharge measurement 8.3 cfs.

TOSMI Tosh Mid Site
Record poor. The channel here gives a low resolution rating. Access to the site is difficult. Peak recorded discharge 14 cfs; highest discharge measurement 5.1 cfs.

TYLMO Tyler Mouth Site
Record fair. Water level measured behind a metal weir, but the channel is silted in such that there is not a level pool. Very flashy response to rainfall. Peak recorded discharge 15 cfs; highest discharge measurement 3.0 cfs.

TYLMI Tyler Mid Site
Record poor. Water level measured at outlet to 4.5-foot-diameter culvert, behind a rock control. Stream reacts quickly to rainfall due to nearby street runoff directed to the channel. The site has suffered numerous alterations to the channel by unknown parties, which necessitates many rating corrections. Peak recorded discharge 4.5 cfs; highest discharge measurement 2.3 cfs

STREAM GAGE DATA WORKUP QA/QC

A streamflow data workup should be checked by another technician before approving the data for publication. This is not a rote process or simple checklist. It requires an understanding of the basic elements of a data workup as well as a questioning attitude. The check can go pretty quickly if the person doing the original workup has taken good notes, kept the file in good order, made the necessary graphs and reports, and did not make any mistakes. The QA/QC check should be performed by someone other than the person who did the original workup. This ensures that we get a realistic assessment of the coherence and legibility of the workup and documentation. We want to be able to return to the file at a later date and figure out how the flow data were derived from the primary data. We also want to make sure that the data make sense and contain no errors. Of course, we will never know if our flow data are accurate, but we can know that they are the best numbers possible if rating tables are well developed and the rating properly applied to a carefully corrected stage record. The following steps are outlined in the order they should occur.

Three Objectives

1. Well documented work, so in the future we can figure out what was done and why. If the file and notes are a mess and don't make sense, you give it back and tell them to get it together.
2. Careful work, i.e. no stupid or gross mistakes. No gaps, no big jumps in discharge when there shouldn't be, flow in data table matches the discharge measurement made at that time, sensor garbage is cleaned up. Stupid mistake example: the flow record changes 15% in one log between sessions because the initial sensor correction was set incorrectly.
3. Technically defensible work, no errors in judgment. Rating curves make sense, stage corrections are reasonable, rating shifts applied appropriately, estimated periods make sense.

QA/QC Steps to Checking Flow Records

Documentation

There may be some minor problems with the file organization that did not affect the workup quality. These the checker can fix. Make sure that:

- The paper file is organized correctly
- There is a workup cover sheet with session by session notes
- Workup charts are all there and gaps noted, workup detail is written on the chart
- Discharge Measurement Summary form is up to date
- Flows are correctly plotted on rating curve
- Data input files are stored correctly
- Water year QA spreadsheet is complete (use StreamGage_WaterYear_Report.xlsx template). Charts titles should be correct, rain gage and comparison gage data included, also any continuous water temperature or other water quality data if applicable.

Look for Mistakes

- Is water year complete? Complete 15-minute years have 35,040 records; leap years 35,136 (5-minute have 105,120). Missing data will reduce that number. The logs for the year are displayed on the workup screen. Also, missing data will be held with asterisks in the 15-minute report. Dump the report into excel and sort by value.
- Compare the graph of the daily mean and max flow to that of an equivalent gage. You are looking at the timing and relative magnitude of peaks and low flow periods.
- Examine daily mean and min flows chart. You are looking for periods where the flow drops unrealistically, usually due to sensor problems, a negative value, or a mistaken filled value.
- Check the data table at date and time of discharge measurements. The record should match the flow or there should be a good reason why in the notes.
- Check the plotting of each flow measurement on the rating curve. Sometimes the offset is incorrectly added, or it is just put in the wrong place. It can look right and be wrong, so check.
- Give flow measurements a once over to make sure they are sensible, V*A = Q, the calculated width seems right given the start and end of the cross section. Pay special attention to high flow measurements or any flow that shifts off the normal rating.
- Does the flow record connect well? No unjustified jumps in the discharge between sessions, stage corrections or other events.
- Are estimate periods flagged correctly?

Technical Quality

- Can you understand what rating curves were used, and what they are based on? What defines the high end?
- If the high end depends on a curve extension, are there indirect discharge calculations made to justify the peak flow estimate? Do you agree? This is a highly subjective area that bears careful examination. We expect, of course, that consultation was done during the initial workup, so there will be no big surprises.
- Are base flows accurate? It may be more accurate to estimate low flow periods or fill the stage record than use stage record with known error.
- Check how daily flow estimates to fill gaps were made.
- Compare mean daily discharge with an appropriate nearby station for timing and magnitude of peaks, baseflow etc.

Final Approval

If everything is in order, or after corrections have been made, complete QC checklist sheet in the Water Year spreadsheet. Printout checklist for the paper file. Include name and date.

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TECHNICAL MEMORANDUM

March 16, 2020

TO: Dylan Ahern, Associate Scientist, Herrera

FM: Andrew Miller, Science and Technical Support Section, Water and Land Resources Division, Department of Natural Resources and Parks

RE: RPWS Hydrologic Data QA Memo

Introduction

This memo summarizes the results of the Quality Assurance review of hydrologic data collected by King County Department of Natural Resources (KCDNRP), Water and Land Resources Division (WLRD), Hydrologic Monitoring Program for the Redmond Paired Watershed Study (RPWS). The periods of record covered under this memo vary by parameter:

Specific conductivity and water temperature: January 1, 2019 to September 30, 2019
Rainfall: January 1, 2019, to December 31, 2019
Discharge: January 1, 2019, to December 31, 2019

Stream discharge was determined at 14 sites for the study. Water temperature was recorded at 14 sites and conductivity loggers were deployed at eight sites for the 2019 calendar year. Precipitation, air temperature, and barometric pressure were recorded at three sites.

See Figure 1 in Appendix A for station locations.

Quality Assurance Review of Data

Specific Conductivity

Continuous specific conductivity was measured and recorded with an Onset U24 conductivity probe. Field observations of specific conductivity were made with a YSI Pro 30 handheld water quality instrument. Instrument readings of specific conductivity from the U24 were generally corrected to field observation unless noted.

I left in all short-lived spikes and drops of specific conductivity at various sites. I removed spikes at SEIMS and SEIMN from salt-tracer injection as part of a separate King County study.

See table below for comments on data quality and gaps in specific conductivity data.

Site	Notes
COUMO	**Poor record.** No gaps. Some large offsets between YSI observations and U24 instrument readings. U24 instrument generally reading below YSI. Lots of abrupt drops in summer, I believe this may be from landscaping irrigation (i.e., sprinkler) entering stream as they correspond with small spikes in water level record.
EVALSS	**Good record.** No gaps. Good agreement between YSI observations and U24 instrument readings.
EVAMS	**Fair record.** Gap in record from 6/28/19 15:15 to 7/23/19 09:15 due to battery failure in U24 logger. Otherwise good record.
MONMO	**Good record.** No gaps. From 1/1/19 00:00 to 1/17 15:45 flagged as warning - logger partially buried in sediment. Partially corrected by shifting to YSI observations but large offset. Otherwise record looks good.
MONMS	**Poor record.** No gaps. From 1/1/19 00:00 to 1/17 13:00 flagged as warning - big offsets between YSI observations and U24 instrument readings in that period. Added U24 logger to CB sump and began using that for record on 2/26/19. Better agreement between U24 and YSI observations after that. Some odd spikes between May and August that I left in record.
SEIMN	**Fair record.** From 6/5/19 12:15 to 7/23/19 14:30 in hourly due to instrument error when launching the device. Logger may be partially buried from 9/8/19 16:15 to 10/01/19 00:00, flagged as warning.
SEIMS	**Good record.** No gaps.
TOSMO	**Good record.** No gaps.
TYLMO	**Good record.** No gaps.

Water Temperature

Continuous water temperature was generally measured with a Campbell Scientific 109UL temperature probe. If alternative instruments were used, they are noted in the table. Field observations of water temperature were made with a YSI Pro 30 handheld water quality instrument. If consistent differences were observed, shifts in the continuous temperature record were made to better match YSI observations.

See table below for comments on data quality and gaps in water temperature data.

Site	Notes
COLM	**Good record**. Gap from 8/5 to 9/8 due to sensor being dry.
COUMI	**Good record.** No shifts or gaps.
COUMO	**Good record.** No shifts or gaps.
EVALSS	**Good record.** No shifts of gaps.
EVAMS	**Good record.** No shifts or gaps.
MONMN	**Fair record.** Ran with 0.1C offset through record. Temperature sensor may be affected by seep on left bank, though YSI observations and instrument readings never varied by more than 0.2C
MONMO	**Good record.** Used temperature reading from CS451 pressure transducer. Disregarded a 6/4 YSI observation that was +0.5C compared to instrument reading. Believe this might have been transcription error; all other YSI observation = instrument readings.
MONMS	**Fair record.** 15min interval because I used temperature reading from U20 logger in catch basin as it had best agreement with YSI observations in catch basin. Applied +0.1 C shift from 5/8 to 10/21 to better match YSI observations.
SEIMN	**Good record.** Instrument readings of water temp consistently 0.1C warmer than YSI observations. 0.1 C temperature correction applied to records.
SEIMS	**Good record.** No shifts or gaps.
TOSMI	**Good record.** No shifts or gaps.
TOSMO	**Good record.** No shifts or gaps.
TYLMI	**Good record**. No shifts or gaps.
TYLMO	**Good record.** No shifts or gaps.

Precipitation

Precipitation was measured using Hydrological Services TB6 tipping bucket rain gages. Rain gages were visited throughout the year (generally four times per year, seasonally) to ensure that they were free of debris and functionally correctly and their calibration checked (at least once per year). At the end of the calendar year, 5 minute rainfall data was compared to adjacent rain gages in the King County network to assess variability in the timing and magnitude of precipitation.

Precipitation falling as snow or hail was recorded at the time of melting (as opposed to at the time of falling) as the cones of the tipping bucket rain gages in this study were unheated.

See table below for comment on data quality and gaps in specific precipitation data. See Figure 2 in Appendix A for comparison to adjacent rain gages during the 2019 calendar year.

Site	Notes
RG_EVA	**Good record**. No gaps. Data from 2/5/19 to 2/12/19 influenced by snowfall.
RG_MON	**Good record**. No gaps. Data from 2/5/19 to 2/12/19 influenced by snowfall.
RG_TOS	**Good record**. No gaps. Data from 2/5/19 to 2/12/19 influenced by snowfall.

Discharge

Continuous stream discharge was calculated for each stream gage using a multi-step process. First, water level (stage) at the stream gage was measured continuously using a Campbell Scientific CS451 vented pressure transducer. This continuous stage record was then converted to volumetric stream discharge using a rating curve developed through a series of simultaneous measurements of stage and discharge. Discharge measurements in the field were taken using the velocity-area method (Herschy 1993), with a HACH FH950 velocity meter.

After ratings were established, small shifts were applied to the rating to account for small changes to the stage/discharge relationship. In the event of a dramatic change to the stage/discharge relationship, new ratings were developed through additional field measurements.

QA Review Methods

While all 14 project flow gages are updated via telemetry, ultimately the final continuous hydrologic data is input into the King County Hydrologic database with a supervised process using a desktop computer application. The technician works from a plot (printed chart created in a spreadsheet) of the continuous values for a set period, usually four to eight weeks and bracketed by field observations. For discharge data, the water level corrections, rating table and shifts used are noted on the plot, along with explanatory notes. The plot is stored in the project file for the gage along with field notes and other materials. Rating curve development and gage problem solving occurs in a collegial environment with the team staff. Recorded data and field measurements are reviewed throughout the year to identify problems and target necessary measurements.

Annual review of the water year is performed after the final supervised workup. Data are reviewed by a different team member than who performed the initial workup.[1] A spreadsheet template is used with daily mean, max and min values, rainfall, comparison gages, field

[1] Due to time and staffing constraints, review of discharge data by another technician was not performed for data in the 2019 calendar year. Review was performed by the field technician.

observations, and a QC checklist to structure the review. The review process is described in the STREAM GAGE DATA WORKUP QA/QC section in Appendix B.

RPWS Calendar Year 2019

Rainfall totals were near average to slightly below in the Redmond, WA area due to a relatively dry winter and spring. Summer (July through August) was relatively wet, including an event on 9/9/2019 that totaled 2.20" at the Monticello rain gage. The largest event occurred on between 12/19/2019 and 12/21/2019 with 24-hour rainfall totals exceeding 3.0", an approximate 25-year 24-hour precipitation total (King County 2016).

The ten largest 24-hour rain totals from the Monticello rain gage are listed below for the 2019 calendar year with direct measurements of stream discharge were made during the shaded in yellow:

End Date	24-Hr. Total (Inches)
12/20/2019	3.16
9/9/2019	2.20
12/21/2019	1.45
9/8/2019	1.28
3/12/2019	1.13
10/19/2019	1.03
11/15/2019	1.00
1/4/2019	0.99
10/22/2019	0.93
2/13/2019	0.87

Discharge measurements taken on 1/30/2020, 2/3/2020, and 2/6/2020 were also used to develop and refine ratings used to calculate continuous discharge for the 2019 calendar year. Rainfall totals on those days were 0.15", 0.09", and 2.57" at the Monticello rain gage, respectively.

Missing Data

Missing 5-minute discharge data may be the result of technical issues with the gage (e.g., power failure, sensor failure) or dramatic changes to the stage/discharge relationship that cannot be accounted for with an adjustment to the discharge rating curve. In the case of technical issues, 15-minute data from non-vented U20 pressure transducers were used to fill gaps where possible. See table below for a summary of missing discharge data by station.

Site	Notes
COLM	Periods of no flow begging 7/22/19 to 9/14/19
COUMI	Data from 7/16/19 12:00 to 7/23/19 16:00 in 15min interval because used U20 for this period; CS451 probe giving bad readings due to sediment.
COUMO	None
EVALSS	None
EVAMS	None
MONMN	None
MONMO	None
MONMS	None
SEIMN	None
SEIMS	In 15 min interval from 4/5/19 11:45 to 10/31/19 14:15 -used U20 data rather than CS451. Lots of noise in CS451 record during this period - not terrible but U20 record better. Flushed well and cleaned probe on 10/31 and improved problem.
TOSMI	No data from 2/12/19 07:05 to 2/24/19 12:00. Lots of downed branches over channel at control backing up water. Baseflow likely unaffected but way too much water in channel during storms using a shifted rating. Any attempt to generate flow during this period is an estimate at best.
TOSMO	None
TYLMI	None
TYLMO	None

Questionable Data

Given the indirect nature of discharge data development, there are many sources of uncertainty in this process, including:

Inaccuracy of field measurements of stage and discharge
Inaccuracy of continuous stage measurements
A rating table that poorly represents the stage/discharge relationship at the full range of stream discharge that a given stream conveys in a given time period
Changes to the stage/discharge relationship, including:

- Scour and/or fill of the stream bed during storm events
- Vegetation growth on banks or in channel
- Debris accumulating in the section of the stream channel that controls water level at the stream gage

The following table summarizes by station data with notable uncertainty due to the reasons listed above.

Site	Notes
COLM	Data from 2/12/19 to 2/26/19 flagged with W - wet snow downs branches onto channel in section control affecting stage/discharge relationship. Applied large shift but should be viewed as estimate. Some larger rating shifts in the fall but makes sense with baseflow and field observations.
COUMI	Big shifts between 10/1/19 and 10/31/19. Control very unstable. Rebuilt section control on 10/31/19. Large storm peak on 12/20/19 - 12/21/19 questionable. Peak of hydrograph a little flat - I had always assumed this was a product of a wave dynamic at gage that caused continuous water level readings to plateau. In previous years I had omitted the continuous data and estimated a peak for daily values. However, after being in the field on 12/20/19, I noticed the flow pulsing out of the culvert upstream of the gage - clearly periods of lower flow out of culvert. Possibly due to a flow control structure upstream? In any case, I'm leaving the continuous data in this time but flagging it with W. A few periods during spring/summer of 2019 where discharge at COUMI => than COUMO. Very doubtful that there would actually be more water there except during rising limb of storm event. Tried to correct by disregarding a few measurements to keep more water in channel at COUMO and less at COUMI but didn't want to deviate too far from measured flows. Ultimately this may be a function of the low resolution of recorded water level at summer baseflow due to wide channel.
COUMO	A few periods during spring/summer of 2019 where discharge at COUMI => than COUMO. Very doubtful that there would actually be more water there except during rising limb of storm event. Tried to correct by disregarding a few measurements to keep more water in channel at COUMO and less at COUMI but didn't want to deviate too far from measured flows. Ultimately this may be a function of the low resolution of recorded water level at summer baseflow due to wide channel. Lots of little shifts from 9/24/19 to 11/23/19 due to leaves on control. Tried to keep baseflow discharge as reasonable as possible.
EVALSS	All data after 12/20/19. Big scour during 12/20/19 storm - obvious during field visit and in baseflow record. Required moderate rating shift to accommodate. Ran data from 12/20/19 to end of calendar year with Rating #4. Feel better about EVALSS than EVAMS because scour smaller and have good flow measurement on 12/20/19.
EVAMS	All data after 12/20/19. Big scour during 12/20/19 storm - obvious during field visit and in baseflow record. Required big rating shift to accommodate. Ran data from 12/20/19 to end of calendar year with Rating #4 with a big shift which is more estimate than solid data. Also, period of increasing slightly increasing baseflow from 6/22/19 to 7/18/19 after storms. Not due to rating shift, very slight increases in stage instrument reading after storms in this period. Doubtful discharge is actually increasing, probably slight aggradation of control but not visible in field or verified by flow measurement
MONMN	Some oddly dampened storm peaks at MONMN from mid-June 2019 to mid-August 2019 relative to _MO and _MS. Not sure why so little water there - not due to rating, in stage record. Perhaps stormwater controls or diversion from construction in watershed. 12/20/19 storm peak odd. Big dip during peak of storm that doesn't match with other Monticello stations and rainfall. May be due to abrupt change at control. Q measurements after 12/20 don't indicate scour, but fill after 12/20 storm as do field observations. Rating #9t created to account for M#50 during 12/20 storm peak. Data from 12/20/19 to end of calendar year 2019 more questionable.

Site	Notes
MONMO	Moderate shift on 3/12/19 storm peak to match Q measurement. 12/20/19 storm pushed a lot of gravel into gaging pool behind last weir and buried instruments. Instrument readings look OK but unclear as to how/if it will affect rating. Gravel still below weir notch. Conceptually would potentially make culvert less efficient and shift to left but haven't seen that in Q measurements.
MONMS	Some debris on control but easy to correct. Switch to Rating #04 at on 1/17/19 - very similar to Rating #03, slightly more efficient, better fit to more recent data.
SEIMN	Lots of debris on weir cleared on 1/15/19. Cleared and shifted rating to account for change in stage/discharge relationship. Small shifts during spring, summer, early fall. This data probably fair. Larger rating shifts during wet season to account for gravel on weir ramp, probably poor.
SEIMS	Summer baseflows (late July to early Sept) a bit lower than previous years - didn't take flow measurement in this period so can't verify. No rating shifts applied during this period so not due to that.
TOSMI	Didn't shift rating to match discharge measurement on 10/21/19 - nothing obviously wrong with measurement but plots to right of rating (measurements before and after plot to left). Puts way too much water in channel relative to TOSMO. I Trust TOSMO discharge much more than TOSMI so reran without shifting.
TOSMO	Odd drop in baseflow from 10/12/19 to 10/15/19 - think due to lack of resolution in low end of rating.
TYLMI	2/12/19 12:10 - 2/26/19 11:50 - snow pushed downed limbs into channel at control. Required big shift to compensate, should be treated as estimate. Big shifts on 12/20/19 storm. Peak questionable especially with debris on control that was removed during flow measurement. The storm hydrograph at TYLMI has always struck me as odd, seems muted compared to TYLMO which looks very flashy. Instances where more water at TYLMI than TYLMO on storm recession which is theoretically possible but strikes me as odd. Some cases where baseflow at TYLMI >= baseflow at TYLMO. Tried to adjust to keep more water at TYLMO but didn't want to deviate too far from field measurements. Likely due to low resolution with that little water in stream (<0.1 cfs).
TYLMO	Lots of shifts between 9/7/19 to 10/21/19 to account for debris on control. Big scour on 12/19/19 - 12/21/19 storm. Had to make big shift to accommodate. Data from 12/19/19 to end of calendar more questionable.

Data Rating

Continuous discharge data from each station was given a rating, from poor to good, for the 2019 calendar year. Good data had a complete record through the period, a good number (8 – 10) of field observations at both low and high discharge conditions, and a consistent stage/discharge relationship due to a very stable or engineered “control” (i.e., objects in a stream channel that control the water level at the stream gage). Poor data were usually characterized a very unstable control that caused numerous rating shifts to accommodate. Extended periods where debris such as leaves, algae, or wood accumulated on controls also negatively affected the data rating as did the lack of a recent high flow or summer low flow measurement (see Figure 3 in Appendix A for a table comparing measured vs. calculated discharge values for each station).

Site	Notes
COLM	**Fair to poor record**. Most data fair except for 2/12/19 to 2/26/2019 which is poor. Several shifts. Rating #4 better. A more recent high flow measurement needed.
COUMI	**Poor record**. Section control very unstable, especially from September to December 2019. Some big shifts. Rating #08t temporary and based on few flow measurements.
COUMO	**Fair to poor record.** Natural control - some small fluctuations with gravel and debris but limited larger shifts. Rating #06 better than Rating #5. A more recent high flow measurement needed.
EVALSS	**Fair to good record**. Good before 12/20 storm. After 12/20 storm fair at best.
EVAMS	**Fair record**. Up to 12/20/19 fair to good - natural control but fairly stable. Some shall shifts during year, including fall to account for leaves on control. Data from 12/20 to end of year poor.
MONMN	**Fair to poor record**. Natural control; Rating #8 mostly solid through CY2019 until 12/20. Rating #9t based on few measurements, needs further developed, especially at high end.
MONMO	**Good record**. Engineered control in weir plate is stable, relatively little debris in notch.
MONMS	**Good record.** Engineered control in CB outlet pipe invert. Rating #4 better than #3.
SEIMN	**Fair to poor record**. Rating #07x fair to good when weir ramp is clear of gravel but gravel builds up frequently and needs cleared, especially during wet season. Occasional debris.
SEIMS	**Good record.** Engineered control, minimal shifts.
TOSMI	**Fair record**. Natural control mostly stable but lots of little shift. Good amount of flow measurements including high flows.
TOSMO	**Fair to good record**. Engineered control and good range in flow measurements. Some small shifts due to debris and gravel buildup between gage and weir but otherwise rating #2 solid.
TYLMI	**Poor record.** Natural control unstable - lots of shifts due to debris and scour/deposition. Need high flow measurement for recent ratings.
TYLMO	**Fair record.** Engineered control but gravel changes and debris between gage and weir plate. Big scour on 12/19/19 - 12/21/19 storm.

REFERENCES

Herschy, R.W. 1993. The velocity–area method, Flow Meas. Instrum., 4(1), 7–10.

King County. 2016. King County Surface Water Design Manual. King County Department of Natural Resources and Parks. Seattle, Washington.

APPENDIX A: ADDITIONAL TABLES AND FIGURES

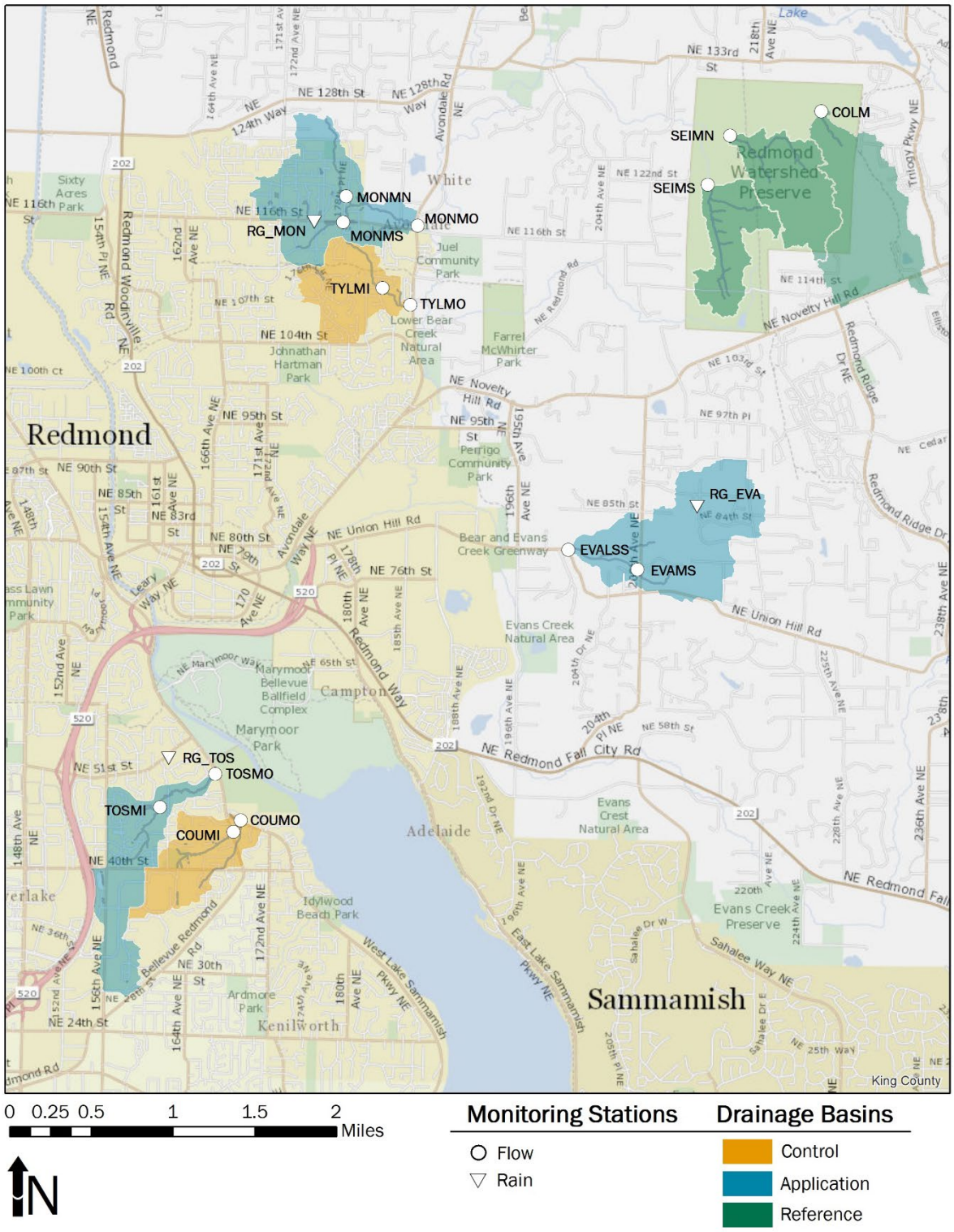


Figure 1 | A map of RPWS hydrologic monitoring sites.

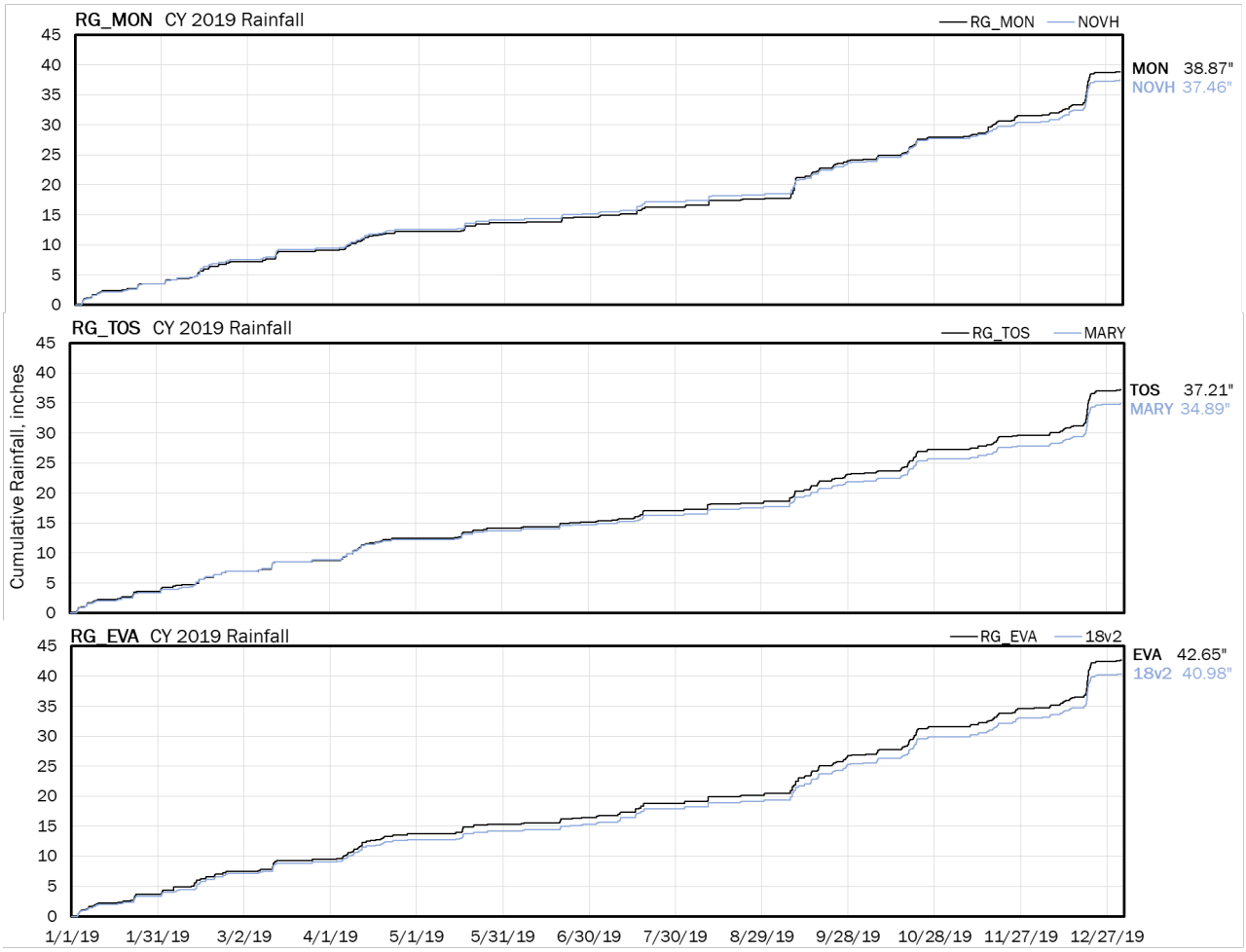


Figure 2 | Comparison of RPWS rain gages to nearby rain gages in King County's hydrologic monitoring program.

Site	Max Discharge Measurement 7/1/2018–2/6/2020* (cubic feet per second (cfs))	Max Discharge Measurement 9/1/2015–2/6/2020** (cubic feet per second (cfs))	Max Discharge Record in Session 10/1/2018–12/31/2019 (cubic feet per second (cfs))
COLM	4.72	16.2	20.5
COUMI	2.33	5.7	2.06
COUMO	8.17	15.4	20.6
EVALSS	22.8	22.8	24.8
EVAMS	6.45	7.09	10.1
MONMN	9.41	16.3	26.4
MONMO	22.8	28.3	44.0
MONMS	2.75	3.61	4.52
SEIMN	1.18	6.32	8.32
SEIMS	1.03	8.63	8.49
TOSMI	10.5	13.8	11.2
TOSMO	9.35	14.0	16.1
TYLMI	2.65	2.91	6.08
TYLMO	9.02	10.91	6.51

* Time period where flow measurements were taken to develop ratings used to develop data from 10/1/2018 to 12/31/2019.

** Length of time from start of RPWS project to most recent measurements.

Figure 3 | Table of maximum discharge measurements (for differing time periods) and maximum calculated discharge record. Maximum calculated discharge record in session values are highlighted in yellow if they are more than two times the maximum volume measured in the field during the time period used to develop the current stage/discharge ratings and highlighted in red if the values is double the volume ever measured in the field during the entirety of the RPWS project. Note that SEIMN and SEIMS both have engineered controls and older high flow measurements are still valuable.

APPENDIX B: STREAM GAGE DATA WORKUP QA/QC DESCRIPTION

A streamflow data workup should be checked by another technician before approving the data for publication. This is not a rote process or simple checklist. It requires an understanding of the basic elements of a data workup as well as a questioning attitude. The check can go pretty quickly if the person doing the original workup has taken good notes, kept the file in good order, made the necessary graphs and reports, and did not make any mistakes. The QA/QC check should be performed by someone other than the person who did the original workup. This ensures that we get a realistic assessment of the coherence and legibility of the workup and documentation. We want to be able to return to the file at a later date and figure out how the flow data were derived from the primary data. We also want to make sure that the data make sense and contain no errors. Of course we will never know if our flow data are accurate, but we can know that they are the best numbers possible if rating tables are well developed and the rating properly applied to a carefully corrected stage record. The following steps are outlined in the order they should occur.

Three Objectives

1. Well documented work, so in the future we can figure out what was done and why. If the file and notes are a mess and don't make sense, you give it back and tell them to get it together.
2. Careful work, i.e. no stupid or gross mistakes. No gaps, no big jumps in discharge when there shouldn't be, flow in data table matches the discharge measurement made at that time, sensor garbage is cleaned up. Stupid mistake example: the flow record changes 15% in one log between sessions because the initial sensor correction was set incorrectly.
3. Technically defensible work, no errors in judgment. Rating curves make sense, stage corrections are reasonable, rating shifts applied appropriately, estimated periods make sense.

QA/QC steps to checking flow records

Documentation

There may be some minor problems with the file organization that did not affect the workup quality. These the checker can fix. Make sure that:

The paper file is organized correctly
There is a workup cover sheet with session by session notes
Workup charts are all there and gaps noted, workup detail is written on the chart
Discharge Measurement Summary form is up to date
Flows are correctly plotted on rating curve
Data input files are stored correctly
Water year QA spreadsheet is complete (use StreamGage_WaterYear_Report.xlsx template). Charts titles should be correct, rain gage and comparison gage data included, also any continuous water temperature or other water quality data if applicable.

Look for Mistakes

Is water year complete? Complete 15 minute years have 35,040 records, leap years 35,136 (5 minute have 105,120). Missing data will reduce that number. The logs for the year are displayed on the workup screen. Also, missing data will be held with asterisks in the 15-minute report. Dump the report into excel and sort by value.

Compare the graph of the daily mean and max flow to that of an equivalent gage. You're looking at the timing and relative magnitude of peaks and low flow periods.

Examine daily mean and min flows chart. You're looking for periods where the flow drops unrealistically, usually due to sensor problems, a negative value, or a mistaken filled value.

Check the data table at date and time of discharge measurements. The record should match the flow or there should be a good reason why in the notes.

Check the plotting of each flow measurement on the rating curve. Sometimes the offset is incorrectly added or just it's just put in the wrong place. It can look right and be wrong, so check.

Give flow measurements a once over to make sure they are sensible, V*A = Q, the calculated width seems right given the start and end of the cross section. Pay special attention to high flow measurements or any flow that shifts off the normal rating.

Does the flow record connect well? No unjustified jumps in the discharge between sessions, stage corrections or other events.

Are estimate periods flagged correctly?

Technical Quality

Can you understand what rating curves were used, and what they are based on? What defines the high end?

If the high end depends on a curve extension, are there indirect discharge calculations made to justify the peak flow estimate? Do you agree? This is a highly subjective area that bears careful examination. We expect, of course, that consultation was done during the initial workup, so there will be no big surprises.

Are base flows accurate? It may be more accurate to estimate low flow periods or fill the stage record than use stage record with known error.

Check how daily flow estimates to fill gaps were made.

Compare mean daily discharge with an appropriate nearby station for timing and magnitude of peaks, baseflow etc.

Final Approval

If everything is in order, or after corrections have been made, complete QC checklist sheet in the Water Year spreadsheet. Printout checklist for the paper file. Include name and date.

APPENDIX C

Discharge Rating Tables

Table C-1. Rating Table Used to Estimate Discharge at EVALSS.

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.12	0.60
0.13	0.71
0.14	0.82
0.15	0.95
0.16	1.08
0.17	1.22
0.18	1.38
0.19	1.54
0.20	1.71
0.21	1.89
0.22	2.08
0.23	2.27
0.24	2.48
0.25	2.70
0.26	2.92
0.27	3.16
0.28	3.40
0.29	3.65
0.30	3.91
0.31	4.17
0.32	4.45
0.33	4.73
0.34	5.03
0.35	5.33
0.36	5.64
0.37	5.96
0.38	6.29
0.39	6.63
0.40	6.98
0.41	7.33
0.42	7.70
0.43	8.07
0.44	8.45
0.45	8.84
0.46	9.24
0.47	9.65
0.48	10.07
0.49	10.50
0.50	10.93
0.51	11.38
0.52	11.83
0.53	12.30
0.54	12.77
0.55	13.25

Table C-1. Rating Table Used to Estimate Discharge at EVALSS.

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.56	13.74
0.57	14.24
0.58	14.74
0.59	15.26
0.60	15.79
0.61	16.32
0.62	16.87
0.63	17.42
0.64	17.98
0.65	18.55
0.66	19.13
0.67	19.72
0.68	20.31
0.69	20.92
0.70	21.54
0.71	22.16
0.72	22.79
0.73	23.44
0.74	24.09
0.75	24.75
0.76	25.42
0.77	26.10
0.78	26.78
0.79	27.48
0.80	28.18
0.81	28.90
0.82	29.62
0.83	30.35
0.84	31.10
0.85	31.85
0.86	32.60
0.87	33.37
0.88	34.15
0.89	34.94
0.90	35.73
0.91	36.54
0.92	37.35
0.93	38.17
0.94	39.00
0.95	39.84
0.96	40.69
0.97	41.55
0.98	42.42
0.99	43.30

Table C-1. Rating Table Used to Estimate Discharge at EVALSS.

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.00	44.18
1.01	45.08
1.02	45.98
1.03	46.89
1.04	47.81
1.05	48.75
1.06	49.68
1.07	50.63
1.08	51.59
1.09	52.56
1.10	53.53
1.11	54.52
1.12	55.51
1.13	56.52
1.14	57.53
1.15	58.55
1.16	59.58
1.17	60.62
1.18	61.67
1.19	62.73
1.20	63.79
1.21	64.87
1.22	65.95
1.23	67.05
1.24	68.15
1.25	69.26
1.26	70.38
1.27	71.51
1.28	72.65
1.29	73.80
1.30	74.95
1.31	76.12
1.32	77.30
1.33	78.48
1.34	79.67
1.35	80.88
1.36	82.09
1.37	83.31
1.38	84.54
1.39	85.78
1.40	87.02
1.41	88.28
1.42	89.55

Table C-1. Rating Table Used to Estimate Discharge at EVALSS.

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.43	90.82
1.44	92.11
1.45	93.40
1.46	94.70
1.47	96.01
1.48	97.33
1.49	98.66
1.50	100.00

Table C-2. Rating Table Used to Estimate Discharge at EVAMS.

EVAMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.13	0.10
0.14	0.13
0.15	0.17
0.16	0.21
0.17	0.26
0.18	0.32
0.19	0.39
0.20	0.47
0.21	0.57
0.22	0.67
0.23	0.79
0.24	0.92
0.25	1.06
0.26	1.22
0.27	1.40
0.28	1.60
0.29	1.74
0.30	1.90
0.31	2.06
0.32	2.22
0.33	2.40
0.34	2.58
0.35	2.78
0.36	2.98
0.37	3.18
0.38	3.40
0.39	3.63
0.40	3.86
0.41	4.10
0.42	4.35
0.43	4.61
0.44	4.88
0.45	5.16
0.46	5.45
0.47	5.75
0.48	6.05
0.49	6.37
0.50	6.69
0.51	7.03
0.52	7.38
0.53	7.73
0.54	8.10
0.55	8.47
0.56	8.86
0.57	9.25
0.58	9.66
0.59	10.07
0.60	10.50

Table C-2. Rating Table Used to Estimate Discharge at EVAMS.

EVAMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.61	11.00
0.62	11.51
0.63	12.04
0.64	12.58
0.65	13.14
0.66	13.72
0.67	14.31
0.68	14.92
0.69	15.54
0.70	16.18
0.71	16.84
0.72	17.51
0.73	18.20
0.74	18.91
0.75	19.63
0.76	20.38
0.77	21.14
0.78	21.92
0.79	22.71
0.80	23.53
0.81	24.36
0.82	25.22
0.83	26.09
0.84	26.98
0.85	27.89
0.86	28.82
0.87	29.77
0.88	30.74
0.89	31.73
0.90	32.74
0.91	33.77
0.92	34.82
0.93	35.90
0.94	36.99
0.95	38.10
0.96	39.24
0.97	40.40
0.98	41.58
0.99	42.78

Table C-3. Rating Curve Used to Estimate Discharge at MONM.

MONM Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.01	0.01
0.02	0.02
0.03	0.03
0.04	0.04
0.05	0.04
0.06	0.05
0.07	0.06
0.08	0.07
0.09	0.08
0.10	0.08
0.11	0.09
0.12	0.10
0.13	0.12
0.14	0.15
0.15	0.18
0.16	0.21
0.17	0.24
0.18	0.28
0.19	0.32
0.20	0.36
0.21	0.41
0.22	0.46
0.23	0.51
0.24	0.57
0.25	0.63
0.26	0.70
0.27	0.77
0.28	0.84
0.29	0.92
0.30	1.00
0.31	1.09
0.32	1.18
0.33	1.28
0.34	1.39
0.35	1.49
0.36	1.61
0.37	1.73
0.38	1.85
0.39	1.98
0.40	2.12
0.41	2.26
0.42	2.40
0.43	2.55
0.44	2.71
0.45	2.87
0.46	3.04
0.47	3.22
0.48	3.40

Table C-3. Rating Curve Used to Estimate Discharge at MONM.

MONM Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.49	3.59
0.50	3.78
0.51	3.98
0.52	4.19
0.53	4.40
0.54	4.62
0.55	4.85
0.56	5.08
0.57	5.32
0.58	5.57
0.59	5.82
0.60	6.08
0.61	6.35
0.62	6.62
0.63	6.91
0.64	7.19
0.65	7.49
0.66	7.79
0.67	8.11
0.68	8.42
0.69	8.75
0.70	9.09
0.71	9.43
0.72	9.78
0.73	10.13
0.74	10.50
0.75	10.81
0.76	11.13
0.77	11.45
0.78	11.78
0.79	12.12
0.80	12.45
0.81	12.80
0.82	13.15
0.83	13.50
0.84	13.83
0.85	14.16
0.86	14.49
0.87	14.83
0.88	15.17
0.89	15.52
0.90	15.87
0.91	16.22
0.92	16.58
0.93	16.94
0.94	17.30
0.95	17.67
0.96	18.05

Table C-3. Rating Curve Used to Estimate Discharge at MONM.

MONM Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.97	18.42
0.98	18.80
0.99	19.19
1.00	19.58
1.01	19.97
1.02	20.37
1.03	20.77
1.04	21.17
1.05	21.58
1.06	21.99
1.07	22.41
1.08	22.83
1.09	23.25
1.10	23.68
1.11	24.11
1.12	24.54
1.13	24.98
1.14	25.43
1.15	25.87
1.16	26.32
1.17	26.78
1.18	27.24
1.19	27.70
1.20	28.17
1.21	28.64
1.22	29.11
1.23	29.59
1.24	30.07
1.25	30.56
1.26	31.05
1.27	31.54
1.28	32.04
1.29	32.54
1.30	33.04
1.31	33.55
1.32	34.06
1.33	34.58
1.34	35.10
1.35	35.63
1.36	36.15
1.37	36.69
1.38	37.22
1.39	37.76
1.40	38.31
1.41	38.86
1.42	39.41
1.43	39.96

Table C-3. Rating Curve Used to Estimate Discharge at MONM.

MONM Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.44	40.52
1.45	41.08
1.46	41.65
1.47	42.22
1.48	42.80
1.49	43.38
1.50	43.96
1.51	44.55
1.52	45.14
1.53	45.73
1.54	46.33
1.55	46.93
1.56	47.54
1.57	48.15
1.58	48.76
1.59	49.38
1.60	50.00

Table C-4. Rating Tables Used to Estimate Discharge at MONMN.

MONMN Rating Table 07		MONMN Rating Table 08		MONMN Rating Table 09	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.24	0.02	0.22	0.02	0.15	0.01
0.25	0.03	0.23	0.03	0.16	0.01
0.26	0.03	0.24	0.03	0.17	0.01
0.27	0.04	0.25	0.05	0.18	0.01
0.28	0.05	0.26	0.06	0.19	0.02
0.29	0.06	0.27	0.07	0.20	0.02
0.30	0.07	0.28	0.09	0.21	0.02
0.31	0.09	0.29	0.12	0.22	0.02
0.32	0.11	0.30	0.15	0.23	0.03
0.33	0.13	0.31	0.18	0.24	0.03
0.34	0.15	0.32	0.22	0.25	0.05
0.35	0.18	0.33	0.25	0.26	0.06
0.36	0.21	0.34	0.28	0.27	0.07
0.37	0.25	0.35	0.32	0.28	0.09
0.38	0.29	0.36	0.36	0.29	0.12
0.39	0.34	0.37	0.41	0.30	0.15
0.40	0.40	0.38	0.45	0.31	0.18
0.41	0.46	0.39	0.51	0.32	0.22
0.42	0.53	0.40	0.56	0.33	0.25
0.43	0.61	0.41	0.62	0.34	0.28
0.44	0.69	0.42	0.69	0.35	0.32
0.45	0.79	0.43	0.76	0.36	0.36
0.46	0.90	0.44	0.84	0.37	0.41
0.47	1.02	0.45	0.92	0.38	0.45
0.48	1.15	0.46	1.01	0.39	0.51
0.49	1.30	0.47	1.11	0.40	0.56
0.50	1.37	0.48	1.21	0.41	0.62
0.51	1.45	0.49	1.32	0.42	0.69
0.52	1.53	0.50	1.44	0.43	0.76
0.53	1.61	0.51	1.57	0.44	0.84
0.54	1.70	0.52	1.70	0.45	0.92
0.55	1.79	0.53	1.78	0.46	1.01
0.56	1.88	0.54	1.86	0.47	1.11
0.57	1.97	0.55	1.95	0.48	1.21
0.58	2.07	0.56	2.04	0.49	1.32
0.59	2.17	0.57	2.13	0.50	1.44
0.60	2.27	0.58	2.22	0.51	1.57
0.61	2.38	0.59	2.31	0.52	1.70
0.62	2.49	0.60	2.41	0.53	1.78
0.63	2.60	0.61	2.51	0.54	1.86
0.64	2.72	0.62	2.61	0.55	1.95
0.65	2.84	0.63	2.71	0.56	2.04
0.66	2.96	0.64	2.82	0.57	2.13
0.67	3.08	0.65	2.93	0.58	2.22
0.68	3.21	0.66	3.04	0.59	2.31
0.69	3.34	0.67	3.15	0.60	2.41
0.70	3.48	0.68	3.27	0.61	2.51
0.71	3.62	0.69	3.39	0.62	2.61

Table C-4. Rating Tables Used to Estimate Discharge at MONMN.

MONMN Rating Table 07		MONMN Rating Table 08		MONMN Rating Table 09	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.72	3.76	0.70	3.51	0.63	2.71
0.73	4.02	0.71	3.63	0.64	2.82
0.74	4.29	0.72	3.76	0.65	2.93
0.75	4.58	0.73	4.02	0.66	3.04
0.76	4.88	0.74	4.29	0.67	3.15
0.77	5.20	0.75	4.58	0.68	3.27
0.78	5.53	0.76	4.88	0.69	3.39
0.79	5.88	0.77	5.20	0.70	3.51
0.80	6.25	0.78	5.53	0.71	3.63
0.81	6.63	0.79	5.88	0.72	3.76
0.82	7.04	0.80	6.25	0.73	3.93
0.83	7.46	0.81	6.63	0.74	4.10
0.84	7.90	0.82	7.04	0.75	4.27
0.85	8.37	0.83	7.46	0.76	4.45
0.86	8.85	0.84	7.90	0.77	4.64
0.87	9.36	0.85	8.37	0.78	4.83
0.88	9.89	0.86	8.85	0.79	5.03
0.89	10.45	0.87	9.36	0.80	5.23
0.90	11.02	0.88	9.89	0.81	5.44
0.91	11.63	0.89	10.45	0.82	5.65
0.92	12.26	0.90	11.02	0.83	5.87
0.93	12.91	0.91	11.63	0.84	6.10
0.94	13.59	0.92	12.26	0.85	6.33
0.95	14.31	0.93	12.91	0.86	6.56
0.96	15.05	0.94	13.59	0.87	6.81
0.97	15.82	0.95	14.31	0.88	7.06
0.98	16.62	0.96	15.05	0.89	7.31
0.99	17.45	0.97	15.82	0.90	7.57
1.00	18.32	0.98	16.62	0.91	7.84
1.01	19.22	0.99	17.45	0.92	8.11
1.02	20.15	1.00	18.32	0.93	8.39
1.03	21.12	1.01	19.22	0.94	8.68
1.04	22.13	1.02	20.15	0.95	8.97
1.05	23.17	1.03	21.12	0.96	9.27
1.06	24.26	1.04	22.13	0.97	9.57
1.07	25.38	1.05	23.17	0.98	9.89
1.08	26.55	1.06	24.26	0.99	10.21
1.09	27.75	1.07	25.38	1.00	10.53
1.10	29.00	1.08	26.55	1.01	10.87
		1.09	27.75	1.02	11.21
		1.10	29.00	1.03	11.56
		1.02	20.15	1.04	11.91
		1.03	21.12	1.05	12.28
		1.04	22.13	1.06	12.65
		1.05	23.17	1.07	13.02
		1.06	24.26	1.08	13.41
		1.07	25.38	1.09	13.80
		1.08	26.55	1.10	14.20
		1.09	27.75	1.11	14.61
		1.10	29.00	1.12	15.03
				1.13	15.46

Table C-4. Rating Tables Used to Estimate Discharge at MONMN.

MONMN Rating Table 07		MONMN Rating Table 08		MONMN Rating Table 09	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
				1.14	15.89
				1.15	16.33
				1.16	16.78
				1.17	17.24
				1.18	17.70
				1.19	18.18
				1.20	18.66
				1.21	19.15
				1.22	19.65
				1.23	20.16
				1.24	20.68
				1.25	21.21
				1.26	21.75
				1.27	22.29
				1.28	22.85
				1.29	23.41
				1.30	23.99
				1.31	24.57
				1.32	25.16
				1.33	25.77
				1.34	26.38
				1.35	27.00

Table C-5. Rating Tables Used to Estimate Discharge at MONMS.

MONMS Rating Table 03		MONMS Rating Table 04	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.09	0.01	0.09	0.01
0.10	0.01	0.10	0.01
0.11	0.02	0.11	0.02
0.12	0.02	0.12	0.03
0.13	0.03	0.13	0.04
0.14	0.04	0.14	0.05
0.15	0.05	0.15	0.06
0.16	0.06	0.16	0.08
0.17	0.07	0.17	0.09
0.18	0.08	0.18	0.10
0.19	0.09	0.19	0.11
0.20	0.10	0.20	0.13
0.21	0.11	0.21	0.14
0.22	0.12	0.22	0.15
0.23	0.14	0.23	0.17
0.24	0.15	0.24	0.18
0.25	0.16	0.25	0.20
0.26	0.18	0.26	0.21
0.27	0.19	0.27	0.23
0.28	0.21	0.28	0.25
0.29	0.22	0.29	0.27
0.30	0.24	0.30	0.28
0.31	0.26	0.31	0.30
0.32	0.27	0.32	0.32
0.33	0.29	0.33	0.35
0.34	0.31	0.34	0.37
0.35	0.33	0.35	0.39
0.36	0.35	0.36	0.41
0.37	0.37	0.37	0.43
0.38	0.40	0.38	0.46
0.39	0.42	0.39	0.48
0.40	0.44	0.40	0.51
0.41	0.47	0.41	0.53
0.42	0.49	0.42	0.56
0.43	0.52	0.43	0.59
0.44	0.54	0.44	0.62
0.45	0.57	0.45	0.65
0.46	0.60	0.46	0.67
0.47	0.62	0.47	0.70
0.48	0.65	0.48	0.74
0.49	0.68	0.49	0.77
0.50	0.71	0.50	0.80
0.51	0.74	0.51	0.83
0.52	0.77	0.52	0.86
0.53	0.81	0.53	0.90
0.54	0.84	0.54	0.93
0.55	0.87	0.55	0.97
0.56	0.91	0.56	1.00

Table C-5. Rating Tables Used to Estimate Discharge at MONMS.

MONMS Rating Table 03		MONMS Rating Table 04	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.57	0.94	0.57	1.04
0.58	0.98	0.58	1.08
0.59	1.01	0.59	1.12
0.60	1.05	0.60	1.15
0.61	1.09	0.61	1.19
0.62	1.13	0.62	1.23
0.63	1.17	0.63	1.27
0.64	1.21	0.64	1.31
0.65	1.25	0.65	1.36
0.66	1.29	0.66	1.40
0.67	1.33	0.67	1.44
0.68	1.37	0.68	1.49
0.69	1.42	0.69	1.53
0.70	1.46	0.70	1.58
0.71	1.51	0.71	1.62
0.72	1.55	0.72	1.67
0.73	1.60	0.73	1.72
0.74	1.65	0.74	1.76
0.75	1.70	0.75	1.81
0.76	1.74	0.76	1.86
0.77	1.79	0.77	1.91
0.78	1.84	0.78	1.96
0.79	1.89	0.79	2.01
0.80	1.95	0.80	2.06
0.81	2.00	0.81	2.12
0.82	2.05	0.82	2.17
0.83	2.11	0.83	2.22
0.84	2.16	0.84	2.28
0.85	2.22	0.85	2.33
0.86	2.27	0.86	2.39
0.87	2.33	0.87	2.44
0.88	2.39	0.88	2.50
0.89	2.44	0.89	2.56
0.90	2.50	0.90	2.62
0.91	2.56	0.91	2.68
0.92	2.62	0.92	2.74
0.93	2.69	0.93	2.80
0.94	2.75	0.94	2.86
0.95	2.81	0.95	2.92
0.96	2.87	0.96	2.98
0.97	2.94	0.97	3.04
0.98	3.00	0.98	3.11
0.99	3.07	0.99	3.17
1.00	3.14	1.00	3.24
1.01	3.20	1.01	3.30
1.02	3.27	1.02	3.37
1.03	3.34	1.03	3.44
1.04	3.41	1.04	3.50

Table C-5. Rating Tables Used to Estimate Discharge at MONMS.

MONMS Rating Table 03		MONMS Rating Table 04	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
1.05	3.48	1.05	3.57
1.06	3.55	1.06	3.64
1.07	3.63	1.07	3.71
1.08	3.70	1.08	3.78
1.09	3.77	1.09	3.85
1.10	3.85	1.10	3.93
1.11	3.92	1.11	4.00
1.12	4.00	1.12	4.07
1.13	4.08	1.13	4.14
1.14	4.15	1.14	4.22
1.15	4.23	1.15	4.29
1.16	4.31	1.16	4.37
1.17	4.39	1.17	4.45
1.18	4.47	1.18	4.52
1.19	4.55	1.19	4.60
1.20	4.63	1.20	4.68
1.21	4.72	1.21	4.76
1.22	4.80	1.22	4.84
1.23	4.89	1.23	4.92
1.24	4.97	1.24	5.00
1.25	5.06	1.25	5.08
1.26	5.14	1.26	5.16
1.27	5.23	1.27	5.25
1.28	5.32	1.28	5.33
1.29	5.41	1.29	5.41
1.30	5.50	1.30	5.50

Table C-6. Rating Tables Used to Estimate Discharge at TOSMO.

TOSMO Rating Table 02	
Water Level (ft)	Discharge (cfs)
0.10	0.14
0.11	0.18
0.12	0.22
0.13	0.26
0.14	0.31
0.15	0.37
0.16	0.43
0.17	0.50
0.18	0.55
0.19	0.61
0.20	0.67
0.21	0.73
0.22	0.79
0.23	0.85
0.24	0.92
0.25	0.99
0.26	1.06
0.27	1.14
0.28	1.21
0.29	1.29
0.30	1.37
0.31	1.45
0.32	1.57
0.33	1.69
0.34	1.81
0.35	1.94
0.36	2.08
0.37	2.22
0.38	2.37
0.39	2.52
0.40	2.68
0.41	2.84
0.42	3.01
0.43	3.19
0.44	3.37
0.45	3.55
0.46	3.75
0.47	3.95
0.48	4.15
0.49	4.36
0.50	4.58
0.51	4.80
0.52	5.03
0.53	5.27
0.54	5.51
0.55	5.76
0.56	6.02
0.57	6.28

Table C-6. Rating Tables Used to Estimate Discharge at TOSMO.

TOSMO Rating Table 02	
Water Level (ft)	Discharge (cfs)
0.58	6.55
0.59	6.82
0.60	7.10
0.61	7.39
0.62	7.69
0.63	7.99
0.64	8.30
0.65	8.61
0.66	8.93
0.67	9.26
0.68	9.60
0.69	9.90
0.70	10.20
0.71	10.50
0.72	10.82
0.73	11.13
0.74	11.45
0.75	11.78
0.76	12.11
0.77	12.44
0.78	12.78
0.79	13.13
0.80	13.47
0.81	13.83
0.82	14.19
0.83	14.55
0.84	14.92
0.85	15.29
0.86	15.67
0.87	16.05
0.88	16.44
0.89	16.83
0.90	17.23
0.91	17.63
0.92	18.03
0.93	18.45
0.94	18.86
0.95	19.28
0.96	19.71
0.97	20.14
0.98	20.58
0.99	21.02
1.00	21.46
1.01	21.91
1.02	22.37
1.03	22.83
1.04	23.29
1.05	23.76

Table C-6. Rating Tables Used to Estimate Discharge at TOSMO.

TOSMO Rating Table 02	
Water Level (ft)	Discharge (cfs)
1.06	24.23
1.07	24.71
1.08	25.20
1.09	25.69
1.10	26.18
1.11	26.68
1.12	27.18
1.13	27.69
1.14	28.21
1.15	28.73
1.16	29.25
1.17	29.78
1.18	30.31
1.19	30.85
1.20	31.39
1.21	31.94
1.22	32.49
1.23	33.05
1.24	33.61
1.25	34.18
1.26	34.76
1.27	35.33
1.28	35.92
1.29	36.50
1.30	37.10
1.31	37.69
1.32	38.30
1.33	38.90
1.34	39.52
1.35	40.13
1.36	40.76
1.37	41.39
1.38	42.02
1.39	42.66
1.40	43.30
1.41	43.95
1.42	44.60
1.43	45.26
1.44	45.92
1.45	46.59
1.46	47.26
1.47	47.94
1.48	48.62
1.49	49.31
1.50	50.00

Table C-7. Rating Table Used to Estimate Discharge at TOSMI.

TOSMI RatingTable 04	
Water Level (ft)	Discharge (cfs)
0.08	0.06
0.09	0.08
0.10	0.10
0.11	0.12
0.12	0.15
0.13	0.18
0.14	0.21
0.15	0.24
0.16	0.28
0.17	0.32
0.18	0.36
0.19	0.40
0.20	0.45
0.21	0.50
0.22	0.56
0.23	0.61
0.24	0.67
0.25	0.73
0.26	0.80
0.27	0.89
0.28	0.99
0.29	1.10
0.30	1.21
0.31	1.33
0.32	1.46
0.33	1.60
0.34	1.74
0.35	1.90
0.36	2.06
0.37	2.23
0.38	2.41
0.39	2.60
0.40	2.80
0.41	3.01
0.42	3.22
0.43	3.45
0.44	3.69
0.45	3.94
0.46	4.20
0.47	4.47
0.48	4.75
0.49	5.05
0.50	5.35
0.51	5.67
0.52	6.00
0.53	6.20
0.54	6.41
0.55	6.62

Table C-7. Rating Table Used to Estimate Discharge at TOSMI.

TOSMI RatingTable 04	
Water Level (ft)	Discharge (cfs)
0.56	6.83
0.57	7.05
0.58	7.27
0.59	7.49
0.60	7.71
0.61	7.94
0.62	8.17
0.63	8.40
0.64	8.64
0.65	8.88
0.66	9.12
0.67	9.36
0.68	9.61
0.69	9.86
0.70	10.11
0.71	10.37
0.72	10.63
0.73	10.89
0.74	11.15
0.75	11.42
0.76	11.69
0.77	11.96
0.78	12.23
0.79	12.51
0.80	12.79
0.81	13.07
0.82	13.35
0.83	13.64
0.84	13.93
0.85	14.22
0.86	14.52
0.87	14.82
0.88	15.12
0.89	15.42
0.90	15.73
0.91	16.03
0.92	16.34
0.93	16.66
0.94	16.97
0.95	17.29
0.96	17.61
0.97	17.94
0.98	18.26
0.99	18.59
1.00	18.92
1.01	19.26
1.02	19.59
1.03	19.93

Table C-7. Rating Table Used to Estimate Discharge at TOSMI.

TOSMI RatingTable 04	
Water Level (ft)	Discharge (cfs)
1.04	20.27
1.05	20.62
1.06	20.96
1.07	21.31
1.08	21.66
1.09	22.02
1.10	22.37
1.11	22.73
1.12	23.09
1.13	23.45
1.14	23.82
1.15	24.19
1.16	24.56
1.17	24.93
1.18	25.31
1.19	25.68
1.20	26.07
1.21	26.45
1.22	26.83
1.23	27.22
1.24	27.61
1.25	28.00
1.26	28.40
1.27	28.79
1.28	29.19
1.29	29.60
1.30	30.00

Table C-8. Rating Table Used to Estimate Discharge at COLM.

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.37	0.00
0.38	0.00
0.39	0.00
0.40	0.01
0.41	0.01
0.42	0.02
0.43	0.02
0.44	0.07
0.45	0.22
0.46	0.24
0.47	0.26
0.48	0.28
0.49	0.30
0.50	0.33
0.51	0.35
0.52	0.38
0.53	0.41
0.54	0.44
0.55	0.47
0.56	0.50
0.57	0.54
0.58	0.57
0.59	0.61
0.60	0.65
0.61	0.69
0.62	0.74
0.63	0.78
0.64	0.83
0.65	0.88
0.66	0.94
0.67	0.99
0.68	1.05
0.69	1.11
0.70	1.18
0.71	1.25
0.72	1.32
0.73	1.39
0.74	1.46
0.75	1.54
0.76	1.63
0.77	1.71
0.78	1.80
0.79	1.89
0.80	1.99
0.81	2.09
0.82	2.19
0.83	2.29
0.84	2.40

Table C-8. Rating Table Used to Estimate Discharge at COLM.

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.85	2.52
0.86	2.64
0.87	2.76
0.88	2.88
0.89	3.02
0.90	3.15
0.91	3.31
0.92	3.47
0.93	3.64
0.94	3.81
0.95	3.99
0.96	4.18
0.97	4.37
0.98	4.58
0.99	4.78
1.00	5.00
1.01	5.17
1.02	5.35
1.03	5.53
1.04	5.72
1.05	5.91
1.06	6.10
1.07	6.30
1.08	6.50
1.09	6.71
1.10	6.93
1.11	7.14
1.12	7.37
1.13	7.59
1.14	7.83
1.15	8.06
1.16	8.31
1.17	8.55
1.18	8.81
1.19	9.06
1.20	9.33
1.21	9.59
1.22	9.87
1.23	10.15
1.24	10.43
1.25	10.72
1.26	11.02
1.27	11.32
1.28	11.63
1.29	11.94
1.30	12.26
1.31	12.59
1.32	12.92

Table C-8. Rating Table Used to Estimate Discharge at COLM.

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.33	13.26
1.34	13.60
1.35	13.95
1.36	14.31
1.37	14.67
1.38	15.04
1.39	15.41
1.40	15.80
1.41	16.19
1.42	16.58
1.43	16.99
1.44	17.39
1.45	17.81
1.46	18.23
1.47	18.67
1.48	19.10
1.49	19.55
1.50	20.00
1.51	20.46
1.52	20.92
1.53	21.39
1.54	21.86
1.55	22.35
1.56	22.84
1.57	23.34
1.58	23.85
1.59	24.36
1.60	24.89
1.61	25.42
1.62	25.96
1.63	26.50
1.64	27.06
1.65	27.62
1.66	28.19
1.67	28.77
1.68	29.36
1.69	29.96
1.70	30.56
1.71	31.17
1.72	31.80
1.73	32.43
1.74	33.07
1.75	33.71
1.76	34.37
1.77	35.04
1.78	35.71
1.79	36.40

Table C-8. Rating Table Used to Estimate Discharge at COLM.

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.80	37.09
1.81	37.79
1.82	38.51
1.83	39.23
1.84	39.96
1.85	40.70
1.86	41.45
1.87	42.21
1.88	42.98
1.89	43.76
1.90	44.55
1.91	45.35
1.92	46.15
1.93	46.97
1.94	47.80
1.95	48.64
1.96	49.49
1.97	50.35
1.98	51.23
1.99	52.11
2.00	53.00

Table C-9. Rating Table Used to Estimate Discharge at SEIMN.

SEIMN Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.10	0.01
0.11	0.02
0.12	0.02
0.13	0.03
0.14	0.04
0.15	0.06
0.16	0.08
0.17	0.10
0.18	0.13
0.19	0.16
0.20	0.20
0.21	0.24
0.22	0.29
0.23	0.35
0.24	0.42
0.25	0.49
0.26	0.53
0.27	0.58
0.28	0.63
0.29	0.68
0.30	0.73
0.31	0.79
0.32	0.85
0.33	0.91
0.34	0.97
0.35	1.03
0.36	1.10
0.37	1.17
0.38	1.24
0.39	1.31
0.40	1.39
0.41	1.46
0.42	1.54
0.43	1.63
0.44	1.71
0.45	1.80
0.46	1.89
0.47	1.98
0.48	2.07
0.49	2.17
0.50	2.27
0.51	2.37
0.52	2.47
0.53	2.58
0.54	2.69
0.55	2.80
0.56	2.91
0.57	3.03

Table C-9. Rating Table Used to Estimate Discharge at SEIMN.

SEIMN Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.58	3.15
0.59	3.27
0.60	3.39
0.61	3.52
0.62	3.65
0.63	3.78
0.64	3.91
0.65	4.05
0.66	4.19
0.67	4.33
0.68	4.48
0.69	4.62
0.70	4.77
0.71	4.92
0.72	5.08
0.73	5.24
0.74	5.40
0.75	5.56
0.76	5.72
0.77	5.89
0.78	6.06
0.79	6.24
0.80	6.41
0.81	6.59
0.82	6.77
0.83	6.95
0.84	7.14
0.85	7.33
0.86	7.52
0.87	7.72
0.88	7.92
0.89	8.12
0.90	8.32
0.91	8.52
0.92	8.73
0.93	8.94
0.94	9.16
0.95	9.37
0.96	9.59
0.97	9.82
0.98	10.04
0.99	10.27
1.00	10.50
1.01	10.74
1.02	10.98
1.03	11.22
1.04	11.46
1.05	11.71

Table C-9. Rating Table Used to Estimate Discharge at SEIMN.

SEIMN Rating Table 07	
Water Level (ft)	Discharge (cfs)
1.06	11.96
1.07	12.22
1.08	12.48
1.09	12.74
1.10	13.00

Table C-10. Rating Table Used to Estimate Discharge at SEIMS.

SEIMS Rating Table 03	
Water Level (ft)	Discharge (cfs)
0.06	0.08
0.07	0.10
0.08	0.13
0.09	0.16
0.10	0.19
0.11	0.22
0.12	0.25
0.13	0.29
0.14	0.33
0.15	0.37
0.16	0.41
0.17	0.45
0.18	0.50
0.19	0.55
0.20	0.61
0.21	0.67
0.22	0.73
0.23	0.80
0.24	0.87
0.25	0.94
0.26	1.01
0.27	1.09
0.28	1.17
0.29	1.25
0.30	1.33
0.31	1.42
0.32	1.51
0.33	1.60
0.34	1.71
0.35	1.81
0.36	1.93
0.37	2.04
0.38	2.16
0.39	2.29
0.40	2.42
0.41	2.55
0.42	2.68
0.43	2.82
0.44	2.96
0.45	3.11
0.46	3.26
0.47	3.41
0.48	3.57
0.49	3.73
0.50	3.89
0.51	4.06
0.52	4.23
0.53	4.41

Table C-10. Rating Table Used to Estimate Discharge at SEIMS.

SEIMS Rating Table 03	
Water Level (ft)	Discharge (cfs)
0.54	4.59
0.55	4.77
0.56	4.96
0.57	5.15
0.58	5.35
0.59	5.55
0.60	5.75
0.61	5.96
0.62	6.17
0.63	6.38
0.64	6.60
0.65	6.83
0.66	7.05
0.67	7.28
0.68	7.52
0.69	7.76
0.70	8.00
0.71	8.24
0.72	8.49
0.73	8.74
0.74	9.00
0.75	9.26
0.76	9.52
0.77	9.79
0.78	10.06
0.79	10.33
0.80	10.61
0.81	10.89
0.82	11.18
0.83	11.47
0.84	11.76
0.85	12.06
0.86	12.36
0.87	12.67
0.88	12.98
0.89	13.29
0.90	13.61
0.91	13.93
0.92	14.25
0.93	14.58
0.94	14.92
0.95	15.25
0.96	15.59
0.97	15.94
0.98	16.29
0.99	16.64
1.00	17.00

Table C-11. Rating Tables Used to Estimate Discharge at COUMO.

COUMO Rating Table 05		COUMO Rating Table 06	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.18	0.06	0.16	0.03
0.19	0.08	0.17	0.04
0.20	0.09	0.18	0.05
0.21	0.12	0.19	0.06
0.22	0.14	0.20	0.07
0.23	0.17	0.21	0.09
0.24	0.20	0.22	0.11
0.25	0.24	0.23	0.13
0.26	0.29	0.24	0.15
0.27	0.33	0.25	0.18
0.28	0.39	0.26	0.20
0.29	0.45	0.27	0.24
0.30	0.52	0.28	0.27
0.31	0.60	0.29	0.31
0.32	0.69	0.30	0.36
0.33	0.78	0.31	0.41
0.34	0.89	0.32	0.46
0.35	0.97	0.33	0.52
0.36	1.05	0.34	0.59
0.37	1.14	0.35	0.66
0.38	1.24	0.36	0.74
0.39	1.34	0.37	0.81
0.40	1.44	0.38	0.88
0.41	1.55	0.39	0.95
0.42	1.66	0.40	1.03
0.43	1.78	0.41	1.11
0.44	1.91	0.42	1.20
0.45	2.04	0.43	1.29
0.46	2.18	0.44	1.39
0.47	2.32	0.45	1.49
0.48	2.47	0.46	1.60
0.49	2.63	0.47	1.71
0.50	2.79	0.48	1.82
0.51	2.96	0.49	1.94
0.52	3.13	0.50	2.07
0.53	3.31	0.51	2.20
0.54	3.50	0.52	2.34
0.55	3.70	0.53	2.49
0.56	3.90	0.54	2.64
0.57	4.11	0.55	2.79
0.58	4.33	0.56	2.95
0.59	4.55	0.57	3.12
0.60	4.78	0.58	3.30
0.61	5.02	0.59	3.48
0.62	5.27	0.60	3.67
0.63	5.53	0.61	3.86
0.64	5.79	0.62	4.06
0.65	6.06	0.63	4.27

Table C-11. Rating Tables Used to Estimate Discharge at COUMO.

COUMO Rating Table 05		COUMO Rating Table 06	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.66	6.34	0.64	4.49
0.67	6.63	0.65	4.71
0.68	6.93	0.66	4.94
0.69	7.23	0.67	5.18
0.70	7.55	0.68	5.43
0.71	7.87	0.69	5.68
0.72	8.21	0.70	5.94
0.73	8.55	0.71	6.21
0.74	8.90	0.72	6.49
0.75	9.18	0.73	6.78
0.76	9.46	0.74	7.08
0.77	9.74	0.75	7.38
0.78	10.03	0.76	7.69
0.79	10.33	0.77	8.01
0.80	10.63	0.78	8.34
0.81	10.93	0.79	8.68
0.82	11.24	0.80	9.03
0.83	11.56	0.81	9.39
0.84	11.88	0.82	9.76
0.85	12.20	0.83	10.14
0.86	12.53	0.84	10.52
0.87	12.87	0.85	10.92
0.88	13.21	0.86	11.33
0.89	13.55	0.87	11.75
0.90	13.90	0.88	12.18
0.91	14.25	0.89	12.62
0.92	14.61	0.90	13.06
0.93	14.98	0.91	13.52
0.94	15.35	0.92	14.00
0.95	15.72	0.93	14.48
0.96	16.10	0.94	14.97
0.97	16.49	0.95	15.48
0.98	16.87	0.96	15.99
0.99	17.27	0.97	16.52
1.00	17.67	0.98	17.06
1.01	18.07	0.99	17.61
1.02	18.48	1.00	18.17
1.03	18.90	1.01	18.75
1.04	19.32	1.02	19.34
1.05	19.75	1.03	19.94
1.06	20.18	1.04	20.55
1.07	20.61	1.05	21.18
1.08	21.05	1.06	21.82
1.09	21.50	1.07	22.47
1.10	21.95	1.08	23.13
1.11	22.41	1.09	23.81
1.12	22.87	1.10	24.50
1.13	23.34		

Table C-11. Rating Tables Used to Estimate Discharge at COUMO.

COUMO Rating Table 05		COUMO Rating Table 06	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
1.14	23.81		
1.15	24.29		
1.16	24.78		
1.17	25.27		
1.18	25.76		
1.19	26.26		
1.20	26.76		
1.21	27.28		
1.22	27.79		
1.23	28.31		
1.24	28.84		
1.25	29.37		
1.26	29.91		
1.27	30.45		
1.28	31.00		
1.29	31.56		
1.30	32.12		
1.31	32.68		
1.32	33.25		
1.33	33.83		
1.34	34.41		
1.35	35.00		

Table C-12. Rating Tables Used to Estimate Discharge at COUMI.

COUMI Rating Table 07		COUMI Rating Table 08	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.12	0.01	0.12	0.01
0.13	0.01	0.13	0.01
0.14	0.02	0.14	0.02
0.15	0.03	0.15	0.03
0.16	0.04	0.16	0.04
0.17	0.04	0.17	0.04
0.18	0.05	0.18	0.05
0.19	0.06	0.19	0.06
0.20	0.08	0.20	0.08
0.21	0.09	0.21	0.09
0.22	0.10	0.22	0.10
0.23	0.12	0.23	0.12
0.24	0.13	0.24	0.13
0.25	0.15	0.25	0.15
0.26	0.17	0.26	0.17
0.27	0.20	0.27	0.20
0.28	0.22	0.28	0.22
0.29	0.25	0.29	0.25
0.30	0.27	0.30	0.27
0.31	0.30	0.31	0.30
0.32	0.34	0.32	0.34
0.33	0.37	0.33	0.37
0.34	0.41	0.34	0.41
0.35	0.45	0.35	0.45
0.36	0.49	0.36	0.49
0.37	0.54	0.37	0.54
0.38	0.58	0.38	0.58
0.39	0.63	0.39	0.63
0.40	0.69	0.40	0.69
0.41	0.74	0.41	0.74
0.42	0.80	0.42	0.80
0.43	0.87	0.43	0.87
0.44	0.93	0.44	0.93
0.45	1.00	0.45	1.00
0.46	1.07	0.46	1.07
0.47	1.15	0.47	1.15
0.48	1.26	0.48	1.26
0.49	1.37	0.49	1.37
0.50	1.49	0.50	1.49
0.51	1.61	0.51	1.61
0.52	1.75	0.52	1.75
0.53	1.89	0.53	1.89
0.54	2.05	0.54	2.05
0.55	2.21	0.55	2.21
0.56	2.38	0.56	2.38
0.57	2.56	0.57	2.56
0.58	2.75	0.58	2.75
0.59	2.96	0.59	2.96

Table C-12. Rating Tables Used to Estimate Discharge at COUMI.

COUMI Rating Table 07		COUMI Rating Table 08	
Water Level (ft)	Discharge (cfs)	Water Level (ft)	Discharge (cfs)
0.60	3.17	0.60	3.17
0.61	3.39	0.61	3.39
0.62	3.63	0.62	3.63
0.63	3.88	0.63	3.88
0.64	4.14	0.64	4.14
0.65	4.42	0.65	4.42
0.66	4.71	0.66	4.71
0.67	5.01	0.67	5.01
0.68	5.33	0.68	5.33
0.69	5.66	0.69	5.66
0.70	6.01	0.70	6.01
0.71	6.37	0.71	6.37
0.72	6.75	0.72	6.75
0.73	7.15	0.73	7.15
0.74	7.57	0.74	7.57
0.75	8.00	0.75	8.00

Table C-13. Rating Table Used to Estimate Discharge at TYLMO.

TYLMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.01	0.01
0.02	0.02
0.03	0.04
0.04	0.05
0.05	0.08
0.06	0.11
0.07	0.14
0.08	0.18
0.09	0.23
0.10	0.28
0.11	0.33
0.12	0.39
0.13	0.46
0.14	0.53
0.15	0.60
0.16	0.69
0.17	0.78
0.18	0.88
0.19	0.99
0.20	1.11
0.21	1.23
0.22	1.35
0.23	1.49
0.24	1.63
0.25	1.78
0.26	1.93
0.27	2.09
0.28	2.26
0.29	2.44
0.30	2.62
0.31	2.81
0.32	3.01
0.33	3.21
0.34	3.42
0.35	3.64
0.36	3.86
0.37	4.09
0.38	4.33
0.39	4.58
0.40	4.83
0.41	5.09
0.42	5.36
0.43	5.64
0.44	5.92
0.45	6.21
0.46	6.51
0.47	6.81
0.48	7.12

Table C-13. Rating Table Used to Estimate Discharge at TYLMO.

TYLMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.49	7.44
0.50	7.77
0.51	8.10
0.52	8.44
0.53	8.79
0.54	9.15
0.55	9.51
0.56	9.88
0.57	10.26
0.58	10.65
0.59	11.04
0.60	11.45
0.61	11.86
0.62	12.27
0.63	12.70
0.64	13.13
0.65	13.57
0.66	14.02
0.67	14.47
0.68	14.94
0.69	15.41
0.70	15.89
0.71	16.37
0.72	16.87
0.73	17.37
0.74	17.88
0.75	18.40
0.76	18.93
0.77	19.46
0.78	20.00

Table C-14. Rating Table Used to Estimate Discharge at TYLMI.

TLYMI Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.07	0.01
0.08	0.02
0.09	0.02
0.10	0.03
0.11	0.04
0.12	0.06
0.13	0.07
0.14	0.10
0.15	0.12
0.16	0.15
0.17	0.19
0.18	0.23
0.19	0.28
0.20	0.33
0.21	0.40
0.22	0.47
0.23	0.54
0.24	0.63
0.25	0.68
0.26	0.74
0.27	0.80
0.28	0.86
0.29	0.92
0.30	0.99
0.31	1.05
0.32	1.12
0.33	1.19
0.34	1.27
0.35	1.34
0.36	1.42
0.37	1.50
0.38	1.58
0.39	1.67
0.40	1.76
0.41	1.85
0.42	1.94
0.43	2.03
0.44	2.13
0.45	2.22
0.46	2.33
0.47	2.43
0.48	2.53
0.49	2.64
0.50	2.75
0.51	2.86
0.52	2.97
0.53	3.09
0.54	3.21

Table C-14. Rating Table Used to Estimate Discharge at TYLMI.

TLYMI Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.55	3.33
0.56	3.45
0.57	3.58
0.58	3.70
0.59	3.83
0.60	3.96
0.61	4.10
0.62	4.23
0.63	4.37
0.64	4.51
0.65	4.65
0.66	4.80
0.67	4.95
0.68	5.09
0.69	5.25
0.70	5.40
0.71	5.56
0.72	5.73
0.73	5.90
0.74	6.08
0.75	6.25
0.76	6.43
0.77	6.61
0.78	6.79
0.79	6.98
0.80	7.17
0.81	7.36
0.82	7.55
0.83	7.75
0.84	7.95
0.85	8.15
0.86	8.35
0.87	8.56
0.88	8.77
0.89	8.98
0.90	9.20

APPENDIX D

Summary Statistics for Individual Storm Events by Monitoring Station

Table D-1. Summary Statistics for Individual Storm Events at the EVALSS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
10/1/2018 7:50	10/1/2018 20:40	12.8	0.47	0.04	0.24	33.6	10/1/2018 7:50	10/2/2018 8:35	24.8	1.51	2.27	134,577
10/2/2018 17:35	10/2/2018 18:30	0.9	0.06	0.07	0.12	21.8	10/2/2018 17:35	10/3/2018 6:30	13.0	1.22	1.22	56,928
10/5/2018 8:50	10/5/2018 19:45	10.9	0.57	0.05	0.24	63.1	10/5/2018 8:50	10/6/2018 7:40	22.9	2.04	2.92	168,690
10/8/2018 1:40	10/8/2018 5:25	3.8	0.03	0.01	0.12	55.8	10/8/2018 1:40	10/8/2018 10:15	8.7	1.38	1.38	43,056
10/8/2018 10:20	10/9/2018 7:30	21.2	0.91	0.04	0.36	64.4	10/8/2018 10:15	10/9/2018 19:25	33.3	2.52	3.65	301,116
10/23/2018 18:00	10/23/2018 19:00	1.0	0.04	0.04	0.12	346.8	10/23/2018 17:55	10/24/2018 6:55	13.1	1.52	1.54	71,382
10/25/2018 6:55	10/26/2018 9:00	26.1	0.89	0.03	0.24	36.9	10/25/2018 6:55	10/26/2018 20:55	38.1	2.48	4.73	340,314
10/27/2018 15:25	10/28/2018 6:30	15.1	1.37	0.09	0.96	30.7	10/27/2018 15:20	10/28/2018 16:50	25.6	4.45	6.63	410,281
10/28/2018 16:50	10/28/2018 21:45	4.9	0.13	0.03	0.12	10.6	10/28/2018 16:50	10/29/2018 8:10	15.4	2.71	3.16	150,405
10/29/2018 8:10	10/29/2018 14:20	6.2	0.07	0.01	0.24	13.5	10/29/2018 8:10	10/30/2018 2:15	18.2	2.20	2.27	143,670
10/30/2018 20:05	10/31/2018 2:10	6.1	0.19	0.03	0.24	30.0	10/30/2018 20:00	10/31/2018 14:10	18.3	2.21	2.48	144,891
10/31/2018 15:35	10/31/2018 20:15	4.7	0.06	0.01	0.12	17.2	10/31/2018 15:30	10/31/2018 23:45	8.3	2.08	2.27	62,514
10/31/2018 23:45	11/1/2018 10:30	10.8	0.24	0.02	0.12	7.5	10/31/2018 23:45	11/1/2018 22:30	22.8	2.36	2.92	193,978
11/1/2018 23:30	11/2/2018 17:30	18.0	0.68	0.04	0.60	14.0	11/1/2018 23:25	11/3/2018 5:25	30.1	3.16	5.33	342,477
11/3/2018 9:55	11/3/2018 19:50	9.9	0.25	0.03	0.12	20.9	11/3/2018 9:55	11/4/2018 4:40	18.8	2.60	2.92	175,965
11/4/2018 4:40	11/4/2018 6:10	1.5	0.08	0.05	0.24	10.6	11/4/2018 4:40	11/4/2018 15:45	11.2	2.40	2.48	96,672
11/4/2018 15:50	11/4/2018 21:15	5.4	0.24	0.04	0.72	10.9	11/4/2018 15:45	11/5/2018 9:10	17.5	2.57	3.16	161,697
11/5/2018 14:45	11/5/2018 18:10	3.4	0.08	0.02	0.24	22.2	11/5/2018 14:45	11/6/2018 6:10	15.5	2.18	2.27	121,422
11/9/2018 9:40	11/9/2018 11:55	2.3	0.09	0.04	0.12	90.8	11/9/2018 9:40	11/9/2018 23:55	14.3	1.73	1.89	89,442
11/14/2018 5:25	11/14/2018 9:20	3.9	0.10	0.03	0.24	114.3	11/14/2018 5:25	11/14/2018 21:20	16.0	1.82	1.89	104,652
11/15/2018 20:45	11/16/2018 7:35	10.8	0.15	0.01	0.12	36.8	11/15/2018 20:45	11/16/2018 19:30	22.8	1.93	2.08	158,358
11/21/2018 21:45	11/23/2018 19:50	46.1	1.34	0.03	0.84	137.8	11/21/2018 21:40	11/24/2018 7:50	58.3	2.90	4.17	608,102
11/26/2018 4:15	11/27/2018 6:35	26.3	1.35	0.05	0.24	60.8	11/26/2018 4:15	11/27/2018 15:10	35.0	3.92	6.29	494,044
11/27/2018 15:10	11/27/2018 20:20	5.2	0.31	0.06	0.96	8.9	11/27/2018 15:10	11/28/2018 4:05	13.0	3.63	4.17	169,788
11/28/2018 4:10	11/28/2018 11:25	7.3	0.22	0.03	0.48	9.8	11/28/2018 4:05	11/28/2018 14:15	10.3	3.47	3.91	128,100
11/28/2018 14:20	11/28/2018 17:55	3.6	0.07	0.02	0.12	7.9	11/28/2018 14:15	11/29/2018 5:55	15.8	2.83	3.16	160,248
11/30/2018 19:20	11/30/2018 21:45	2.4	0.19	0.08	0.24	51.8	11/30/2018 19:15	12/1/2018 9:40	14.5	2.35	2.70	122,532
12/1/2018 10:35	12/1/2018 11:25	0.8	0.03	0.04	0.12	13.2	12/1/2018 10:30	12/1/2018 23:25	13.0	2.08	2.08	97,344
12/9/2018 9:35	12/9/2018 21:05	11.5	0.69	0.06	0.24	204.2	12/9/2018 9:30	12/10/2018 9:00	23.6	2.53	3.16	214,584
12/10/2018 11:05	12/10/2018 11:15	0.2	0.04	0.24	0.24	14.7	12/10/2018 11:00	12/10/2018 23:10	12.3	2.06	2.27	91,044
12/11/2018 3:25	12/12/2018 0:35	21.2	0.66	0.03	0.60	16.3	12/11/2018 3:20	12/12/2018 12:30	33.3	2.94	4.45	351,333
12/12/2018 21:35	12/13/2018 3:35	6.0	0.04	0.01	0.12	24.3	12/12/2018 21:30	12/13/2018 7:05	9.7	2.27	2.27	78,882
12/13/2018 7:05	12/13/2018 17:00	9.9	0.10	0.01	0.12	9.5	12/13/2018 7:05	12/14/2018 5:00	22.0	2.20	2.27	174,027
12/15/2018 22:55	12/16/2018 5:35	6.7	0.27	0.04	0.12	57.2	12/15/2018 22:50	12/16/2018 14:45	16.0	2.17	2.48	124,764
12/16/2018 14:45	12/16/2018 21:50	7.1	0.18	0.03	0.12	10.4	12/16/2018 14:45	12/17/2018 9:45	19.1	2.16	2.48	148,203
12/17/2018 17:15	12/18/2018 8:10	14.9	0.57	0.04	0.24	19.9	12/17/2018 17:10	12/18/2018 13:40	20.6	2.95	3.91	218,472
12/18/2018 13:45	12/18/2018 18:30	4.8	0.27	0.06	0.36	7.4	12/18/2018 13:40	12/19/2018 6:30	16.9	3.16	3.91	192,339
12/20/2018 1:55	12/20/2018 16:35	14.7	0.21	0.01	0.24	31.7	12/20/2018 1:50	12/21/2018 4:30	26.8	2.36	2.70	227,698
12/22/2018 18:00	12/23/2018 13:10	19.2	0.74	0.04	0.36	55.1	12/22/2018 17:55	12/24/2018 1:05	31.3	3.08	4.73	346,223
12/26/2018 9:40	12/26/2018 11:45	2.1	0.05	0.02	0.12	72.7	12/26/2018 9:40	12/26/2018 23:45	14.2	2.08	2.27	106,080
12/27/2018 2:55	12/27/2018 8:45	5.8	0.04	0.01	0.12	16.2	12/27/2018 2:55	12/27/2018 20:45	17.9	1.99	2.08	128,061
12/28/2018 7:25	12/28/2018 21:35	14.2	0.80	0.06	0.24	28.5	12/28/2018 7:25	12/29/2018 9:30	26.2	3.74	5.33	351,939
12/29/2018 12:45	12/30/2018 2:40	13.9	0.80	0.06	0.60	16.1	12/29/2018 12:40	12/30/2018 14:35	26.0	4.61	5.96	431,224
1/2/2019 23:55	1/4/2019 3:25	27.5	0.91	0.03	0.36	93.3	1/2/2019 23:55	1/4/2019 6:30	30.7	3.67	5.03	404,713
1/4/2019 6:35	1/4/2019 12:45	6.2	0.04	0.01	0.12	6.6	1/4/2019 6:30	1/4/2019 13:15	6.8	3.48	3.65	85,590
1/4/2019 13:15	1/4/2019 18:15	5.0	0.08	0.02	0.12	13.4	1/4/2019 13:15	1/5/2019 6:10	17.0	2.94	3.40	180,145

Table D-1. Summary Statistics for Individual Storm Events at the EVALSS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
1/5/2019 22:40	1/6/2019 3:00	4.3	0.11	0.03	0.12	31.0	1/5/2019 22:40	1/6/2019 14:55	16.3	2.38	2.70	139,905
1/6/2019 17:10	1/7/2019 0:20	7.2	0.51	0.07	0.24	15.3	1/6/2019 17:10	1/7/2019 12:20	19.3	3.42	4.73	237,132
1/8/2019 8:50	1/8/2019 20:15	11.4	0.17	0.01	0.12	32.9	1/8/2019 8:50	1/9/2019 1:40	16.9	2.42	2.48	147,441
1/9/2019 1:45	1/10/2019 13:50	36.1	0.38	0.01	0.24	8.2	1/9/2019 1:40	1/11/2019 1:50	48.3	2.48	2.70	430,928
1/17/2019 2:10	1/17/2019 3:40	1.5	0.11	0.07	0.12	160.4	1/17/2019 2:10	1/17/2019 15:40	13.6	1.90	2.08	93,069
1/18/2019 4:20	1/18/2019 5:25	1.1	0.04	0.04	0.12	25.3	1/18/2019 4:15	1/18/2019 17:25	13.3	1.77	1.89	84,375
1/18/2019 18:45	1/19/2019 1:55	7.2	0.19	0.03	0.24	14.4	1/18/2019 18:40	1/19/2019 13:30	18.9	2.00	2.27	135,958
1/19/2019 13:35	1/19/2019 16:40	3.1	0.04	0.01	0.12	15.8	1/19/2019 13:30	1/20/2019 4:40	15.3	1.85	1.89	101,385
1/22/2019 13:55	1/23/2019 9:55	20.0	1.00	0.05	0.24	72.3	1/22/2019 13:50	1/23/2019 21:55	32.2	3.23	4.17	374,493
2/1/2019 4:40	2/1/2019 21:15	16.6	0.69	0.04	0.24	212.5	2/1/2019 4:40	2/2/2019 9:10	28.6	2.77	3.40	285,128
2/5/2019 10:50	2/5/2019 13:55	3.1	0.54	0.18	0.36	87.2	2/5/2019 10:50	2/6/2019 1:50	15.1	2.04	2.08	110,721
2/9/2019 14:15	2/9/2019 16:25	2.2	0.04	0.02	0.12	96.5	2/9/2019 14:10	2/10/2019 4:25	14.3	1.74	1.89	89,856
2/11/2019 11:25	2/11/2019 15:50	4.4	0.11	0.02	0.24	45.2	2/11/2019 11:25	2/12/2019 3:50	16.5	2.00	2.08	118,839
2/12/2019 11:20	2/13/2019 13:35	26.3	0.96	0.04	0.12	22.1	2/12/2019 11:15	2/14/2019 1:30	38.3	2.88	3.40	396,823
2/14/2019 14:20	2/14/2019 20:40	6.3	0.25	0.04	0.12	25.0	2/14/2019 14:20	2/15/2019 8:35	18.3	3.54	4.17	233,593
2/16/2019 7:50	2/16/2019 22:30	14.7	0.37	0.03	0.12	36.1	2/16/2019 7:50	2/17/2019 10:25	26.7	4.17	5.96	399,931
2/19/2019 13:35	2/20/2019 3:00	13.4	0.39	0.03	0.24	64.7	2/19/2019 13:30	2/20/2019 14:55	25.5	5.12	6.29	470,097
2/22/2019 8:30	2/22/2019 16:20	7.8	0.25	0.03	0.24	55.5	2/22/2019 8:25	2/23/2019 4:15	19.9	4.05	5.03	290,310
2/23/2019 12:55	2/23/2019 20:45	7.8	0.19	0.02	0.24	22.2	2/23/2019 12:55	2/24/2019 8:45	19.9	4.36	5.03	312,561
3/6/2019 13:45	3/6/2019 19:45	6.0	0.11	0.02	0.12	257.4	3/6/2019 13:40	3/7/2019 7:40	18.1	1.89	2.08	123,000
3/7/2019 9:40	3/7/2019 16:20	6.7	0.18	0.03	0.24	16.1	3/7/2019 9:40	3/8/2019 4:15	18.7	2.11	2.27	142,056
3/8/2019 9:00	3/8/2019 9:50	0.8	0.06	0.07	0.12	22.3	3/8/2019 8:55	3/8/2019 21:45	12.9	1.99	2.08	92,331
3/11/2019 17:55	3/12/2019 20:30	26.6	1.35	0.05	0.36	80.4	3/11/2019 17:55	3/13/2019 4:25	34.6	3.71	6.63	462,355
3/13/2019 4:30	3/13/2019 5:35	1.1	0.07	0.06	0.24	8.2	3/13/2019 4:25	3/13/2019 17:35	13.3	2.45	2.70	116,919
3/25/2019 17:15	3/26/2019 5:15	12.0	0.26	0.02	0.24	300.4	3/25/2019 17:10	3/26/2019 17:10	24.1	1.54	1.89	133,116
4/3/2019 1:20	4/3/2019 10:30	9.2	0.11	0.01	0.12	191.8	4/3/2019 1:20	4/3/2019 22:25	21.2	1.26	1.38	96,276
4/4/2019 23:35	4/5/2019 6:15	6.7	0.17	0.03	0.12	42.2	4/4/2019 23:35	4/5/2019 11:35	12.1	1.38	1.54	59,934
4/5/2019 11:35	4/5/2019 17:45	6.2	0.29	0.05	0.60	7.8	4/5/2019 11:35	4/6/2019 5:45	18.3	1.75	2.27	115,047
4/6/2019 6:45	4/6/2019 14:55	8.2	0.13	0.02	0.48	15.4	4/6/2019 6:40	4/6/2019 21:40	15.1	1.52	1.71	82,620
4/6/2019 21:40	4/7/2019 4:50	7.2	0.42	0.06	0.12	8.8	4/6/2019 21:40	4/7/2019 16:50	19.3	2.21	2.92	152,853
4/8/2019 17:25	4/9/2019 12:20	18.9	0.55	0.03	0.60	37.8	4/8/2019 17:25	4/10/2019 0:20	31.0	2.24	3.40	249,733
4/10/2019 10:25	4/11/2019 14:20	27.9	0.49	0.02	0.24	23.2	4/10/2019 10:25	4/11/2019 21:10	34.8	2.36	2.70	296,052
4/11/2019 21:15	4/12/2019 6:35	9.3	0.57	0.06	0.96	8.4	4/11/2019 21:10	4/12/2019 18:30	21.4	3.35	5.03	258,540
4/13/2019 5:50	4/13/2019 15:45	9.9	0.29	0.03	0.12	26.0	4/13/2019 5:45	4/14/2019 3:40	22.0	2.57	3.16	203,509
4/14/2019 17:45	4/14/2019 21:40	3.9	0.06	0.02	0.12	30.3	4/14/2019 17:45	4/15/2019 9:40	16.0	2.07	2.08	119,238
4/16/2019 17:00	4/16/2019 19:40	2.7	0.11	0.04	0.12	45.7	4/16/2019 17:00	4/17/2019 7:40	14.8	1.92	2.08	102,123
4/18/2019 4:55	4/18/2019 7:15	2.3	0.12	0.05	0.24	34.2	4/18/2019 4:50	4/18/2019 17:55	13.2	1.89	2.08	89,367
4/18/2019 18:00	4/18/2019 22:45	4.8	0.11	0.02	0.12	11.2	4/18/2019 17:55	4/19/2019 4:15	10.4	1.93	2.08	72,294
4/19/2019 4:15	4/19/2019 22:50	18.6	0.29	0.02	0.24	8.6	4/19/2019 4:15	4/20/2019 10:50	30.7	2.15	2.27	237,726
4/22/2019 11:05	4/22/2019 18:20	7.3	0.32	0.04	0.24	66.2	4/22/2019 11:00	4/23/2019 6:20	19.4	2.05	2.48	143,415
4/27/2019 14:20	4/27/2019 14:50	0.5	0.15	0.30	0.48	117.2	4/27/2019 14:20	4/28/2019 2:45	12.5	1.59	1.89	71,769
5/14/2019 8:30	5/14/2019 14:50	6.3	0.21	0.03	1.08	401.9	5/14/2019 8:30	5/15/2019 2:45	18.3	1.66	2.27	109,518
5/15/2019 16:25	5/15/2019 19:25	3.0	0.07	0.02	0.12	25.7	5/15/2019 16:25	5/16/2019 7:25	15.1	1.52	1.54	82,710
5/16/2019 10:40	5/17/2019 6:45	20.1	0.85	0.04	0.24	17.4	5/16/2019 10:40	5/17/2019 18:40	32.1	2.49	4.17	287,793
5/20/2019 9:05	5/20/2019 22:35	13.5	0.30	0.02	0.12	76.6	5/20/2019 9:00	5/21/2019 10:30	25.6	1.72	2.08	158,343
5/24/2019 9:35	5/24/2019 10:55	1.3	0.04	0.03	0.12	84.2	5/24/2019 9:30	5/24/2019 22:50	13.4	1.38	1.38	66,654
5/25/2019 11:50	5/25/2019 16:30	4.7	0.17	0.04	0.12	26.2	5/25/2019 11:45	5/26/2019 4:25	16.8	1.59	1.89	95,961

Table D-1. Summary Statistics for Individual Storm Events at the EVALSS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
6/6/2019 15:35	6/6/2019 19:00	3.4	0.09	0.03	0.24	288.1	6/6/2019 15:30	6/7/2019 5:15	13.8	1.19	1.22	59,370
6/7/2019 5:20	6/7/2019 9:35	4.3	0.08	0.02	0.48	11.2	6/7/2019 5:15	6/7/2019 21:30	16.3	1.28	1.38	75,432
6/18/2019 5:50	6/18/2019 7:10	1.3	0.03	0.02	0.12	264.4	6/18/2019 5:45	6/18/2019 19:05	13.4	1.08	1.22	52,206
6/19/2019 15:50	6/20/2019 3:00	11.2	0.60	0.05	0.36	298.4	6/19/2019 15:50	6/20/2019 14:55	23.2	1.68	2.70	140,271
6/23/2019 6:30	6/23/2019 9:10	2.7	0.04	0.02	0.12	76.7	6/23/2019 6:30	6/23/2019 21:10	14.8	1.22	1.22	64,782
6/23/2019 23:20	6/24/2019 2:05	2.8	0.03	0.01	0.12	16.8	6/23/2019 23:20	6/24/2019 14:00	14.8	1.22	1.22	64,782
6/26/2019 14:40	6/26/2019 14:55	0.3	0.04	0.16	0.12	80.2	6/26/2019 14:35	6/27/2019 1:50	11.3	1.09	1.22	44,445
6/27/2019 1:50	6/27/2019 6:25	4.6	0.08	0.02	0.24	11.2	6/27/2019 1:50	6/27/2019 18:20	16.6	1.17	1.22	69,936
7/2/2019 10:35	7/2/2019 13:25	2.8	0.27	0.10	0.36	128.4	7/2/2019 10:30	7/2/2019 20:35	10.2	1.43	1.71	52,419
7/2/2019 20:40	7/3/2019 8:35	11.9	0.11	0.01	0.12	7.6	7/2/2019 20:35	7/3/2019 20:35	24.1	1.29	1.38	111,438
7/9/2019 21:20	7/10/2019 18:50	21.5	0.54	0.03	1.08	158.2	7/9/2019 21:20	7/11/2019 6:50	33.6	1.43	2.48	173,115
7/15/2019 11:20	7/15/2019 14:00	2.7	0.04	0.02	0.12	112.5	7/15/2019 11:15	7/16/2019 2:00	14.8	1.08	1.08	57,555
7/16/2019 2:45	7/16/2019 4:30	1.8	0.55	0.31	1.08	15.4	7/16/2019 2:45	7/16/2019 16:25	13.8	2.23	3.65	110,199
7/17/2019 5:35	7/17/2019 7:45	2.2	0.08	0.04	0.12	25.3	7/17/2019 5:35	7/17/2019 19:40	14.2	1.35	1.38	69,036
7/17/2019 21:50	7/18/2019 7:15	9.4	0.30	0.03	0.72	15.1	7/17/2019 21:45	7/18/2019 18:10	20.5	1.55	2.08	114,120
7/18/2019 18:15	7/19/2019 1:35	7.3	0.49	0.07	0.36	17.9	7/18/2019 18:10	7/19/2019 13:30	19.4	2.12	3.16	147,846
8/2/2019 3:00	8/2/2019 5:10	2.2	0.30	0.14	0.48	339.4	8/2/2019 2:55	8/2/2019 17:10	14.3	1.28	1.71	66,087
8/10/2019 3:50	8/10/2019 8:15	4.4	0.76	0.17	0.60	191.7	8/10/2019 3:45	8/10/2019 20:10	16.5	2.25	3.91	133,455
8/21/2019 5:20	8/21/2019 7:55	2.6	0.11	0.04	0.24	261.4	8/21/2019 5:15	8/21/2019 16:05	10.9	1.19	1.38	46,926
8/21/2019 16:05	8/21/2019 22:00	5.9	0.12	0.02	0.24	8.3	8/21/2019 16:05	8/22/2019 7:15	15.3	1.28	1.38	70,242
8/22/2019 7:15	8/22/2019 8:45	1.5	0.04	0.03	0.12	10.8	8/22/2019 7:15	8/22/2019 20:45	13.6	1.20	1.22	58,440
8/29/2019 18:05	8/29/2019 23:40	5.6	0.25	0.04	0.24	178.8	8/29/2019 18:00	8/30/2019 11:40	17.8	1.25	1.38	80,136
9/7/2019 19:35	9/7/2019 22:30	2.9	0.52	0.18	0.72	212.5	9/7/2019 19:30	9/8/2019 5:10	9.8	2.11	2.92	74,151
9/8/2019 5:10	9/8/2019 8:40	3.5	0.07	0.02	0.12	8.0	9/8/2019 5:10	9/8/2019 15:10	10.1	1.53	1.71	55,602
9/8/2019 15:10	9/8/2019 17:50	2.7	0.60	0.23	3.72	8.8	9/8/2019 15:10	9/9/2019 2:10	11.1	2.64	4.17	105,234
9/9/2019 2:10	9/9/2019 18:05	15.9	0.83	0.05	0.96	10.0	9/9/2019 2:10	9/10/2019 6:00	27.9	2.70	5.03	271,797
9/10/2019 17:25	9/10/2019 18:45	1.3	0.55	0.41	1.08	23.7	9/10/2019 17:25	9/11/2019 6:40	13.3	3.43	5.64	164,832
9/12/2019 20:00	9/12/2019 22:20	2.3	0.34	0.15	0.96	49.5	9/12/2019 20:00	9/13/2019 10:15	14.3	1.85	2.27	95,376
9/14/2019 20:15	9/15/2019 12:30	16.3	0.83	0.05	0.36	46.4	9/14/2019 20:10	9/16/2019 0:30	28.4	2.51	3.65	257,211
9/16/2019 19:35	9/17/2019 4:00	8.4	0.05	0.01	0.24	32.8	9/16/2019 19:30	9/17/2019 6:55	11.5	1.22	1.38	50,556
9/17/2019 6:55	9/18/2019 5:10	22.3	0.82	0.04	2.04	6.6	9/17/2019 6:55	9/18/2019 17:10	34.3	2.41	4.17	297,481
9/22/2019 6:25	9/23/2019 0:45	18.3	0.51	0.03	0.36	101.1	9/22/2019 6:25	9/23/2019 11:00	28.7	1.62	2.08	167,358
9/23/2019 11:00	9/23/2019 14:30	3.5	0.10	0.03	0.12	11.1	9/23/2019 11:00	9/24/2019 1:05	14.2	1.51	1.54	77,148
9/24/2019 1:10	9/24/2019 9:35	8.4	0.08	0.01	0.12	11.5	9/24/2019 1:05	9/24/2019 21:30	20.5	1.40	1.54	103,620
9/26/2019 5:00	9/26/2019 10:30	5.5	0.27	0.05	0.36	49.3	9/26/2019 5:00	9/26/2019 22:25	17.5	1.49	1.89	93,681
9/27/2019 1:10	9/27/2019 5:30	4.3	0.35	0.08	0.60	17.6	9/27/2019 1:05	9/27/2019 13:30	12.5	1.94	2.48	87,123
9/27/2019 13:35	9/27/2019 23:05	9.5	0.38	0.04	0.60	8.9	9/27/2019 13:30	9/28/2019 11:00	21.6	2.10	2.70	162,819
9/29/2019 1:00	9/29/2019 6:45	5.8	0.04	0.01	0.12	30.2	9/29/2019 1:00	9/29/2019 18:40	17.8	1.39	1.71	88,629

Table D-2. Summary Statistics for Individual Storm Events at the EVAMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
10/1/2018 7:50	10/1/2018 20:40	12.8	0.47	0.04	0.02	0.2	10/1/2018 7:50	10/2/2018 8:35	24.8	0.62	1.22	54,999
10/2/2018 17:35	10/2/2018 18:30	0.9	0.06	0.07	0.01	0.1	10/2/2018 17:35	10/3/2018 6:30	13.0	0.50	0.57	23,226
10/5/2018 8:50	10/5/2018 19:45	10.9	0.57	0.05	0.02	0.2	10/5/2018 8:50	10/6/2018 7:40	22.9	0.74	1.40	61,404
10/8/2018 1:40	10/8/2018 5:25	3.8	0.03	0.01	0.01	0.1	10/8/2018 1:40	10/8/2018 10:15	8.7	0.39	0.39	12,168
10/8/2018 10:20	10/9/2018 7:30	21.2	0.91	0.04	0.03	0.4	10/8/2018 10:15	10/9/2018 19:25	33.3	0.93	1.60	111,684
10/23/2018 18:00	10/23/2018 19:00	1.0	0.04	0.04	0.01	0.1	10/23/2018 17:55	10/24/2018 6:55	13.1	0.39	0.47	18,537
10/25/2018 6:55	10/26/2018 9:00	26.1	0.89	0.03	0.02	0.2	10/25/2018 6:55	10/26/2018 20:55	38.1	0.66	1.74	90,891
10/27/2018 15:25	10/28/2018 6:30	15.1	1.37	0.09	0.08	1.0	10/27/2018 15:20	10/28/2018 16:50	25.6	1.62	2.58	149,313
10/28/2018 16:50	10/28/2018 21:45	4.9	0.13	0.03	0.01	0.1	10/28/2018 16:50	10/29/2018 8:10	15.4	0.82	0.92	45,246
10/29/2018 8:10	10/29/2018 14:20	6.2	0.07	0.01	0.02	0.2	10/29/2018 8:10	10/30/2018 2:15	18.2	0.62	0.67	40,638
10/30/2018 20:05	10/31/2018 2:10	6.1	0.19	0.03	0.02	0.2	10/30/2018 20:00	10/31/2018 14:10	18.3	0.61	0.79	39,813
10/31/2018 15:35	10/31/2018 20:15	4.7	0.06	0.01	0.01	0.1	10/31/2018 15:30	10/31/2018 23:45	8.3	0.60	0.67	18,060
10/31/2018 23:45	11/1/2018 10:30	10.8	0.24	0.02	0.01	0.1	10/31/2018 23:45	11/1/2018 22:30	22.8	0.68	0.92	55,764
11/1/2018 23:30	11/2/2018 17:30	18.0	0.68	0.04	0.05	0.6	11/1/2018 23:25	11/3/2018 5:25	30.1	0.83	1.74	90,111
11/3/2018 9:55	11/3/2018 19:50	9.9	0.25	0.03	0.01	0.1	11/3/2018 9:55	11/4/2018 4:40	18.8	0.55	0.67	37,206
11/4/2018 4:40	11/4/2018 6:10	1.5	0.08	0.05	0.02	0.2	11/4/2018 4:40	11/4/2018 15:45	11.2	0.49	0.57	19,764
11/4/2018 15:50	11/4/2018 21:15	5.4	0.24	0.04	0.06	0.7	11/4/2018 15:45	11/5/2018 9:10	17.5	0.51	0.67	32,160
11/5/2018 14:45	11/5/2018 18:10	3.4	0.08	0.02	0.02	0.2	11/5/2018 14:45	11/6/2018 6:10	15.5	0.47	0.47	26,130
11/9/2018 9:40	11/9/2018 11:55	2.3	0.09	0.04	0.01	0.1	11/9/2018 9:40	11/9/2018 23:55	14.3	0.38	0.39	19,830
11/14/2018 5:25	11/14/2018 9:20	3.9	0.10	0.03	0.02	0.2	11/14/2018 5:25	11/14/2018 21:20	16.0	0.33	0.39	19,083
11/15/2018 20:45	11/16/2018 7:35	10.8	0.15	0.01	0.01	0.1	11/15/2018 20:45	11/16/2018 19:30	22.8	0.39	0.39	32,016
11/21/2018 21:45	11/23/2018 19:50	46.1	1.34	0.03	0.07	0.8	11/21/2018 21:40	11/24/2018 7:50	58.3	0.74	1.40	154,150
11/26/2018 4:15	11/27/2018 6:35	26.3	1.35	0.05	0.02	0.2	11/26/2018 4:15	11/27/2018 15:10	35.0	1.20	2.22	151,224
11/27/2018 15:10	11/27/2018 20:20	5.2	0.31	0.06	0.08	1.0	11/27/2018 15:10	11/28/2018 4:05	13.0	1.11	1.40	51,924
11/28/2018 4:10	11/28/2018 11:25	7.3	0.22	0.03	0.04	0.5	11/28/2018 4:05	11/28/2018 14:15	10.3	1.05	1.22	38,832
11/28/2018 14:20	11/28/2018 17:55	3.6	0.07	0.02	0.01	0.1	11/28/2018 14:15	11/29/2018 5:55	15.8	0.73	0.92	41,634
11/30/2018 19:20	11/30/2018 21:45	2.4	0.19	0.08	0.02	0.2	11/30/2018 19:15	12/1/2018 9:40	14.5	0.64	0.79	33,294
12/1/2018 10:35	12/1/2018 11:25	0.8	0.03	0.04	0.01	0.1	12/1/2018 10:30	12/1/2018 23:25	13.0	0.56	0.57	26,256
12/9/2018 9:35	12/9/2018 21:05	11.5	0.69	0.06	0.02	0.2	12/9/2018 9:30	12/10/2018 9:00	23.6	0.73	1.06	62,226
12/10/2018 11:05	12/10/2018 11:15	0.2	0.04	0.24	0.02	0.2	12/10/2018 11:00	12/10/2018 23:10	12.3	0.51	0.57	22,437
12/11/2018 3:25	12/12/2018 0:35	21.2	0.66	0.03	0.05	0.6	12/11/2018 3:20	12/12/2018 12:30	33.3	0.94	1.90	112,077
12/12/2018 21:35	12/13/2018 3:35	6.0	0.04	0.01	0.01	0.1	12/12/2018 21:30	12/13/2018 7:05	9.7	0.67	0.67	23,316
12/13/2018 7:05	12/13/2018 17:00	9.9	0.10	0.01	0.01	0.1	12/13/2018 7:05	12/14/2018 5:00	22.0	0.67	0.67	53,064
12/15/2018 22:55	12/16/2018 5:35	6.7	0.27	0.04	0.01	0.1	12/15/2018 22:50	12/16/2018 14:45	16.0	0.94	1.22	54,207
12/16/2018 14:45	12/16/2018 21:50	7.1	0.18	0.03	0.01	0.1	12/16/2018 14:45	12/17/2018 9:45	19.1	0.96	1.06	65,736
12/17/2018 17:15	12/18/2018 8:10	14.9	0.57	0.04	0.02	0.2	12/17/2018 17:10	12/18/2018 13:40	20.6	1.27	1.74	94,332
12/18/2018 13:45	12/18/2018 18:30	4.8	0.27	0.06	0.03	0.4	12/18/2018 13:40	12/19/2018 6:30	16.9	1.12	1.60	68,175
12/20/2018 1:55	12/20/2018 16:35	14.7	0.21	0.01	0.02	0.2	12/20/2018 1:50	12/21/2018 4:30	26.8	0.75	0.92	72,063
12/22/2018 18:00	12/23/2018 13:10	19.2	0.74	0.04	0.03	0.4	12/22/2018 17:55	12/24/2018 1:05	31.3	1.00	1.74	112,983
12/26/2018 9:40	12/26/2018 11:45	2.1	0.05	0.02	0.01	0.1	12/26/2018 9:40	12/26/2018 23:45	14.2	0.65	0.67	33,090
12/27/2018 2:55	12/27/2018 8:45	5.8	0.04	0.01	0.01	0.1	12/27/2018 2:55	12/27/2018 20:45	17.9	0.60	0.67	38,505
12/28/2018 7:25	12/28/2018 21:35	14.2	0.80	0.06	0.02	0.2	12/28/2018 7:25	12/29/2018 9:30	26.2	1.09	1.90	103,140
12/29/2018 12:45	12/30/2018 2:40	13.9	0.80	0.06	0.05	0.6	12/29/2018 12:40	12/30/2018 14:35	26.0	1.32	1.90	123,126
1/2/2019 23:55	1/4/2019 3:25	27.5	0.91	0.03	0.03	0.4	1/2/2019 23:55	1/4/2019 6:30	30.7	0.95	1.60	105,159
1/4/2019 6:35	1/4/2019 12:45	6.2	0.04	0.01	0.01	0.1	1/4/2019 6:30	1/4/2019 13:15	6.8	0.72	0.79	17,814

Table D-2. Summary Statistics for Individual Storm Events at the EVAMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
1/4/2019 13:15	1/4/2019 18:15	5.0	0.08	0.02	0.01	0.1	1/4/2019 13:15	1/5/2019 6:10	17.0	0.64	0.67	39,024
1/5/2019 22:40	1/6/2019 3:00	4.3	0.11	0.03	0.01	0.1	1/5/2019 22:40	1/6/2019 14:55	16.3	0.55	0.57	32,256
1/6/2019 17:10	1/7/2019 0:20	7.2	0.51	0.07	0.02	0.2	1/6/2019 17:10	1/7/2019 12:20	19.3	0.78	1.22	54,240
1/8/2019 8:50	1/8/2019 20:15	11.4	0.17	0.01	0.01	0.1	1/8/2019 8:50	1/9/2019 1:40	16.9	0.56	0.57	33,873
1/9/2019 1:45	1/10/2019 13:50	36.1	0.38	0.01	0.02	0.2	1/9/2019 1:40	1/11/2019 1:50	48.3	0.55	0.57	95,080
1/17/2019 2:10	1/17/2019 3:40	1.5	0.11	0.07	0.01	0.1	1/17/2019 2:10	1/17/2019 15:40	13.6	0.55	0.57	26,973
1/18/2019 4:20	1/18/2019 5:25	1.1	0.04	0.04	0.01	0.1	1/18/2019 4:15	1/18/2019 17:25	13.3	0.49	0.57	23,199
1/18/2019 18:45	1/19/2019 1:55	7.2	0.19	0.03	0.02	0.2	1/18/2019 18:40	1/19/2019 13:30	18.9	0.58	0.67	39,597
1/19/2019 13:35	1/19/2019 16:40	3.1	0.04	0.01	0.01	0.1	1/19/2019 13:30	1/20/2019 4:40	15.3	0.56	0.57	30,483
1/22/2019 13:55	1/23/2019 9:55	20.0	1.00	0.05	0.02	0.2	1/22/2019 13:50	1/23/2019 21:55	32.2	0.88	1.22	101,877
2/1/2019 4:40	2/1/2019 21:15	16.6	0.69	0.04	0.02	0.2	2/1/2019 4:40	2/2/2019 9:10	28.6	0.85	1.06	87,477
2/5/2019 10:50	2/5/2019 13:55	3.1	0.54	0.18	0.03	0.4	2/5/2019 10:50	2/6/2019 1:50	15.1	0.61	0.67	32,901
2/9/2019 14:15	2/9/2019 16:25	2.2	0.04	0.02	0.01	0.1	2/9/2019 14:10	2/10/2019 4:25	14.3	0.57	0.57	29,412
2/11/2019 11:25	2/11/2019 15:50	4.4	0.11	0.02	0.02	0.2	2/11/2019 11:25	2/12/2019 3:50	16.5	0.65	0.67	38,538
2/12/2019 11:20	2/13/2019 13:35	26.3	0.96	0.04	0.01	0.1	2/12/2019 11:15	2/14/2019 1:30	38.3	1.16	1.40	159,837
2/14/2019 14:20	2/14/2019 20:40	6.3	0.25	0.04	0.01	0.1	2/14/2019 14:20	2/15/2019 8:35	18.3	1.54	1.74	101,916
2/16/2019 7:50	2/16/2019 22:30	14.7	0.37	0.03	0.01	0.1	2/16/2019 7:50	2/17/2019 10:25	26.7	1.51	1.90	144,978
2/19/2019 13:35	2/20/2019 3:00	13.4	0.39	0.03	0.02	0.2	2/19/2019 13:30	2/20/2019 14:55	25.5	1.52	1.90	139,248
2/22/2019 8:30	2/22/2019 16:20	7.8	0.25	0.03	0.02	0.2	2/22/2019 8:25	2/23/2019 4:15	19.9	1.25	1.60	89,508
2/23/2019 12:55	2/23/2019 20:45	7.8	0.19	0.02	0.02	0.2	2/23/2019 12:55	2/24/2019 8:45	19.9	1.32	1.40	94,872
3/6/2019 13:45	3/6/2019 19:45	6.0	0.11	0.02	0.01	0.1	3/6/2019 13:40	3/7/2019 7:40	18.1	0.79	0.79	51,429
3/7/2019 9:40	3/7/2019 16:20	6.7	0.18	0.03	0.02	0.2	3/7/2019 9:40	3/8/2019 4:15	18.7	0.88	0.92	59,445
3/8/2019 9:00	3/8/2019 9:50	0.8	0.06	0.07	0.01	0.1	3/8/2019 8:55	3/8/2019 21:45	12.9	0.81	0.92	37,788
3/11/2019 17:55	3/12/2019 20:30	26.6	1.35	0.05	0.03	0.4	3/11/2019 17:55	3/13/2019 4:25	34.6	1.26	2.40	156,867
3/13/2019 4:30	3/13/2019 5:35	1.1	0.07	0.06	0.02	0.2	3/13/2019 4:25	3/13/2019 17:35	13.3	0.70	0.79	33,615
3/25/2019 17:15	3/26/2019 5:15	12.0	0.26	0.02	0.02	0.2	3/25/2019 17:10	3/26/2019 17:10	24.1	0.49	0.57	42,099
4/3/2019 1:20	4/3/2019 10:30	9.2	0.11	0.01	0.01	0.1	4/3/2019 1:20	4/3/2019 22:25	21.2	0.47	0.47	35,670
4/4/2019 23:35	4/5/2019 6:15	6.7	0.17	0.03	0.01	0.1	4/4/2019 23:35	4/5/2019 11:35	12.1	0.46	0.47	20,085
4/5/2019 11:35	4/5/2019 17:45	6.2	0.29	0.05	0.05	0.6	4/5/2019 11:35	4/6/2019 5:45	18.3	0.55	0.79	36,027
4/6/2019 6:45	4/6/2019 14:55	8.2	0.13	0.02	0.04	0.5	4/6/2019 6:40	4/6/2019 21:40	15.1	0.48	0.57	25,881
4/6/2019 21:40	4/7/2019 4:50	7.2	0.42	0.06	0.01	0.1	4/6/2019 21:40	4/7/2019 16:50	19.3	0.69	1.06	47,961
4/8/2019 17:25	4/9/2019 12:20	18.9	0.55	0.03	0.05	0.6	4/8/2019 17:25	4/10/2019 0:20	31.0	0.68	1.22	75,858
4/10/2019 10:25	4/11/2019 14:20	27.9	0.49	0.02	0.02	0.2	4/10/2019 10:25	4/11/2019 21:10	34.8	0.67	0.79	84,396
4/11/2019 21:15	4/12/2019 6:35	9.3	0.57	0.06	0.08	1.0	4/11/2019 21:10	4/12/2019 18:30	21.4	0.96	1.60	74,247
4/13/2019 5:50	4/13/2019 15:45	9.9	0.29	0.03	0.01	0.1	4/13/2019 5:45	4/14/2019 3:40	22.0	0.70	0.79	55,314
4/14/2019 17:45	4/14/2019 21:40	3.9	0.06	0.02	0.01	0.1	4/14/2019 17:45	4/15/2019 9:40	16.0	0.56	0.57	32,382
4/16/2019 17:00	4/16/2019 19:40	2.7	0.11	0.04	0.01	0.1	4/16/2019 17:00	4/17/2019 7:40	14.8	0.49	0.57	26,067
4/18/2019 4:55	4/18/2019 7:15	2.3	0.12	0.05	0.02	0.2	4/18/2019 4:50	4/18/2019 17:55	13.2	0.51	0.57	24,078
4/18/2019 18:00	4/18/2019 22:45	4.8	0.11	0.02	0.01	0.1	4/18/2019 17:55	4/19/2019 4:15	10.4	0.53	0.57	20,025
4/19/2019 4:15	4/19/2019 22:50	18.6	0.29	0.02	0.02	0.2	4/19/2019 4:15	4/20/2019 10:50	30.7	0.73	0.92	81,030
4/22/2019 11:05	4/22/2019 18:20	7.3	0.32	0.04	0.02	0.2	4/22/2019 11:00	4/23/2019 6:20	19.4	0.72	1.06	50,502
4/27/2019 14:20	4/27/2019 14:50	0.5	0.15	0.30	0.04	0.5	4/27/2019 14:20	4/28/2019 2:45	12.5	0.50	0.67	22,278
5/14/2019 8:30	5/14/2019 14:50	6.3	0.21	0.03	0.09	1.1	5/14/2019 8:30	5/15/2019 2:45	18.3	0.33	0.47	21,675
5/15/2019 16:25	5/15/2019 19:25	3.0	0.07	0.02	0.01	0.1	5/15/2019 16:25	5/16/2019 7:25	15.1	0.31	0.32	16,980
5/16/2019 10:40	5/17/2019 6:45	20.1	0.85	0.04	0.02	0.2	5/16/2019 10:40	5/17/2019 18:40	32.1	0.60	1.40	69,414

Table D-2. Summary Statistics for Individual Storm Events at the EVAMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
5/20/2019 9:05	5/20/2019 22:35	13.5	0.30	0.02	0.01	0.1	5/20/2019 9:00	5/21/2019 10:30	25.6	0.38	0.47	34,959
5/24/2019 9:35	5/24/2019 10:55	1.3	0.04	0.03	0.01	0.1	5/24/2019 9:30	5/24/2019 22:50	13.4	0.30	0.32	14,376
5/25/2019 11:50	5/25/2019 16:30	4.7	0.17	0.04	0.01	0.1	5/25/2019 11:45	5/26/2019 4:25	16.8	0.36	0.47	21,465
6/6/2019 15:35	6/6/2019 19:00	3.4	0.09	0.03	0.02	0.2	6/6/2019 15:30	6/7/2019 5:15	13.8	0.32	0.39	16,146
6/7/2019 5:20	6/7/2019 9:35	4.3	0.08	0.02	0.04	0.5	6/7/2019 5:15	6/7/2019 21:30	16.3	0.35	0.39	20,664
6/18/2019 5:50	6/18/2019 7:10	1.3	0.03	0.02	0.01	0.1	6/18/2019 5:45	6/18/2019 19:05	13.4	0.31	0.32	15,096
6/19/2019 15:50	6/20/2019 3:00	11.2	0.60	0.05	0.03	0.4	6/19/2019 15:50	6/20/2019 14:55	23.2	0.49	0.92	41,145
6/23/2019 6:30	6/23/2019 9:10	2.7	0.04	0.02	0.01	0.1	6/23/2019 6:30	6/23/2019 21:10	14.8	0.33	0.39	17,349
6/23/2019 23:20	6/24/2019 2:05	2.8	0.03	0.01	0.01	0.1	6/23/2019 23:20	6/24/2019 14:00	14.8	0.33	0.39	17,601
6/26/2019 14:40	6/26/2019 14:55	0.3	0.04	0.16	0.01	0.1	6/26/2019 14:35	6/27/2019 1:50	11.3	0.34	0.39	13,758
6/27/2019 1:50	6/27/2019 6:25	4.6	0.08	0.02	0.02	0.2	6/27/2019 1:50	6/27/2019 18:20	16.6	0.42	0.47	24,882
7/2/2019 10:35	7/2/2019 13:25	2.8	0.27	0.10	0.03	0.4	7/2/2019 10:30	7/2/2019 20:35	10.2	0.51	0.67	18,786
7/2/2019 20:40	7/3/2019 8:35	11.9	0.11	0.01	0.01	0.1	7/2/2019 20:35	7/3/2019 20:35	24.1	0.47	0.57	40,773
7/9/2019 21:20	7/10/2019 18:50	21.5	0.54	0.03	0.09	1.1	7/9/2019 21:20	7/11/2019 6:50	33.6	0.57	1.22	68,568
7/15/2019 11:20	7/15/2019 14:00	2.7	0.04	0.02	0.01	0.1	7/15/2019 11:15	7/16/2019 2:00	14.8	0.39	0.47	21,018
7/16/2019 2:45	7/16/2019 4:30	1.8	0.55	0.31	0.09	1.1	7/16/2019 2:45	7/16/2019 16:25	13.8	0.95	2.22	46,806
7/17/2019 5:35	7/17/2019 7:45	2.2	0.08	0.04	0.01	0.1	7/17/2019 5:35	7/17/2019 19:40	14.2	0.41	0.47	20,778
7/17/2019 21:50	7/18/2019 7:15	9.4	0.30	0.03	0.06	0.7	7/17/2019 21:45	7/18/2019 18:10	20.5	0.58	0.92	43,011
7/18/2019 18:15	7/19/2019 1:35	7.3	0.49	0.07	0.03	0.4	7/18/2019 18:10	7/19/2019 13:30	19.4	0.83	1.40	57,894
8/2/2019 3:00	8/2/2019 5:10	2.2	0.30	0.14	0.04	0.5	8/2/2019 2:55	8/2/2019 17:10	14.3	0.44	0.67	22,830
8/10/2019 3:50	8/10/2019 8:15	4.4	0.76	0.17	0.05	0.6	8/10/2019 3:45	8/10/2019 20:10	16.5	0.80	1.90	47,601
8/21/2019 5:20	8/21/2019 7:55	2.6	0.11	0.04	0.02	0.2	8/21/2019 5:15	8/21/2019 16:05	10.9	0.34	0.39	13,542
8/21/2019 16:05	8/21/2019 22:00	5.9	0.12	0.02	0.02	0.2	8/21/2019 16:05	8/22/2019 7:15	15.3	0.38	0.39	21,033
8/22/2019 7:15	8/22/2019 8:45	1.5	0.04	0.03	0.01	0.1	8/22/2019 7:15	8/22/2019 20:45	13.6	0.36	0.39	17,391
8/29/2019 18:05	8/29/2019 23:40	5.6	0.25	0.04	0.02	0.2	8/29/2019 18:00	8/30/2019 11:40	17.8	0.40	0.47	25,326
9/7/2019 19:35	9/7/2019 22:30	2.9	0.52	0.18	0.06	0.7	9/7/2019 19:30	9/8/2019 5:10	9.8	0.68	1.06	24,012
9/8/2019 5:10	9/8/2019 8:40	3.5	0.07	0.02	0.01	0.1	9/8/2019 5:10	9/8/2019 15:10	10.1	0.51	0.67	18,351
9/8/2019 15:10	9/8/2019 17:50	2.7	0.60	0.23	0.31	3.7	9/8/2019 15:10	9/9/2019 2:10	11.1	0.77	1.22	30,906
9/9/2019 2:10	9/9/2019 18:05	15.9	0.83	0.05	0.08	1.0	9/9/2019 2:10	9/10/2019 6:00	27.9	0.97	2.22	97,551
9/10/2019 17:25	9/10/2019 18:45	1.3	0.55	0.41	0.09	1.1	9/10/2019 17:25	9/11/2019 6:40	13.3	1.03	2.06	49,203
9/12/2019 20:00	9/12/2019 22:20	2.3	0.34	0.15	0.08	1.0	9/12/2019 20:00	9/13/2019 10:15	14.3	0.62	0.92	32,199
9/14/2019 20:15	9/15/2019 12:30	16.3	0.83	0.05	0.03	0.4	9/14/2019 20:10	9/16/2019 0:30	28.4	0.90	1.60	92,481
9/16/2019 19:35	9/17/2019 4:00	8.4	0.05	0.01	0.02	0.2	9/16/2019 19:30	9/17/2019 6:55	11.5	0.44	0.47	18,186
9/17/2019 6:55	9/18/2019 5:10	22.3	0.82	0.04	0.17	2.0	9/17/2019 6:55	9/18/2019 17:10	34.3	0.87	1.74	108,027
9/22/2019 6:25	9/23/2019 0:45	18.3	0.51	0.03	0.03	0.4	9/22/2019 6:25	9/23/2019 11:00	28.7	0.63	0.92	64,539
9/23/2019 11:00	9/23/2019 14:30	3.5	0.10	0.03	0.01	0.1	9/23/2019 11:00	9/24/2019 1:05	14.2	0.58	0.67	29,820
9/24/2019 1:10	9/24/2019 9:35	8.4	0.08	0.01	0.01	0.1	9/24/2019 1:05	9/24/2019 21:30	20.5	0.55	0.57	40,656
9/26/2019 5:00	9/26/2019 10:30	5.5	0.27	0.05	0.03	0.4	9/26/2019 5:00	9/26/2019 22:25	17.5	0.62	0.79	39,366
9/27/2019 1:10	9/27/2019 5:30	4.3	0.35	0.08	0.05	0.6	9/27/2019 1:05	9/27/2019 13:30	12.5	0.76	0.92	34,308
9/27/2019 13:35	9/27/2019 23:05	9.5	0.38	0.04	0.05	0.6	9/27/2019 13:30	9/28/2019 11:00	21.6	0.77	1.06	59,904
9/29/2019 1:00	9/29/2019 6:45	5.8	0.04	0.01	0.01	0.1	9/29/2019 1:00	9/29/2019 18:40	17.8	0.58	0.79	37,095

Table D-3. Summary Statistics for Individual Storm Events at the MONM Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
10/1/2018 8:00	10/1/2018 19:45	11.8	0.38	0.03	0.24	33.2	10/1/2018 8:00	10/2/2018 7:40	23.8	0.46	1.00	39,312
10/5/2018 8:50	10/5/2018 19:25	10.6	0.50	0.05	0.24	86.2	10/5/2018 8:50	10/6/2018 7:25	22.7	0.75	1.39	61,332
10/8/2018 3:05	10/8/2018 5:35	2.5	0.03	0.01	0.12	57.2	10/8/2018 3:00	10/8/2018 10:15	7.3	0.26	0.28	6,936
10/8/2018 10:20	10/9/2018 7:25	21.1	0.86	0.04	0.36	64.4	10/8/2018 10:15	10/9/2018 19:25	33.3	1.35	2.40	161,805
10/25/2018 7:20	10/26/2018 8:50	25.5	0.78	0.03	0.36	385.1	10/25/2018 7:15	10/26/2018 20:45	37.6	0.85	1.85	115,647
10/27/2018 15:00	10/28/2018 10:50	19.8	1.22	0.06	0.48	34.2	10/27/2018 14:55	10/28/2018 16:50	26.0	2.74	5.32	256,647
10/28/2018 16:55	10/28/2018 21:45	4.8	0.05	0.01	0.12	10.8	10/28/2018 16:50	10/29/2018 9:40	16.9	1.63	2.12	99,501
10/29/2018 13:50	10/29/2018 14:10	0.3	0.05	0.15	0.12	20.5	10/29/2018 13:50	10/30/2018 2:10	12.4	1.00	1.18	44,862
10/30/2018 20:05	10/31/2018 2:20	6.3	0.17	0.03	0.12	30.2	10/30/2018 20:00	10/31/2018 14:15	18.3	0.83	1.09	54,891
10/31/2018 16:05	10/31/2018 22:05	6.0	0.03	0.01	0.12	18.1	10/31/2018 16:05	11/1/2018 1:25	9.4	0.60	0.63	20,187
11/1/2018 1:30	11/1/2018 10:15	8.8	0.20	0.02	0.12	27.5	11/1/2018 1:25	11/1/2018 22:15	20.9	0.91	1.28	68,328
11/1/2018 23:30	11/2/2018 17:20	17.8	0.66	0.04	0.48	14.3	11/1/2018 23:25	11/3/2018 5:20	30.0	1.74	3.22	187,623
11/3/2018 8:55	11/3/2018 18:55	10.0	0.22	0.02	0.12	20.0	11/3/2018 8:55	11/4/2018 4:30	19.7	1.32	1.73	93,594
11/4/2018 4:35	11/4/2018 6:00	1.4	0.06	0.04	0.12	14.3	11/4/2018 4:30	11/4/2018 16:15	11.8	1.03	1.18	43,695
11/4/2018 16:15	11/4/2018 18:30	2.3	0.12	0.05	0.84	11.5	11/4/2018 16:15	11/5/2018 6:30	14.3	0.94	1.18	48,366
11/5/2018 18:00	11/5/2018 23:55	5.9	0.03	0.01	0.12	25.7	11/5/2018 17:55	11/6/2018 11:55	18.1	0.64	0.70	41,418
11/9/2018 9:50	11/9/2018 12:50	3.0	0.07	0.02	0.12	113.5	11/9/2018 9:45	11/10/2018 0:45	15.1	0.40	0.46	21,492
11/14/2018 5:25	11/14/2018 8:35	3.2	0.08	0.03	0.12	114.4	11/14/2018 5:25	11/14/2018 20:35	15.3	0.37	0.46	20,451
11/15/2018 23:45	11/16/2018 6:05	6.3	0.12	0.02	0.12	39.9	11/15/2018 23:45	11/16/2018 18:05	18.4	0.45	0.63	29,985
11/21/2018 21:45	11/22/2018 6:30	8.8	0.13	0.01	0.12	139.2	11/21/2018 21:40	11/22/2018 13:50	16.3	0.38	0.46	22,203
11/22/2018 13:50	11/23/2018 19:40	29.8	1.07	0.04	0.48	9.8	11/22/2018 13:50	11/24/2018 7:40	41.9	1.97	2.71	297,614
11/26/2018 4:10	11/27/2018 6:15	26.1	1.50	0.06	0.24	61.3	11/26/2018 4:05	11/27/2018 14:55	34.9	3.44	6.91	432,519
11/27/2018 14:55	11/27/2018 20:20	5.4	0.39	0.07	0.72	9.0	11/27/2018 14:55	11/28/2018 3:55	13.1	3.82	4.85	179,841
11/28/2018 4:00	11/28/2018 11:20	7.3	0.22	0.03	0.36	8.5	11/28/2018 3:55	11/28/2018 14:15	10.4	3.54	4.40	132,636
11/28/2018 14:20	11/28/2018 17:40	3.3	0.06	0.02	0.12	8.6	11/28/2018 14:15	11/29/2018 5:35	15.4	2.61	3.04	144,828
11/30/2018 19:20	11/30/2018 21:55	2.6	0.20	0.08	0.24	52.3	11/30/2018 19:15	12/1/2018 8:15	13.1	1.59	1.98	74,769
12/1/2018 8:20	12/1/2018 12:25	4.1	0.03	0.01	0.12	10.9	12/1/2018 8:15	12/2/2018 0:20	16.2	1.18	1.39	68,586
12/9/2018 9:30	12/10/2018 2:20	16.8	0.66	0.04	0.12	204.1	12/9/2018 9:30	12/10/2018 14:20	28.9	1.75	2.71	181,815
12/11/2018 3:35	12/11/2018 22:35	19.0	0.61	0.03	0.96	31.8	12/11/2018 3:30	12/12/2018 10:30	31.1	2.03	3.59	227,259
12/12/2018 20:50	12/13/2018 6:55	10.1	0.08	0.01	0.12	24.1	12/12/2018 20:50	12/13/2018 10:50	14.1	1.42	1.49	72,189
12/13/2018 10:55	12/13/2018 16:05	5.2	0.03	0.01	0.12	13.4	12/13/2018 10:50	12/14/2018 4:05	17.3	1.18	1.39	73,794
12/15/2018 22:55	12/16/2018 6:25	7.5	0.31	0.04	0.12	73.4	12/15/2018 22:50	12/16/2018 14:15	15.5	1.46	1.98	81,222
12/16/2018 14:20	12/16/2018 21:45	7.4	0.21	0.03	0.36	10.1	12/16/2018 14:15	12/17/2018 5:25	15.3	1.74	2.12	95,550
12/17/2018 5:30	12/17/2018 6:10	0.7	0.03	0.05	0.12	8.0	12/17/2018 5:25	12/17/2018 17:15	11.9	1.43	1.61	61,338
12/17/2018 17:20	12/18/2018 8:05	14.8	0.53	0.04	0.24	19.8	12/17/2018 17:15	12/18/2018 13:30	20.3	2.44	3.40	178,449
12/18/2018 13:35	12/18/2018 18:20	4.8	0.32	0.07	0.48	7.2	12/18/2018 13:30	12/19/2018 6:20	16.9	3.08	4.19	187,827
12/20/2018 1:55	12/20/2018 10:50	8.9	0.21	0.02	0.24	31.9	12/20/2018 1:50	12/20/2018 22:50	21.1	1.86	2.26	141,543
12/22/2018 17:50	12/23/2018 13:25	19.6	0.78	0.04	0.36	55.4	12/22/2018 17:45	12/24/2018 1:25	31.8	2.51	4.62	287,322
12/26/2018 9:25	12/26/2018 11:45	2.3	0.05	0.02	0.12	72.7	12/26/2018 9:20	12/26/2018 23:45	14.5	0.88	0.92	46,056
12/27/2018 2:35	12/27/2018 3:05	0.5	0.05	0.10	0.36	16.2	12/27/2018 2:35	12/27/2018 15:00	12.5	0.83	0.92	37,149
12/28/2018 5:05	12/28/2018 21:35	16.5	0.72	0.04	0.24	26.1	12/28/2018 5:00	12/29/2018 9:30	28.6	2.33	3.98	239,424
12/29/2018 13:05	12/30/2018 3:00	13.9	1.02	0.07	0.60	16.6	12/29/2018 13:05	12/30/2018 15:00	26.0	4.98	8.75	466,074
1/2/2019 23:55	1/4/2019 7:00	31.1	1.07	0.03	0.36	93.6	1/2/2019 23:55	1/4/2019 15:20	39.5	3.10	6.91	440,757

Table D-3. Summary Statistics for Individual Storm Events at the MONM Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
1/4/2019 15:25	1/4/2019 18:50	3.4	0.03	0.01	0.12	10.8	1/4/2019 15:20	1/5/2019 6:50	15.6	2.45	2.87	137,289
1/5/2019 21:55	1/6/2019 3:05	5.2	0.19	0.04	0.24	41.3	1/5/2019 21:55	1/6/2019 15:00	17.2	1.90	2.26	117,387
1/6/2019 17:20	1/7/2019 0:05	6.8	0.47	0.07	0.24	15.2	1/6/2019 17:15	1/7/2019 12:00	18.8	2.94	4.40	199,383
1/8/2019 8:45	1/10/2019 10:00	49.3	0.57	0.01	0.24	34.8	1/8/2019 8:45	1/10/2019 10:35	49.9	1.85	2.26	333,218
1/10/2019 10:35	1/10/2019 13:35	3.0	0.04	0.01	0.12	6.3	1/10/2019 10:35	1/11/2019 1:30	15.0	1.81	2.12	97,617
1/17/2019 2:15	1/17/2019 3:20	1.1	0.08	0.07	0.12	159.7	1/17/2019 2:10	1/17/2019 15:20	13.3	0.73	0.84	34,911
1/18/2019 18:45	1/19/2019 2:25	7.7	0.16	0.02	0.24	39.8	1/18/2019 18:40	1/19/2019 14:25	19.8	0.90	1.18	63,918
1/22/2019 13:45	1/23/2019 9:45	20.0	0.85	0.04	0.24	88.3	1/22/2019 13:40	1/23/2019 21:40	32.1	2.32	3.40	267,755
2/1/2019 4:40	2/1/2019 21:45	17.1	0.64	0.04	0.12	212.8	2/1/2019 4:40	2/2/2019 9:40	29.1	1.64	2.40	171,564
2/5/2019 11:55	2/5/2019 14:40	2.8	0.18	0.07	0.36	89.2	2/5/2019 11:55	2/6/2019 2:40	14.8	0.65	0.77	34,866
2/9/2019 13:55	2/9/2019 17:00	3.1	0.17	0.06	0.12	97.2	2/9/2019 13:50	2/10/2019 5:00	15.3	0.55	0.63	30,375
2/11/2019 12:00	2/11/2019 16:10	4.2	0.11	0.03	0.12	44.2	2/11/2019 11:55	2/12/2019 4:05	16.3	0.59	0.63	34,749
2/12/2019 11:35	2/13/2019 13:45	26.2	0.98	0.04	0.12	21.8	2/12/2019 11:35	2/14/2019 1:40	38.2	1.34	1.85	184,668
2/14/2019 8:55	2/14/2019 20:25	11.5	0.25	0.02	0.24	19.5	2/14/2019 8:55	2/15/2019 8:25	23.6	2.06	2.87	175,224
2/16/2019 8:00	2/16/2019 22:20	14.3	0.45	0.03	0.12	36.6	2/16/2019 8:00	2/17/2019 10:20	26.4	3.39	5.08	322,701
2/19/2019 13:35	2/20/2019 3:25	13.8	0.31	0.02	0.12	64.8	2/19/2019 13:30	2/20/2019 15:20	25.9	2.82	3.59	263,412
2/22/2019 8:35	2/22/2019 16:40	8.1	0.22	0.03	0.24	55.8	2/22/2019 8:35	2/23/2019 4:40	20.2	2.05	2.71	148,917
2/23/2019 13:55	2/23/2019 23:25	9.5	0.23	0.02	0.48	23.6	2/23/2019 13:50	2/24/2019 11:25	21.7	2.32	2.87	180,789
3/6/2019 13:20	3/6/2019 19:20	6.0	0.10	0.02	0.12	256.8	3/6/2019 13:15	3/7/2019 7:20	18.2	0.64	0.77	41,964
3/7/2019 9:15	3/7/2019 11:10	1.9	0.21	0.11	0.24	16.2	3/7/2019 9:10	3/7/2019 23:10	14.1	1.03	1.28	52,086
3/8/2019 8:25	3/8/2019 10:20	1.9	0.13	0.07	0.24	21.4	3/8/2019 8:25	3/8/2019 22:20	14.0	1.02	1.28	51,174
3/11/2019 17:40	3/12/2019 20:35	26.9	1.28	0.05	0.36	79.5	3/11/2019 17:35	3/13/2019 8:35	39.1	3.79	7.19	533,199
3/25/2019 17:15	3/26/2019 4:25	11.2	0.25	0.02	0.24	309.0	3/25/2019 17:10	3/26/2019 16:25	23.3	0.74	1.00	61,920
4/3/2019 3:40	4/3/2019 9:40	6.0	0.10	0.02	0.24	194.5	4/3/2019 3:40	4/3/2019 21:40	18.1	0.41	0.46	26,706
4/4/2019 21:35	4/5/2019 4:30	6.9	0.18	0.03	0.12	37.0	4/4/2019 21:30	4/5/2019 11:45	14.3	0.56	0.84	28,992
4/5/2019 11:45	4/5/2019 18:15	6.5	0.32	0.05	0.60	8.1	4/5/2019 11:45	4/6/2019 6:10	18.5	1.15	1.73	76,758
4/6/2019 6:10	4/6/2019 13:00	6.8	0.16	0.02	0.24	14.9	4/6/2019 6:10	4/6/2019 22:05	16.0	0.95	1.18	54,984
4/6/2019 22:05	4/7/2019 4:25	6.3	0.32	0.05	0.12	9.2	4/6/2019 22:05	4/7/2019 16:25	18.4	1.42	1.98	93,897
4/8/2019 17:20	4/9/2019 12:00	18.7	0.32	0.02	0.36	37.8	4/8/2019 17:15	4/10/2019 0:00	30.8	1.02	1.61	113,229
4/10/2019 10:35	4/11/2019 6:50	20.3	0.34	0.02	0.24	23.4	4/10/2019 10:30	4/11/2019 11:55	25.5	1.06	1.61	97,392
4/11/2019 12:00	4/11/2019 14:25	2.4	0.04	0.02	0.12	7.2	4/11/2019 11:55	4/11/2019 20:00	8.2	1.21	1.28	35,682
4/11/2019 20:00	4/12/2019 5:40	9.7	0.34	0.04	0.24	8.0	4/11/2019 20:00	4/12/2019 17:35	21.7	2.00	2.87	155,805
4/13/2019 5:45	4/13/2019 15:20	9.6	0.25	0.03	0.12	28.1	4/13/2019 5:45	4/14/2019 3:20	21.7	1.50	1.98	116,751
4/16/2019 17:05	4/16/2019 19:20	2.3	0.10	0.04	0.12	78.3	4/16/2019 17:00	4/17/2019 7:15	14.3	0.70	0.84	36,345
4/18/2019 5:50	4/18/2019 7:20	1.5	0.10	0.07	0.24	35.2	4/18/2019 5:50	4/18/2019 18:40	12.9	0.74	0.84	34,182
4/18/2019 18:45	4/18/2019 19:50	1.1	0.07	0.06	0.12	12.1	4/18/2019 18:40	4/19/2019 4:05	9.5	0.78	0.92	26,664
4/19/2019 4:05	4/19/2019 16:00	11.9	0.13	0.01	0.12	8.8	4/19/2019 4:05	4/20/2019 3:55	23.9	0.95	1.28	82,041
4/22/2019 10:50	4/22/2019 17:45	6.9	0.26	0.04	0.12	68.8	4/22/2019 10:50	4/23/2019 5:45	19.0	0.98	1.49	67,146
5/14/2019 8:30	5/14/2019 12:30	4.0	0.05	0.01	0.12	519.6	5/14/2019 8:30	5/15/2019 0:30	16.1	0.23	0.24	13,095
5/15/2019 16:40	5/15/2019 19:30	2.8	0.06	0.02	0.12	31.7	5/15/2019 16:40	5/16/2019 7:30	14.9	0.23	0.24	12,204
5/16/2019 10:50	5/17/2019 6:25	19.6	0.83	0.04	0.24	17.1	5/16/2019 10:50	5/17/2019 18:20	31.6	1.11	2.12	126,336
5/20/2019 9:30	5/20/2019 22:40	13.2	0.31	0.02	0.12	77.2	5/20/2019 9:30	5/21/2019 10:40	25.3	0.63	1.00	57,153
5/24/2019 8:55	5/24/2019 10:20	1.4	0.03	0.02	0.12	83.7	5/24/2019 8:55	5/24/2019 22:15	13.4	0.23	0.24	11,286

Table D-3. Summary Statistics for Individual Storm Events at the MONM Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
5/25/2019 12:00	5/25/2019 16:25	4.4	0.16	0.04	0.12	110.8	5/25/2019 12:00	5/26/2019 4:25	16.5	0.40	0.63	23,904
6/6/2019 14:20	6/6/2019 18:10	3.8	0.08	0.02	0.36	286.8	6/6/2019 14:15	6/7/2019 6:10	16.0	0.19	0.21	10,656
6/7/2019 8:35	6/7/2019 12:30	3.9	0.03	0.01	0.12	15.7	6/7/2019 8:35	6/8/2019 0:30	16.0	0.18	0.21	10,332
6/19/2019 18:35	6/20/2019 2:55	8.3	0.70	0.08	0.72	313.7	6/19/2019 18:30	6/20/2019 14:55	20.5	0.87	1.73	64,050
6/23/2019 6:35	6/23/2019 8:30	1.9	0.04	0.02	0.12	77.1	6/23/2019 6:30	6/23/2019 20:25	14.0	0.26	0.28	13,032
6/23/2019 23:15	6/24/2019 2:45	3.5	0.04	0.01	0.12	16.7	6/23/2019 23:10	6/24/2019 14:45	15.7	0.26	0.28	14,868
6/27/2019 2:20	6/27/2019 6:55	4.6	0.04	0.01	0.12	75.1	6/27/2019 2:15	6/27/2019 18:55	16.8	0.20	0.24	12,285
7/2/2019 12:55	7/2/2019 21:15	8.3	0.13	0.02	0.12	130.6	7/2/2019 12:55	7/3/2019 4:15	15.4	0.21	0.24	11,673
7/3/2019 4:15	7/3/2019 9:50	5.6	0.13	0.02	0.12	9.1	7/3/2019 4:15	7/3/2019 21:45	17.6	0.30	0.46	19,167
7/9/2019 21:05	7/10/2019 15:00	17.9	0.25	0.01	0.12	157.4	7/9/2019 21:00	7/11/2019 6:30	33.6	0.25	0.32	30,282
7/16/2019 1:45	7/16/2019 7:10	5.4	0.52	0.10	1.20	132.0	7/16/2019 1:40	7/16/2019 19:05	17.5	0.65	1.28	40,731
7/17/2019 5:30	7/17/2019 7:55	2.4	0.09	0.04	0.12	26.2	7/17/2019 5:30	7/17/2019 19:50	14.4	0.33	0.41	17,355
7/17/2019 21:40	7/18/2019 7:30	9.8	0.28	0.03	0.48	15.0	7/17/2019 21:40	7/18/2019 19:10	21.6	0.61	1.00	47,172
7/18/2019 19:10	7/19/2019 4:35	9.4	0.25	0.03	0.12	17.1	7/18/2019 19:10	7/19/2019 16:30	21.4	0.62	1.09	47,499
8/2/2019 2:55	8/2/2019 4:40	1.8	0.33	0.19	0.96	340.0	8/2/2019 2:55	8/2/2019 16:40	13.8	0.52	0.77	25,779
8/10/2019 3:35	8/10/2019 8:25	4.8	0.71	0.15	0.72	191.7	8/10/2019 3:30	8/10/2019 20:25	17.0	1.09	2.26	66,963
8/11/2019 6:50	8/11/2019 11:55	5.1	0.05	0.01	0.12	22.8	8/11/2019 6:45	8/11/2019 23:55	17.3	0.48	0.57	29,532
8/21/2019 5:20	8/21/2019 8:30	3.2	0.09	0.03	0.24	238.2	8/21/2019 5:15	8/21/2019 17:35	12.4	0.20	0.24	8,766
8/21/2019 17:40	8/21/2019 21:55	4.3	0.06	0.01	0.12	10.1	8/21/2019 17:35	8/22/2019 9:55	16.4	0.19	0.21	11,520
8/29/2019 18:05	8/29/2019 23:30	5.4	0.18	0.03	0.36	189.9	8/29/2019 18:00	8/30/2019 11:25	17.5	0.25	0.32	15,579
9/7/2019 19:30	9/7/2019 21:35	2.1	0.72	0.35	0.96	215.8	9/7/2019 19:30	9/8/2019 5:30	10.1	1.24	2.12	45,084
9/8/2019 5:30	9/8/2019 9:25	3.9	0.09	0.02	0.12	8.3	9/8/2019 5:30	9/8/2019 14:55	9.5	0.84	0.92	28,605
9/8/2019 14:55	9/8/2019 21:00	6.1	0.48	0.08	2.64	8.2	9/8/2019 14:55	9/9/2019 1:50	11.0	1.76	3.59	69,621
9/9/2019 1:50	9/9/2019 21:45	19.9	2.20	0.11	2.40	10.7	9/9/2019 1:50	9/10/2019 9:40	31.9	5.09	13.83	585,024
9/12/2019 19:50	9/12/2019 22:10	2.3	0.21	0.09	0.48	73.9	9/12/2019 19:50	9/13/2019 10:05	14.3	1.12	1.39	57,612
9/14/2019 20:20	9/15/2019 14:20	18.0	0.68	0.04	0.24	46.4	9/14/2019 20:15	9/16/2019 2:15	30.1	1.55	2.26	167,391
9/16/2019 17:30	9/16/2019 19:20	1.8	0.04	0.02	0.36	30.7	9/16/2019 17:25	9/17/2019 7:05	13.8	0.69	0.77	33,999
9/17/2019 7:05	9/18/2019 10:50	27.8	0.63	0.02	0.72	13.6	9/17/2019 7:05	9/18/2019 22:50	39.8	1.36	1.98	195,343
9/22/2019 5:35	9/23/2019 0:05	18.5	0.54	0.03	0.24	90.9	9/22/2019 5:35	9/23/2019 11:00	29.5	1.05	1.85	111,279
9/23/2019 11:00	9/23/2019 14:30	3.5	0.10	0.03	0.12	11.8	9/23/2019 11:00	9/24/2019 1:15	14.3	1.02	1.18	52,725
9/24/2019 1:15	9/24/2019 9:40	8.4	0.10	0.01	0.12	11.6	9/24/2019 1:15	9/24/2019 21:40	20.5	0.82	0.92	60,864
9/26/2019 4:50	9/26/2019 8:25	3.6	0.17	0.05	0.12	44.8	9/26/2019 4:50	9/26/2019 20:25	15.7	0.75	1.00	42,162
9/27/2019 1:00	9/27/2019 4:10	3.2	0.09	0.03	0.12	17.8	9/27/2019 0:55	9/27/2019 10:25	9.6	0.61	0.70	21,111
9/27/2019 10:25	9/28/2019 0:00	13.6	0.23	0.02	0.72	7.2	9/27/2019 10:25	9/28/2019 11:55	25.6	0.93	1.39	85,776
9/29/2019 1:20	9/29/2019 3:55	2.6	0.08	0.03	0.24	30.9	9/29/2019 1:15	9/29/2019 15:55	14.8	0.60	0.70	32,103

Table D-4. Summary Statistics for Individual Storm Events at the MONMN Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
10/1/2018 8:00	10/1/2018 19:45	11.8	0.38	0.03	0.24	33.2	10/1/2018 8:00	10/2/2018 7:40	23.8	0.05	0.09	4,599
10/5/2018 8:50	10/5/2018 19:25	10.6	0.50	0.05	0.24	86.2	10/5/2018 8:50	10/6/2018 7:25	22.7	0.10	0.18	8,304
10/8/2018 3:05	10/8/2018 5:35	2.5	0.03	0.01	0.12	57.2	10/8/2018 3:00	10/8/2018 10:15	7.3	0.03	0.03	792
10/8/2018 10:20	10/9/2018 7:25	21.1	0.86	0.04	0.36	64.4	10/8/2018 10:15	10/9/2018 19:25	33.3	0.26	0.46	31,623
10/25/2018 7:20	10/26/2018 8:50	25.5	0.78	0.03	0.36	385.1	10/25/2018 7:15	10/26/2018 20:45	37.6	0.23	0.53	30,840
10/27/2018 15:00	10/28/2018 10:50	19.8	1.22	0.06	0.48	34.2	10/27/2018 14:55	10/28/2018 16:50	26.0	1.10	2.17	103,320
10/28/2018 16:55	10/28/2018 21:45	4.8	0.05	0.01	0.12	10.8	10/28/2018 16:50	10/29/2018 9:40	16.9	0.59	0.79	35,760
10/29/2018 13:50	10/29/2018 14:10	0.3	0.05	0.15	0.12	20.5	10/29/2018 13:50	10/30/2018 2:10	12.4	0.29	0.34	12,930
10/30/2018 20:05	10/31/2018 2:20	6.3	0.17	0.03	0.12	30.2	10/30/2018 20:00	10/31/2018 14:15	18.3	0.22	0.29	14,283
10/31/2018 16:05	10/31/2018 22:05	6.0	0.03	0.01	0.12	18.1	10/31/2018 16:05	11/1/2018 1:25	9.4	0.12	0.13	4,089
11/1/2018 1:30	11/1/2018 10:15	8.8	0.20	0.02	0.12	27.5	11/1/2018 1:25	11/1/2018 22:15	20.9	0.28	0.46	20,949
11/1/2018 23:30	11/2/2018 17:20	17.8	0.66	0.04	0.48	14.3	11/1/2018 23:25	11/3/2018 5:20	30.0	0.73	1.61	78,363
11/3/2018 8:55	11/3/2018 18:55	10.0	0.22	0.02	0.12	20.0	11/3/2018 8:55	11/4/2018 4:30	19.7	0.51	0.61	36,045
11/4/2018 4:35	11/4/2018 6:00	1.4	0.06	0.04	0.12	14.3	11/4/2018 4:30	11/4/2018 16:15	11.8	0.34	0.40	14,421
11/4/2018 16:15	11/4/2018 18:30	2.3	0.12	0.05	0.84	11.5	11/4/2018 16:15	11/5/2018 6:30	14.3	0.22	0.29	11,385
11/5/2018 18:00	11/5/2018 23:55	5.9	0.03	0.01	0.12	25.7	11/5/2018 17:55	11/6/2018 11:55	18.1	0.22	0.25	14,049
11/9/2018 9:50	11/9/2018 12:50	3.0	0.07	0.02	0.12	113.5	11/9/2018 9:45	11/10/2018 0:45	15.1	0.04	0.05	2,259
11/14/2018 5:25	11/14/2018 8:35	3.2	0.08	0.03	0.12	114.4	11/14/2018 5:25	11/14/2018 20:35	15.3	0.04	0.06	2,448
11/15/2018 23:45	11/16/2018 6:05	6.3	0.12	0.02	0.12	39.9	11/15/2018 23:45	11/16/2018 18:05	18.4	0.08	0.11	5,418
11/21/2018 21:45	11/22/2018 6:30	8.8	0.13	0.01	0.12	139.2	11/21/2018 21:40	11/22/2018 13:50	16.3	0.06	0.07	3,468
11/22/2018 13:50	11/23/2018 19:40	29.8	1.07	0.04	0.48	9.8	11/22/2018 13:50	11/24/2018 7:40	41.9	0.90	1.30	136,287
11/26/2018 4:10	11/27/2018 6:15	26.1	1.50	0.06	0.24	61.3	11/26/2018 4:05	11/27/2018 14:55	34.9	1.26	2.27	159,003
11/27/2018 14:55	11/27/2018 20:20	5.4	0.39	0.07	0.72	9.0	11/27/2018 14:55	11/28/2018 3:55	13.1	1.31	1.53	61,530
11/28/2018 4:00	11/28/2018 11:20	7.3	0.22	0.03	0.36	8.5	11/28/2018 3:55	11/28/2018 14:15	10.4	1.18	1.30	44,178
11/28/2018 14:20	11/28/2018 17:40	3.3	0.06	0.02	0.12	8.6	11/28/2018 14:15	11/29/2018 5:35	15.4	0.87	1.02	48,447
11/30/2018 19:20	11/30/2018 21:55	2.6	0.20	0.08	0.24	52.3	11/30/2018 19:15	12/1/2018 8:15	13.1	0.49	0.61	22,908
12/1/2018 8:20	12/1/2018 12:25	4.1	0.03	0.01	0.12	10.9	12/1/2018 8:15	12/2/2018 0:20	16.2	0.33	0.46	19,233
12/9/2018 9:30	12/10/2018 2:20	16.8	0.66	0.04	0.12	204.1	12/9/2018 9:30	12/10/2018 14:20	28.9	0.49	0.79	50,751
12/11/2018 3:35	12/11/2018 22:35	19.0	0.61	0.03	0.96	31.8	12/11/2018 3:30	12/12/2018 10:30	31.1	0.68	1.15	75,720
12/12/2018 20:50	12/13/2018 6:55	10.1	0.08	0.01	0.12	24.1	12/12/2018 20:50	12/13/2018 10:50	14.1	0.49	0.53	24,669
12/13/2018 10:55	12/13/2018 16:05	5.2	0.03	0.01	0.12	13.4	12/13/2018 10:50	12/14/2018 4:05	17.3	0.36	0.40	22,509
12/15/2018 22:55	12/16/2018 6:25	7.5	0.31	0.04	0.12	73.4	12/15/2018 22:50	12/16/2018 14:15	15.5	0.46	0.69	25,467
12/16/2018 14:20	12/16/2018 21:45	7.4	0.21	0.03	0.36	10.1	12/16/2018 14:15	12/17/2018 5:25	15.3	0.59	0.69	32,505
12/17/2018 5:30	12/17/2018 6:10	0.7	0.03	0.05	0.12	8.0	12/17/2018 5:25	12/17/2018 17:15	11.9	0.46	0.53	19,869
12/17/2018 17:20	12/18/2018 8:05	14.8	0.53	0.04	0.24	19.8	12/17/2018 17:15	12/18/2018 13:30	20.3	0.84	1.30	61,161
12/18/2018 13:35	12/18/2018 18:20	4.8	0.32	0.07	0.48	7.2	12/18/2018 13:30	12/19/2018 6:20	16.9	1.23	1.61	74,610
12/20/2018 1:55	12/20/2018 10:50	8.9	0.21	0.02	0.24	31.9	12/20/2018 1:50	12/20/2018 22:50	21.1	0.64	0.79	48,729
12/22/2018 17:50	12/23/2018 13:25	19.6	0.78	0.04	0.36	55.4	12/22/2018 17:45	12/24/2018 1:25	31.8	0.95	1.79	108,543
12/26/2018 9:25	12/26/2018 11:45	2.3	0.05	0.02	0.12	72.7	12/26/2018 9:20	12/26/2018 23:45	14.5	0.23	0.25	12,126
12/27/2018 2:35	12/27/2018 3:05	0.5	0.05	0.10	0.36	16.2	12/27/2018 2:35	12/27/2018 15:00	12.5	0.20	0.21	9,126
12/28/2018 5:05	12/28/2018 21:35	16.5	0.72	0.04	0.24	26.1	12/28/2018 5:00	12/29/2018 9:30	28.6	0.89	1.53	91,146
12/29/2018 13:05	12/30/2018 3:00	13.9	1.02	0.07	0.60	16.6	12/29/2018 13:05	12/30/2018 15:00	26.0	2.09	3.34	196,005
1/2/2019 23:55	1/4/2019 7:00	31.1	1.07	0.03	0.36	93.6	1/2/2019 23:55	1/4/2019 15:20	39.5	1.33	2.84	189,646
1/4/2019 15:25	1/4/2019 18:50	3.4	0.03	0.01	0.12	10.8	1/4/2019 15:20	1/5/2019 6:50	15.6	1.25	1.45	70,173
1/5/2019 21:55	1/6/2019 3:05	5.2	0.19	0.04	0.24	41.3	1/5/2019 21:55	1/6/2019 15:00	17.2	0.84	1.02	51,780

Table D-4. Summary Statistics for Individual Storm Events at the MONMN Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
1/6/2019 17:20	1/7/2019 0:05	6.8	0.47	0.07	0.24	15.2	1/6/2019 17:15	1/7/2019 12:00	18.8	1.37	1.88	92,817
1/8/2019 8:45	1/10/2019 10:00	49.3	0.57	0.01	0.24	34.8	1/8/2019 8:45	1/10/2019 10:35	49.9	0.79	1.02	142,410
1/10/2019 10:35	1/10/2019 13:35	3.0	0.04	0.01	0.12	6.3	1/10/2019 10:35	1/11/2019 1:30	15.0	0.83	0.90	44,622
1/17/2019 2:15	1/17/2019 3:20	1.1	0.08	0.07	0.12	159.7	1/17/2019 2:10	1/17/2019 15:20	13.3	0.17	0.21	8,052
1/18/2019 18:45	1/19/2019 2:25	7.7	0.16	0.02	0.24	39.8	1/18/2019 18:40	1/19/2019 14:25	19.8	0.25	0.36	17,715
1/22/2019 13:45	1/23/2019 9:45	20.0	0.85	0.04	0.24	88.3	1/22/2019 13:40	1/23/2019 21:40	32.1	0.71	1.01	81,834
2/1/2019 4:40	2/1/2019 21:45	17.1	0.64	0.04	0.12	212.8	2/1/2019 4:40	2/2/2019 9:40	29.1	0.49	0.69	50,859
2/5/2019 11:55	2/5/2019 14:40	2.8	0.18	0.07	0.36	89.2	2/5/2019 11:55	2/6/2019 2:40	14.8	0.20	0.22	10,479
2/9/2019 13:55	2/9/2019 17:00	3.1	0.17	0.06	0.12	97.2	2/9/2019 13:50	2/10/2019 5:00	15.3	0.14	0.15	7,632
2/11/2019 12:00	2/11/2019 16:10	4.2	0.11	0.03	0.12	44.2	2/11/2019 11:55	2/12/2019 4:05	16.3	0.15	0.18	8,874
2/12/2019 11:35	2/13/2019 13:45	26.2	0.98	0.04	0.12	21.8	2/12/2019 11:35	2/14/2019 1:40	38.2	0.43	0.56	58,437
2/14/2019 8:55	2/14/2019 20:25	11.5	0.25	0.02	0.24	19.5	2/14/2019 8:55	2/15/2019 8:25	23.6	0.70	1.01	59,196
2/16/2019 8:00	2/16/2019 22:20	14.3	0.45	0.03	0.12	36.6	2/16/2019 8:00	2/17/2019 10:20	26.4	1.32	2.04	125,526
2/19/2019 13:35	2/20/2019 3:25	13.8	0.31	0.02	0.12	64.8	2/19/2019 13:30	2/20/2019 15:20	25.9	1.03	1.32	96,162
2/22/2019 8:35	2/22/2019 16:40	8.1	0.22	0.03	0.24	55.8	2/22/2019 8:35	2/23/2019 4:40	20.2	0.71	0.92	51,402
2/23/2019 13:55	2/23/2019 23:25	9.5	0.23	0.02	0.48	23.6	2/23/2019 13:50	2/24/2019 11:25	21.7	0.76	0.92	59,529
3/6/2019 13:20	3/6/2019 19:20	6.0	0.10	0.02	0.12	256.8	3/6/2019 13:15	3/7/2019 7:20	18.2	0.10	0.12	6,630
3/7/2019 9:15	3/7/2019 11:10	1.9	0.21	0.11	0.24	16.2	3/7/2019 9:10	3/7/2019 23:10	14.1	0.26	0.36	13,242
3/8/2019 8:25	3/8/2019 10:20	1.9	0.13	0.07	0.24	21.4	3/8/2019 8:25	3/8/2019 22:20	14.0	0.27	0.36	13,479
3/11/2019 17:40	3/12/2019 20:35	26.9	1.28	0.05	0.36	79.5	3/11/2019 17:35	3/13/2019 8:35	39.1	1.26	2.31	177,087
3/25/2019 17:15	3/26/2019 4:25	11.2	0.25	0.02	0.24	309.0	3/25/2019 17:10	3/26/2019 16:25	23.3	0.16	0.32	13,821
4/3/2019 3:40	4/3/2019 9:40	6.0	0.10	0.02	0.24	194.5	4/3/2019 3:40	4/3/2019 21:40	18.1	0.05	0.06	3,333
4/4/2019 21:35	4/5/2019 4:30	6.9	0.18	0.03	0.12	37.0	4/4/2019 21:30	4/5/2019 11:45	14.3	0.09	0.15	4,896
4/5/2019 11:45	4/5/2019 18:15	6.5	0.32	0.05	0.60	8.1	4/5/2019 11:45	4/6/2019 6:10	18.5	0.36	0.56	24,267
4/6/2019 6:10	4/6/2019 13:00	6.8	0.16	0.02	0.24	14.9	4/6/2019 6:10	4/6/2019 22:05	16.0	0.28	0.36	16,182
4/6/2019 22:05	4/7/2019 4:25	6.3	0.32	0.05	0.12	9.2	4/6/2019 22:05	4/7/2019 16:25	18.4	0.47	0.69	31,077
4/8/2019 17:20	4/9/2019 12:00	18.7	0.32	0.02	0.36	37.8	4/8/2019 17:15	4/10/2019 0:00	30.8	0.31	0.51	34,098
4/10/2019 10:35	4/11/2019 6:50	20.3	0.34	0.02	0.24	23.4	4/10/2019 10:30	4/11/2019 11:55	25.5	0.34	0.56	30,843
4/11/2019 12:00	4/11/2019 14:25	2.4	0.04	0.02	0.12	7.2	4/11/2019 11:55	4/11/2019 20:00	8.2	0.41	0.45	12,114
4/11/2019 20:00	4/12/2019 5:40	9.7	0.34	0.04	0.24	8.0	4/11/2019 20:00	4/12/2019 17:35	21.7	0.75	1.21	58,728
4/13/2019 5:45	4/13/2019 15:20	9.6	0.25	0.03	0.12	28.1	4/13/2019 5:45	4/14/2019 3:20	21.7	0.56	0.76	43,773
4/16/2019 17:05	4/16/2019 19:20	2.3	0.10	0.04	0.12	78.3	4/16/2019 17:00	4/17/2019 7:15	14.3	0.19	0.25	9,984
4/18/2019 5:50	4/18/2019 7:20	1.5	0.10	0.07	0.24	35.2	4/18/2019 5:50	4/18/2019 18:40	12.9	0.20	0.25	9,114
4/18/2019 18:45	4/18/2019 19:50	1.1	0.07	0.06	0.12	12.1	4/18/2019 18:40	4/19/2019 4:05	9.5	0.22	0.25	7,488
4/19/2019 4:05	4/19/2019 16:00	11.9	0.13	0.01	0.12	8.8	4/19/2019 4:05	4/20/2019 3:55	23.9	0.30	0.45	25,845
4/22/2019 10:50	4/22/2019 17:45	6.9	0.26	0.04	0.12	68.8	4/22/2019 10:50	4/23/2019 5:45	19.0	0.30	0.51	20,532
5/14/2019 8:30	5/14/2019 12:30	4.0	0.05	0.01	0.12	519.6	5/14/2019 8:30	5/15/2019 0:30	16.1	0.03	0.05	1,803
5/15/2019 16:40	5/15/2019 19:30	2.8	0.06	0.02	0.12	31.7	5/15/2019 16:40	5/16/2019 7:30	14.9	0.04	0.05	2,133
5/16/2019 10:50	5/17/2019 6:25	19.6	0.83	0.04	0.24	17.1	5/16/2019 10:50	5/17/2019 18:20	31.6	0.48	1.11	54,183
5/20/2019 9:30	5/20/2019 22:40	13.2	0.31	0.02	0.12	77.2	5/20/2019 9:30	5/21/2019 10:40	25.3	0.34	0.51	30,951
5/24/2019 8:55	5/24/2019 10:20	1.4	0.03	0.02	0.12	83.7	5/24/2019 8:55	5/24/2019 22:15	13.4	0.06	0.06	2,883
5/25/2019 12:00	5/25/2019 16:25	4.4	0.16	0.04	0.12	110.8	5/25/2019 12:00	5/26/2019 4:25	16.5	0.14	0.22	8,199
6/6/2019 14:20	6/6/2019 18:10	3.8	0.08	0.02	0.36	286.8	6/6/2019 14:15	6/7/2019 6:10	16.0	0.04	0.05	2,568
6/7/2019 8:35	6/7/2019 12:30	3.9	0.03	0.01	0.12	15.7	6/7/2019 8:35	6/8/2019 0:30	16.0	0.04	0.05	2,472
6/19/2019 18:35	6/20/2019 2:55	8.3	0.70	0.08	0.72	313.7	6/19/2019 18:30	6/20/2019 14:55	20.5	0.19	0.32	13,875

Table D-4. Summary Statistics for Individual Storm Events at the MONMN Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
6/23/2019 6:35	6/23/2019 8:30	1.9	0.04	0.02	0.12	77.1	6/23/2019 6:30	6/23/2019 20:25	14.0	0.07	0.07	3,525
6/23/2019 23:15	6/24/2019 2:45	3.5	0.04	0.01	0.12	16.7	6/23/2019 23:10	6/24/2019 14:45	15.7	0.07	0.07	3,855
6/27/2019 2:20	6/27/2019 6:55	4.6	0.04	0.01	0.12	75.1	6/27/2019 2:15	6/27/2019 18:55	16.8	0.05	0.06	3,018
7/2/2019 12:55	7/2/2019 21:15	8.3	0.13	0.02	0.12	130.6	7/2/2019 12:55	7/3/2019 4:15	15.4	0.05	0.06	2,604
7/3/2019 4:15	7/3/2019 9:50	5.6	0.13	0.02	0.12	9.1	7/3/2019 4:15	7/3/2019 21:45	17.6	0.05	0.06	3,459
7/9/2019 21:05	7/10/2019 15:00	17.9	0.25	0.01	0.12	157.4	7/9/2019 21:00	7/11/2019 6:30	33.6	0.05	0.05	5,877
7/16/2019 1:45	7/16/2019 7:10	5.4	0.52	0.10	1.20	132.0	7/16/2019 1:40	7/16/2019 19:05	17.5	0.06	0.09	3,861
7/17/2019 5:30	7/17/2019 7:55	2.4	0.09	0.04	0.12	26.2	7/17/2019 5:30	7/17/2019 19:50	14.4	0.05	0.05	2,595
7/17/2019 21:40	7/18/2019 7:30	9.8	0.28	0.03	0.48	15.0	7/17/2019 21:40	7/18/2019 19:10	21.6	0.06	0.07	4,830
7/18/2019 19:10	7/19/2019 4:35	9.4	0.25	0.03	0.12	17.1	7/18/2019 19:10	7/19/2019 16:30	21.4	0.07	0.09	5,718
8/2/2019 2:55	8/2/2019 4:40	1.8	0.33	0.19	0.96	340.0	8/2/2019 2:55	8/2/2019 16:40	13.8	0.06	0.07	2,805
8/10/2019 3:35	8/10/2019 8:25	4.8	0.71	0.15	0.72	191.7	8/10/2019 3:30	8/10/2019 20:25	17.0	0.13	0.28	8,109
8/11/2019 6:50	8/11/2019 11:55	5.1	0.05	0.01	0.12	22.8	8/11/2019 6:45	8/11/2019 23:55	17.3	0.11	0.15	6,606
8/21/2019 5:20	8/21/2019 8:30	3.2	0.09	0.03	0.24	238.2	8/21/2019 5:15	8/21/2019 17:35	12.4	0.03	0.03	1,275
8/21/2019 17:40	8/21/2019 21:55	4.3	0.06	0.01	0.12	10.1	8/21/2019 17:35	8/22/2019 9:55	16.4	0.03	0.03	1,773
8/29/2019 18:05	8/29/2019 23:30	5.4	0.18	0.03	0.36	189.9	8/29/2019 18:00	8/30/2019 11:25	17.5	0.03	0.03	1,890
9/7/2019 19:30	9/7/2019 21:35	2.1	0.72	0.35	0.96	215.8	9/7/2019 19:30	9/8/2019 5:30	10.1	0.16	0.28	5,646
9/8/2019 5:30	9/8/2019 9:25	3.9	0.09	0.02	0.12	8.3	9/8/2019 5:30	9/8/2019 14:55	9.5	0.14	0.25	4,947
9/8/2019 14:55	9/8/2019 21:00	6.1	0.48	0.08	2.64	8.2	9/8/2019 14:55	9/9/2019 1:50	11.0	0.34	0.62	13,422
9/9/2019 1:50	9/9/2019 21:45	19.9	2.20	0.11	2.40	10.7	9/9/2019 1:50	9/10/2019 9:40	31.9	1.83	6.25	209,688
9/12/2019 19:50	9/12/2019 22:10	2.3	0.21	0.09	0.48	73.9	9/12/2019 19:50	9/13/2019 10:05	14.3	0.31	0.32	15,924
9/14/2019 20:20	9/15/2019 14:20	18.0	0.68	0.04	0.24	46.4	9/14/2019 20:15	9/16/2019 2:15	30.1	0.42	0.56	45,738
9/16/2019 17:30	9/16/2019 19:20	1.8	0.04	0.02	0.36	30.7	9/16/2019 17:25	9/17/2019 7:05	13.8	0.23	0.25	11,484
9/17/2019 7:05	9/18/2019 10:50	27.8	0.63	0.02	0.72	13.6	9/17/2019 7:05	9/18/2019 22:50	39.8	0.37	0.51	53,739
9/22/2019 5:35	9/23/2019 0:05	18.5	0.54	0.03	0.24	90.9	9/22/2019 5:35	9/23/2019 11:00	29.5	0.25	0.45	26,754
9/23/2019 11:00	9/23/2019 14:30	3.5	0.10	0.03	0.12	11.8	9/23/2019 11:00	9/24/2019 1:15	14.3	0.29	0.32	14,886
9/24/2019 1:15	9/24/2019 9:40	8.4	0.10	0.01	0.12	11.6	9/24/2019 1:15	9/24/2019 21:40	20.5	0.24	0.28	17,793
9/26/2019 4:50	9/26/2019 8:25	3.6	0.17	0.05	0.12	44.8	9/26/2019 4:50	9/26/2019 20:25	15.7	0.19	0.28	10,773
9/27/2019 1:00	9/27/2019 4:10	3.2	0.09	0.03	0.12	17.8	9/27/2019 0:55	9/27/2019 10:25	9.6	0.12	0.15	4,266
9/27/2019 10:25	9/28/2019 0:00	13.6	0.23	0.02	0.72	7.2	9/27/2019 10:25	9/28/2019 11:55	25.6	0.28	0.41	25,473
9/29/2019 1:20	9/29/2019 3:55	2.6	0.08	0.03	0.24	30.9	9/29/2019 1:15	9/29/2019 15:55	14.8	0.18	0.25	9,453

Table D-5. Summary Statistics for Individual Storm Events at the MONMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
10/1/2018 8:00	10/1/2018 19:45	11.8	0.38	0.03	0.24	33.2	10/1/2018 8:00	10/2/2018 7:40	23.8	0.08	0.29	6,807
10/5/2018 8:50	10/5/2018 19:25	10.6	0.50	0.05	0.24	86.2	10/5/2018 8:50	10/6/2018 7:25	22.7	0.12	0.27	9,747
10/8/2018 3:05	10/8/2018 5:35	2.5	0.03	0.01	0.12	57.2	10/8/2018 3:00	10/8/2018 10:15	7.3	0.04	0.05	1,080
10/8/2018 10:20	10/9/2018 7:25	21.1	0.86	0.04	0.36	64.4	10/8/2018 10:15	10/9/2018 19:25	33.3	0.19	0.42	22,482
10/25/2018 7:20	10/26/2018 8:50	25.5	0.78	0.03	0.36	385.1	10/25/2018 7:15	10/26/2018 20:45	37.6	0.12	0.42	16,761
10/27/2018 15:00	10/28/2018 10:50	19.8	1.22	0.06	0.48	34.2	10/27/2018 14:55	10/28/2018 16:50	26.0	0.37	0.87	34,722
10/28/2018 16:55	10/28/2018 21:45	4.8	0.05	0.01	0.12	10.8	10/28/2018 16:50	10/29/2018 9:40	16.9	0.18	0.22	11,007
10/29/2018 13:50	10/29/2018 14:10	0.3	0.05	0.15	0.12	20.5	10/29/2018 13:50	10/30/2018 2:10	12.4	0.13	0.16	5,823
10/30/2018 20:05	10/31/2018 2:20	6.3	0.17	0.03	0.12	30.2	10/30/2018 20:00	10/31/2018 14:15	18.3	0.12	0.24	8,112
10/31/2018 16:05	10/31/2018 22:05	6.0	0.03	0.01	0.12	18.1	10/31/2018 16:05	11/1/2018 1:25	9.4	0.09	0.10	3,141
11/1/2018 1:30	11/1/2018 10:15	8.8	0.20	0.02	0.12	27.5	11/1/2018 1:25	11/1/2018 22:15	20.9	0.12	0.22	9,402
11/1/2018 23:30	11/2/2018 17:20	17.8	0.66	0.04	0.48	14.3	11/1/2018 23:25	11/3/2018 5:20	30.0	0.24	0.65	25,938
11/3/2018 8:55	11/3/2018 18:55	10.0	0.22	0.02	0.12	20.0	11/3/2018 8:55	11/4/2018 4:30	19.7	0.19	0.31	13,698
11/4/2018 4:35	11/4/2018 6:00	1.4	0.06	0.04	0.12	14.3	11/4/2018 4:30	11/4/2018 16:15	11.8	0.16	0.21	6,717
11/4/2018 16:15	11/4/2018 18:30	2.3	0.12	0.05	0.84	11.5	11/4/2018 16:15	11/5/2018 6:30	14.3	0.18	0.31	9,474
11/5/2018 18:00	11/5/2018 23:55	5.9	0.03	0.01	0.12	25.7	11/5/2018 17:55	11/6/2018 11:55	18.1	0.11	0.12	7,359
11/9/2018 9:50	11/9/2018 12:50	3.0	0.07	0.02	0.12	113.5	11/9/2018 9:45	11/10/2018 0:45	15.1	0.07	0.09	3,873
11/14/2018 5:25	11/14/2018 8:35	3.2	0.08	0.03	0.12	114.4	11/14/2018 5:25	11/14/2018 20:35	15.3	0.06	0.09	3,333
11/15/2018 23:45	11/16/2018 6:05	6.3	0.12	0.02	0.12	39.9	11/15/2018 23:45	11/16/2018 18:05	18.4	0.07	0.11	4,611
11/21/2018 21:45	11/22/2018 6:30	8.8	0.13	0.01	0.12	139.2	11/21/2018 21:40	11/22/2018 13:50	16.3	0.06	0.09	3,747
11/22/2018 13:50	11/23/2018 19:40	29.8	1.07	0.04	0.48	9.8	11/22/2018 13:50	11/24/2018 7:40	41.9	0.25	0.54	37,347
11/26/2018 4:10	11/27/2018 6:15	26.1	1.50	0.06	0.24	61.3	11/26/2018 4:05	11/27/2018 14:55	34.9	0.49	1.01	61,326
11/27/2018 14:55	11/27/2018 20:20	5.4	0.39	0.07	0.72	9.0	11/27/2018 14:55	11/28/2018 3:55	13.1	0.50	0.74	23,322
11/28/2018 4:00	11/28/2018 11:20	7.3	0.22	0.03	0.36	8.5	11/28/2018 3:55	11/28/2018 14:15	10.4	0.45	0.65	16,689
11/28/2018 14:20	11/28/2018 17:40	3.3	0.06	0.02	0.12	8.6	11/28/2018 14:15	11/29/2018 5:35	15.4	0.29	0.35	15,957
11/30/2018 19:20	11/30/2018 21:55	2.6	0.20	0.08	0.24	52.3	11/30/2018 19:15	12/1/2018 8:15	13.1	0.20	0.35	9,267
12/1/2018 8:20	12/1/2018 12:25	4.1	0.03	0.01	0.12	10.9	12/1/2018 8:15	12/2/2018 0:20	16.2	0.14	0.16	8,406
12/9/2018 9:30	12/10/2018 2:20	16.8	0.66	0.04	0.12	204.1	12/9/2018 9:30	12/10/2018 14:20	28.9	0.21	0.35	21,495
12/11/2018 3:35	12/11/2018 22:35	19.0	0.61	0.03	0.96	31.8	12/11/2018 3:30	12/12/2018 10:30	31.1	0.26	0.49	28,599
12/12/2018 20:50	12/13/2018 6:55	10.1	0.08	0.01	0.12	24.1	12/12/2018 20:50	12/13/2018 10:50	14.1	0.16	0.19	8,208
12/13/2018 10:55	12/13/2018 16:05	5.2	0.03	0.01	0.12	13.4	12/13/2018 10:50	12/14/2018 4:05	17.3	0.15	0.16	9,102
12/15/2018 22:55	12/16/2018 6:25	7.5	0.31	0.04	0.12	73.4	12/15/2018 22:50	12/16/2018 14:15	15.5	0.19	0.33	10,461
12/16/2018 14:20	12/16/2018 21:45	7.4	0.21	0.03	0.36	10.1	12/16/2018 14:15	12/17/2018 5:25	15.3	0.21	0.29	11,346
12/17/2018 5:30	12/17/2018 6:10	0.7	0.03	0.05	0.12	8.0	12/17/2018 5:25	12/17/2018 17:15	11.9	0.16	0.18	6,897
12/17/2018 17:20	12/18/2018 8:05	14.8	0.53	0.04	0.24	19.8	12/17/2018 17:15	12/18/2018 13:30	20.3	0.32	0.54	23,634
12/18/2018 13:35	12/18/2018 18:20	4.8	0.32	0.07	0.48	7.2	12/18/2018 13:30	12/19/2018 6:20	16.9	0.36	0.60	21,771
12/20/2018 1:55	12/20/2018 10:50	8.9	0.21	0.02	0.24	31.9	12/20/2018 1:50	12/20/2018 22:50	21.1	0.21	0.33	16,068
12/22/2018 17:50	12/23/2018 13:25	19.6	0.78	0.04	0.36	55.4	12/22/2018 17:45	12/24/2018 1:25	31.8	0.30	0.71	34,431
12/26/2018 9:25	12/26/2018 11:45	2.3	0.05	0.02	0.12	72.7	12/26/2018 9:20	12/26/2018 23:45	14.5	0.10	0.11	5,076
12/27/2018 2:35	12/27/2018 3:05	0.5	0.05	0.10	0.36	16.2	12/27/2018 2:35	12/27/2018 15:00	12.5	0.10	0.12	4,314
12/28/2018 5:05	12/28/2018 21:35	16.5	0.72	0.04	0.24	26.1	12/28/2018 5:00	12/29/2018 9:30	28.6	0.29	0.57	29,775
12/29/2018 13:05	12/30/2018 3:00	13.9	1.02	0.07	0.60	16.6	12/29/2018 13:05	12/30/2018 15:00	26.0	0.63	1.21	58,548
1/2/2019 23:55	1/4/2019 7:00	31.1	1.07	0.03	0.36	93.6	1/2/2019 23:55	1/4/2019 15:20	39.5	0.41	1.17	57,603
1/4/2019 15:25	1/4/2019 18:50	3.4	0.03	0.01	0.12	10.8	1/4/2019 15:20	1/5/2019 6:50	15.6	0.24	0.29	13,584

Table D-5. Summary Statistics for Individual Storm Events at the MONMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
1/5/2019 21:55	1/6/2019 3:05	5.2	0.19	0.04	0.24	41.3	1/5/2019 21:55	1/6/2019 15:00	17.2	0.22	0.31	13,743
1/6/2019 17:20	1/7/2019 0:05	6.8	0.47	0.07	0.24	15.2	1/6/2019 17:15	1/7/2019 12:00	18.8	0.38	0.71	25,896
1/8/2019 8:45	1/10/2019 10:00	49.3	0.57	0.01	0.24	34.8	1/8/2019 8:45	1/10/2019 10:35	49.9	0.22	0.31	38,700
1/10/2019 10:35	1/10/2019 13:35	3.0	0.04	0.01	0.12	6.3	1/10/2019 10:35	1/11/2019 1:30	15.0	0.20	0.26	10,680
1/17/2019 2:15	1/17/2019 3:20	1.1	0.08	0.07	0.12	159.7	1/17/2019 2:10	1/17/2019 15:20	13.3	0.10	0.16	4,971
1/18/2019 18:45	1/19/2019 2:25	7.7	0.16	0.02	0.24	39.8	1/18/2019 18:40	1/19/2019 14:25	19.8	0.13	0.23	9,615
1/22/2019 13:45	1/23/2019 9:45	20.0	0.85	0.04	0.24	88.3	1/22/2019 13:40	1/23/2019 21:40	32.1	0.31	0.53	36,357
2/1/2019 4:40	2/1/2019 21:45	17.1	0.64	0.04	0.12	212.8	2/1/2019 4:40	2/2/2019 9:40	29.1	0.24	0.39	25,440
2/5/2019 11:55	2/5/2019 14:40	2.8	0.18	0.07	0.36	89.2	2/5/2019 11:55	2/6/2019 2:40	14.8	0.10	0.11	5,310
2/9/2019 13:55	2/9/2019 17:00	3.1	0.17	0.06	0.12	97.2	2/9/2019 13:50	2/10/2019 5:00	15.3	0.09	0.10	5,178
2/11/2019 12:00	2/11/2019 16:10	4.2	0.11	0.03	0.12	44.2	2/11/2019 11:55	2/12/2019 4:05	16.3	0.10	0.10	5,556
2/12/2019 11:35	2/13/2019 13:45	26.2	0.98	0.04	0.12	21.8	2/12/2019 11:35	2/14/2019 1:40	38.2	0.17	0.23	23,313
2/14/2019 8:55	2/14/2019 20:25	11.5	0.25	0.02	0.24	19.5	2/14/2019 8:55	2/15/2019 8:25	23.6	0.25	0.37	21,555
2/16/2019 8:00	2/16/2019 22:20	14.3	0.45	0.03	0.12	36.6	2/16/2019 8:00	2/17/2019 10:20	26.4	0.42	0.67	39,618
2/19/2019 13:35	2/20/2019 3:25	13.8	0.31	0.02	0.12	64.8	2/19/2019 13:30	2/20/2019 15:20	25.9	0.38	0.53	35,367
2/22/2019 8:35	2/22/2019 16:40	8.1	0.22	0.03	0.24	55.8	2/22/2019 8:35	2/23/2019 4:40	20.2	0.26	0.41	18,903
2/23/2019 13:55	2/23/2019 23:25	9.5	0.23	0.02	0.48	23.6	2/23/2019 13:50	2/24/2019 11:25	21.7	0.33	0.48	25,533
3/6/2019 13:20	3/6/2019 19:20	6.0	0.10	0.02	0.12	256.8	3/6/2019 13:15	3/7/2019 7:20	18.2	0.14	0.17	9,378
3/7/2019 9:15	3/7/2019 11:10	1.9	0.21	0.11	0.24	16.2	3/7/2019 9:10	3/7/2019 23:10	14.1	0.18	0.25	9,354
3/8/2019 8:25	3/8/2019 10:20	1.9	0.13	0.07	0.24	21.4	3/8/2019 8:25	3/8/2019 22:20	14.0	0.18	0.27	9,018
3/11/2019 17:40	3/12/2019 20:35	26.9	1.28	0.05	0.36	79.5	3/11/2019 17:35	3/13/2019 8:35	39.1	0.51	1.19	71,901
3/25/2019 17:15	3/26/2019 4:25	11.2	0.25	0.02	0.24	309.0	3/25/2019 17:10	3/26/2019 16:25	23.3	0.10	0.21	8,796
4/3/2019 3:40	4/3/2019 9:40	6.0	0.10	0.02	0.24	194.5	4/3/2019 3:40	4/3/2019 21:40	18.1	0.06	0.08	3,750
4/4/2019 21:35	4/5/2019 4:30	6.9	0.18	0.03	0.12	37.0	4/4/2019 21:30	4/5/2019 11:45	14.3	0.08	0.15	4,098
4/5/2019 11:45	4/5/2019 18:15	6.5	0.32	0.05	0.60	8.1	4/5/2019 11:45	4/6/2019 6:10	18.5	0.13	0.27	8,382
4/6/2019 6:10	4/6/2019 13:00	6.8	0.16	0.02	0.24	14.9	4/6/2019 6:10	4/6/2019 22:05	16.0	0.11	0.15	6,489
4/6/2019 22:05	4/7/2019 4:25	6.3	0.32	0.05	0.12	9.2	4/6/2019 22:05	4/7/2019 16:25	18.4	0.18	0.30	11,922
4/8/2019 17:20	4/9/2019 12:00	18.7	0.32	0.02	0.36	37.8	4/8/2019 17:15	4/10/2019 0:00	30.8	0.13	0.23	14,619
4/10/2019 10:35	4/11/2019 6:50	20.3	0.34	0.02	0.24	23.4	4/10/2019 10:30	4/11/2019 11:55	25.5	0.15	0.25	13,545
4/11/2019 12:00	4/11/2019 14:25	2.4	0.04	0.02	0.12	7.2	4/11/2019 11:55	4/11/2019 20:00	8.2	0.16	0.18	4,557
4/11/2019 20:00	4/12/2019 5:40	9.7	0.34	0.04	0.24	8.0	4/11/2019 20:00	4/12/2019 17:35	21.7	0.23	0.41	17,868
4/13/2019 5:45	4/13/2019 15:20	9.6	0.25	0.03	0.12	28.1	4/13/2019 5:45	4/14/2019 3:20	21.7	0.19	0.28	14,604
4/16/2019 17:05	4/16/2019 19:20	2.3	0.10	0.04	0.12	78.3	4/16/2019 17:00	4/17/2019 7:15	14.3	0.10	0.15	5,268
4/18/2019 5:50	4/18/2019 7:20	1.5	0.10	0.07	0.24	35.2	4/18/2019 5:50	4/18/2019 18:40	12.9	0.10	0.14	4,587
4/18/2019 18:45	4/18/2019 19:50	1.1	0.07	0.06	0.12	12.1	4/18/2019 18:40	4/19/2019 4:05	9.5	0.11	0.14	3,678
4/19/2019 4:05	4/19/2019 16:00	11.9	0.13	0.01	0.12	8.8	4/19/2019 4:05	4/20/2019 3:55	23.9	0.13	0.21	11,148
4/22/2019 10:50	4/22/2019 17:45	6.9	0.26	0.04	0.12	68.8	4/22/2019 10:50	4/23/2019 5:45	19.0	0.13	0.27	8,721
5/14/2019 8:30	5/14/2019 12:30	4.0	0.05	0.01	0.12	519.6	5/14/2019 8:30	5/15/2019 0:30	16.1	0.04	0.05	2,499
5/15/2019 16:40	5/15/2019 19:30	2.8	0.06	0.02	0.12	31.7	5/15/2019 16:40	5/16/2019 7:30	14.9	0.05	0.05	2,541
5/16/2019 10:50	5/17/2019 6:25	19.6	0.83	0.04	0.24	17.1	5/16/2019 10:50	5/17/2019 18:20	31.6	0.17	0.46	18,771
5/20/2019 9:30	5/20/2019 22:40	13.2	0.31	0.02	0.12	77.2	5/20/2019 9:30	5/21/2019 10:40	25.3	0.11	0.21	9,636
5/24/2019 8:55	5/24/2019 10:20	1.4	0.03	0.02	0.12	83.7	5/24/2019 8:55	5/24/2019 22:15	13.4	0.04	0.05	2,121
5/25/2019 12:00	5/25/2019 16:25	4.4	0.16	0.04	0.12	110.8	5/25/2019 12:00	5/26/2019 4:25	16.5	0.08	0.15	4,593
6/6/2019 14:20	6/6/2019 18:10	3.8	0.08	0.02	0.36	286.8	6/6/2019 14:15	6/7/2019 6:10	16.0	0.04	0.05	2,148
6/7/2019 8:35	6/7/2019 12:30	3.9	0.03	0.01	0.12	15.7	6/7/2019 8:35	6/8/2019 0:30	16.0	0.02	0.03	1,182

Table D-5. Summary Statistics for Individual Storm Events at the MONMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
6/19/2019 18:35	6/20/2019 2:55	8.3	0.70	0.08	0.72	313.7	6/19/2019 18:30	6/20/2019 14:55	20.5	0.13	0.43	9,627
6/23/2019 6:35	6/23/2019 8:30	1.9	0.04	0.02	0.12	77.1	6/23/2019 6:30	6/23/2019 20:25	14.0	0.04	0.05	2,121
6/23/2019 23:15	6/24/2019 2:45	3.5	0.04	0.01	0.12	16.7	6/23/2019 23:10	6/24/2019 14:45	15.7	0.04	0.06	2,367
6/27/2019 2:20	6/27/2019 6:55	4.6	0.04	0.01	0.12	75.1	6/27/2019 2:15	6/27/2019 18:55	16.8	0.03	0.04	1,746
7/2/2019 12:55	7/2/2019 21:15	8.3	0.13	0.02	0.12	130.6	7/2/2019 12:55	7/3/2019 4:15	15.4	0.03	0.05	1,758
7/3/2019 4:15	7/3/2019 9:50	5.6	0.13	0.02	0.12	9.1	7/3/2019 4:15	7/3/2019 21:45	17.6	0.04	0.11	2,529
7/9/2019 21:05	7/10/2019 15:00	17.9	0.25	0.01	0.12	157.4	7/9/2019 21:00	7/11/2019 6:30	33.6	0.03	0.08	3,312
7/16/2019 1:45	7/16/2019 7:10	5.4	0.52	0.10	1.20	132.0	7/16/2019 1:40	7/16/2019 19:05	17.5	0.07	0.35	4,389
7/17/2019 5:30	7/17/2019 7:55	2.4	0.09	0.04	0.12	26.2	7/17/2019 5:30	7/17/2019 19:50	14.4	0.03	0.05	1,785
7/17/2019 21:40	7/18/2019 7:30	9.8	0.28	0.03	0.48	15.0	7/17/2019 21:40	7/18/2019 19:10	21.6	0.09	0.25	6,672
7/18/2019 19:10	7/19/2019 4:35	9.4	0.25	0.03	0.12	17.1	7/18/2019 19:10	7/19/2019 16:30	21.4	0.08	0.27	6,519
8/2/2019 2:55	8/2/2019 4:40	1.8	0.33	0.19	0.96	340.0	8/2/2019 2:55	8/2/2019 16:40	13.8	0.05	0.15	2,403
8/10/2019 3:35	8/10/2019 8:25	4.8	0.71	0.15	0.72	191.7	8/10/2019 3:30	8/10/2019 20:25	17.0	0.12	0.46	7,608
8/11/2019 6:50	8/11/2019 11:55	5.1	0.05	0.01	0.12	22.8	8/11/2019 6:45	8/11/2019 23:55	17.3	0.02	0.04	1,188
8/21/2019 5:20	8/21/2019 8:30	3.2	0.09	0.03	0.24	238.2	8/21/2019 5:15	8/21/2019 17:35	12.4	0.01	0.03	618
8/21/2019 17:40	8/21/2019 21:55	4.3	0.06	0.01	0.12	10.1	8/21/2019 17:35	8/22/2019 9:55	16.4	0.01	0.01	591
8/29/2019 18:05	8/29/2019 23:30	5.4	0.18	0.03	0.36	189.9	8/29/2019 18:00	8/30/2019 11:25	17.5	0.01	0.04	912
9/7/2019 19:30	9/7/2019 21:35	2.1	0.72	0.35	0.96	215.8	9/7/2019 19:30	9/8/2019 5:30	10.1	0.14	0.46	5,064
9/8/2019 5:30	9/8/2019 9:25	3.9	0.09	0.02	0.12	8.3	9/8/2019 5:30	9/8/2019 14:55	9.5	0.04	0.06	1,383
9/8/2019 14:55	9/8/2019 21:00	6.1	0.48	0.08	2.64	8.2	9/8/2019 14:55	9/9/2019 1:50	11.0	0.15	0.48	6,114
9/9/2019 1:50	9/9/2019 21:45	19.9	2.20	0.11	2.40	10.7	9/9/2019 1:50	9/10/2019 9:40	31.9	0.59	1.67	67,716
9/12/2019 19:50	9/12/2019 22:10	2.3	0.21	0.09	0.48	73.9	9/12/2019 19:50	9/13/2019 10:05	14.3	0.09	0.17	4,857
9/14/2019 20:20	9/15/2019 14:20	18.0	0.68	0.04	0.24	46.4	9/14/2019 20:15	9/16/2019 2:15	30.1	0.14	0.32	15,348
9/16/2019 17:30	9/16/2019 19:20	1.8	0.04	0.02	0.36	30.7	9/16/2019 17:25	9/17/2019 7:05	13.8	0.04	0.05	2,064
9/17/2019 7:05	9/18/2019 10:50	27.8	0.63	0.02	0.72	13.6	9/17/2019 7:05	9/18/2019 22:50	39.8	0.12	0.25	16,623
9/22/2019 5:35	9/23/2019 0:05	18.5	0.54	0.03	0.24	90.9	9/22/2019 5:35	9/23/2019 11:00	29.5	0.09	0.21	9,390
9/23/2019 11:00	9/23/2019 14:30	3.5	0.10	0.03	0.12	11.8	9/23/2019 11:00	9/24/2019 1:15	14.3	0.07	0.11	3,462
9/24/2019 1:15	9/24/2019 9:40	8.4	0.10	0.01	0.12	11.6	9/24/2019 1:15	9/24/2019 21:40	20.5	0.05	0.08	3,576
9/26/2019 4:50	9/26/2019 8:25	3.6	0.17	0.05	0.12	44.8	9/26/2019 4:50	9/26/2019 20:25	15.7	0.05	0.13	2,970
9/27/2019 1:00	9/27/2019 4:10	3.2	0.09	0.03	0.12	17.8	9/27/2019 0:55	9/27/2019 10:25	9.6	0.05	0.10	1,791
9/27/2019 10:25	9/28/2019 0:00	13.6	0.23	0.02	0.72	7.2	9/27/2019 10:25	9/28/2019 11:55	25.6	0.06	0.13	5,352
9/29/2019 1:20	9/29/2019 3:55	2.6	0.08	0.03	0.24	30.9	9/29/2019 1:15	9/29/2019 15:55	14.8	0.03	0.05	1,758

Table D-6. Summary Statistics for Individual Storm Events at the TOSMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 7:05	10/1/2018 14:10	7.1	0.08	0.01	0.12	32.8	10/1/2018 7:05	10/1/2018 15:40	8.7	0.39	0.73	12,267
10/1/2018 15:40	10/1/2018 20:00	4.3	0.33	0.08	0.24	6.5	10/1/2018 15:40	10/2/2018 8:00	16.4	0.90	3.95	53,256
10/2/2018 16:10	10/2/2018 19:30	3.3	0.06	0.02	0.24	21.3	10/2/2018 16:05	10/3/2018 7:25	15.4	0.34	0.67	19,131
10/5/2018 8:50	10/5/2018 18:40	9.8	0.43	0.04	0.24	63.2	10/5/2018 8:50	10/6/2018 6:40	21.9	0.83	2.08	65,184
10/7/2018 23:15	10/8/2018 5:15	6.0	0.04	0.01	0.12	53.5	10/7/2018 23:10	10/8/2018 9:40	10.6	0.36	0.50	13,887
10/8/2018 9:40	10/9/2018 5:45	20.1	0.77	0.04	0.36	10.4	10/8/2018 9:40	10/9/2018 17:45	32.2	1.10	4.15	127,467
10/25/2018 7:30	10/26/2018 8:55	25.4	0.88	0.03	0.36	387.1	10/25/2018 7:30	10/26/2018 20:55	37.5	0.89	4.58	119,760
10/27/2018 15:15	10/28/2018 6:30	15.3	1.27	0.08	0.60	30.6	10/27/2018 15:10	10/28/2018 14:25	23.3	2.07	8.61	174,255
10/28/2018 14:30	10/28/2018 21:40	7.2	0.13	0.02	0.24	8.3	10/28/2018 14:25	10/29/2018 9:40	19.3	0.64	1.21	44,304
10/30/2018 20:00	10/31/2018 2:05	6.1	0.15	0.02	0.24	46.6	10/30/2018 20:00	10/31/2018 14:00	18.1	0.48	0.99	31,500
10/31/2018 16:10	10/31/2018 20:10	4.0	0.03	0.01	0.12	17.8	10/31/2018 16:05	11/1/2018 0:10	8.2	0.42	0.50	12,480
11/1/2018 0:15	11/1/2018 9:45	9.5	0.13	0.01	0.12	25.9	11/1/2018 0:10	11/1/2018 21:40	21.6	0.48	0.92	37,473
11/1/2018 23:45	11/2/2018 17:25	17.7	0.48	0.03	0.60	14.8	11/1/2018 23:45	11/3/2018 5:25	29.8	0.59	1.37	62,697
11/3/2018 9:50	11/3/2018 19:05	9.3	0.21	0.02	0.12	17.8	11/3/2018 9:45	11/4/2018 2:10	16.5	0.65	1.57	38,577
11/4/2018 2:10	11/4/2018 6:05	3.9	0.04	0.01	0.12	8.9	11/4/2018 2:10	11/4/2018 14:25	12.3	0.44	0.67	19,434
11/4/2018 14:25	11/4/2018 20:10	5.8	0.15	0.03	0.48	12.2	11/4/2018 14:25	11/5/2018 8:10	17.8	1.09	9.60	69,876
11/5/2018 14:35	11/5/2018 15:30	0.9	0.04	0.04	0.24	22.6	11/5/2018 14:35	11/6/2018 0:10	9.7	0.53	0.99	18,387
11/6/2018 0:10	11/6/2018 0:50	0.7	0.05	0.08	0.12	9.6	11/6/2018 0:10	11/6/2018 12:45	12.7	0.48	0.79	21,789
11/9/2018 9:50	11/9/2018 11:40	1.8	0.08	0.04	0.12	81.4	11/9/2018 9:45	11/9/2018 23:35	13.9	0.41	0.85	20,727
11/13/2018 23:35	11/14/2018 8:30	8.9	0.11	0.01	0.24	108.6	11/13/2018 23:35	11/14/2018 20:25	20.9	0.45	0.85	34,065
11/16/2018 1:15	11/16/2018 5:25	4.2	0.07	0.02	0.12	41.4	11/16/2018 1:15	11/16/2018 17:25	16.3	0.41	0.55	23,718
11/21/2018 21:40	11/22/2018 4:30	6.8	0.13	0.02	0.12	139.9	11/21/2018 21:40	11/22/2018 11:45	14.2	0.57	0.99	28,983
11/22/2018 11:45	11/23/2018 21:50	34.1	1.21	0.04	0.48	8.1	11/22/2018 11:45	11/24/2018 9:45	46.1	1.49	8.30	246,720
11/26/2018 4:20	11/27/2018 6:20	26.0	1.38	0.05	0.24	56.2	11/26/2018 4:15	11/27/2018 14:45	34.6	2.47	6.82	307,092
11/27/2018 14:50	11/27/2018 20:20	5.5	0.30	0.05	0.36	8.9	11/27/2018 14:45	11/28/2018 3:55	13.3	1.68	5.03	80,028
11/28/2018 3:55	11/28/2018 4:55	1.0	0.16	0.16	0.24	9.4	11/28/2018 3:55	11/28/2018 11:10	7.3	1.78	6.02	47,001
11/28/2018 11:10	11/28/2018 17:45	6.6	0.06	0.01	0.12	6.4	11/28/2018 11:10	11/29/2018 5:45	18.7	0.98	1.29	65,730
11/30/2018 19:10	11/30/2018 22:55	3.8	0.19	0.05	0.12	52.2	11/30/2018 19:05	12/1/2018 10:50	15.8	0.84	3.01	47,970
12/1/2018 11:15	12/1/2018 15:55	4.7	0.03	0.01	0.12	13.8	12/1/2018 11:10	12/2/2018 3:55	16.8	0.54	0.73	32,772
12/9/2018 9:15	12/9/2018 20:40	11.4	0.64	0.06	0.12	203.8	12/9/2018 9:10	12/10/2018 8:00	22.9	1.46	3.19	120,180
12/10/2018 8:00	12/10/2018 11:05	3.1	0.05	0.02	0.24	11.8	12/10/2018 8:00	12/10/2018 23:05	15.2	0.65	1.45	35,355
12/11/2018 3:00	12/12/2018 0:25	21.4	0.53	0.02	0.24	16.1	12/11/2018 2:55	12/12/2018 12:20	33.5	1.21	4.36	145,338
12/12/2018 18:40	12/13/2018 16:35	21.9	0.17	0.01	0.12	20.2	12/12/2018 18:40	12/14/2018 4:30	33.9	0.66	1.14	80,115
12/15/2018 22:45	12/16/2018 8:40	9.9	0.29	0.03	0.24	56.7	12/15/2018 22:40	12/16/2018 14:15	15.7	0.99	3.01	55,767
12/16/2018 14:20	12/16/2018 21:45	7.4	0.22	0.03	0.24	9.4	12/16/2018 14:15	12/17/2018 5:15	15.1	0.97	2.37	52,899
12/17/2018 5:20	12/17/2018 5:55	0.6	0.03	0.05	0.12	7.8	12/17/2018 5:15	12/17/2018 16:50	11.7	0.63	1.06	26,535
12/17/2018 16:50	12/18/2018 8:05	15.3	0.59	0.04	0.24	19.2	12/17/2018 16:50	12/18/2018 13:30	20.8	1.67	4.36	124,749
12/18/2018 13:35	12/19/2018 0:00	10.4	0.29	0.03	0.36	7.3	12/18/2018 13:30	12/19/2018 11:55	22.5	1.13	5.27	91,566
12/20/2018 1:55	12/20/2018 16:05	14.2	0.23	0.02	0.24	31.7	12/20/2018 1:50	12/21/2018 4:05	26.3	0.80	3.01	76,143
12/22/2018 17:45	12/23/2018 14:05	20.3	0.80	0.04	0.36	55.0	12/22/2018 17:45	12/24/2018 2:00	32.3	1.68	6.28	194,993
12/26/2018 9:10	12/26/2018 11:40	2.5	0.06	0.02	0.12	72.2	12/26/2018 9:10	12/26/2018 23:40	14.6	0.61	0.99	32,064
12/27/2018 1:35	12/27/2018 5:55	4.3	0.09	0.02	0.24	15.0	12/27/2018 1:30	12/27/2018 17:55	16.5	0.66	1.21	38,910
12/28/2018 4:50	12/28/2018 21:35	16.8	0.67	0.04	0.24	26.8	12/28/2018 4:50	12/29/2018 9:30	28.8	1.80	5.27	186,186
12/29/2018 12:55	12/30/2018 2:30	13.6	0.68	0.05	0.36	16.2	12/29/2018 12:55	12/30/2018 14:25	25.6	2.51	7.10	230,760

Table D-6. Summary Statistics for Individual Storm Events at the TOSMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
1/2/2019 23:50	1/4/2019 6:55	31.1	0.95	0.03	0.36	93.4	1/2/2019 23:45	1/4/2019 14:55	39.3	1.97	5.76	278,055
1/4/2019 14:55	1/4/2019 18:00	3.1	0.03	0.01	0.12	10.2	1/4/2019 14:55	1/5/2019 5:55	15.1	0.83	1.06	44,979
1/5/2019 17:25	1/6/2019 2:50	9.4	0.20	0.02	0.24	36.8	1/5/2019 17:25	1/6/2019 14:45	21.4	1.07	2.84	82,152
1/6/2019 17:00	1/7/2019 0:55	7.9	0.53	0.07	0.24	15.0	1/6/2019 17:00	1/7/2019 12:55	20.0	2.65	8.93	191,082
1/8/2019 8:50	1/10/2019 9:55	49.1	0.49	0.01	0.12	34.7	1/8/2019 8:50	1/10/2019 10:40	49.9	1.06	2.08	190,605
1/10/2019 10:40	1/10/2019 13:35	2.9	0.03	0.01	0.12	9.1	1/10/2019 10:40	1/11/2019 1:30	14.9	0.78	1.06	41,622
1/17/2019 1:55	1/17/2019 3:15	1.3	0.10	0.08	0.12	160.0	1/17/2019 1:50	1/17/2019 15:10	13.4	0.70	2.08	33,861
1/17/2019 17:20	1/17/2019 22:45	5.4	0.03	0.01	0.12	14.6	1/17/2019 17:20	1/18/2019 4:15	11.0	0.53	0.61	20,985
1/18/2019 4:15	1/18/2019 5:35	1.3	0.07	0.05	0.12	25.5	1/18/2019 4:15	1/18/2019 17:35	13.4	0.64	1.94	30,924
1/18/2019 18:30	1/19/2019 2:20	7.8	0.23	0.03	0.24	13.4	1/18/2019 18:30	1/19/2019 13:40	19.3	1.13	4.58	78,180
1/19/2019 13:40	1/19/2019 16:40	3.0	0.04	0.01	0.24	15.2	1/19/2019 13:40	1/20/2019 4:40	15.1	0.62	1.14	33,516
1/22/2019 13:35	1/23/2019 9:30	19.9	0.82	0.04	0.36	71.9	1/22/2019 13:30	1/23/2019 21:30	32.1	1.63	5.76	188,381
1/24/2019 2:45	1/24/2019 8:10	5.4	0.03	0.01	0.12	18.6	1/24/2019 2:45	1/24/2019 20:10	17.5	0.55	0.73	34,647
2/1/2019 4:40	2/1/2019 21:55	17.3	0.66	0.04	0.12	212.5	2/1/2019 4:40	2/2/2019 9:55	29.3	1.10	3.01	116,493
2/5/2019 11:00	2/5/2019 14:55	3.9	0.20	0.05	0.24	87.8	2/5/2019 11:00	2/6/2019 2:55	16.0	0.44	0.61	25,503
2/6/2019 10:45	2/6/2019 15:15	4.5	0.17	0.04	0.24	20.5	2/6/2019 10:40	2/7/2019 3:10	16.6	0.40	0.50	24,108
2/7/2019 11:10	2/7/2019 11:20	0.2	0.04	0.24	0.24	20.5	2/7/2019 11:10	2/7/2019 23:15	12.2	0.38	0.43	16,746
2/9/2019 14:20	2/9/2019 15:35	1.3	0.03	0.02	0.12	51.2	2/9/2019 14:15	2/10/2019 3:30	13.3	0.40	0.50	19,230
2/13/2019 11:15	2/13/2019 13:20	2.1	0.20	0.10	0.24	144.1	2/13/2019 11:10	2/14/2019 1:15	14.2	1.27	1.69	64,638
2/14/2019 8:45	2/14/2019 21:15	12.5	0.68	0.05	0.12	19.7	2/14/2019 8:45	2/15/2019 9:10	24.5	1.38	3.37	121,452
2/16/2019 8:50	2/16/2019 22:25	13.6	0.36	0.03	0.24	36.8	2/16/2019 8:50	2/17/2019 10:25	25.7	1.67	3.55	154,347
2/19/2019 13:25	2/20/2019 2:55	13.5	0.43	0.03	0.24	64.5	2/19/2019 13:25	2/20/2019 14:55	25.6	1.53	4.36	140,748
2/22/2019 12:15	2/22/2019 15:55	3.7	0.28	0.08	0.24	59.8	2/22/2019 12:10	2/23/2019 3:55	15.8	1.13	3.75	64,551
2/23/2019 12:35	2/23/2019 20:45	8.2	0.21	0.03	0.36	21.8	2/23/2019 12:30	2/24/2019 8:45	20.3	0.90	2.84	66,117
3/6/2019 14:45	3/6/2019 19:20	4.6	0.08	0.02	0.12	258.3	3/6/2019 14:45	3/7/2019 7:20	16.7	0.42	0.61	25,458
3/7/2019 9:05	3/7/2019 16:05	7.0	0.18	0.03	0.24	15.9	3/7/2019 9:00	3/8/2019 4:05	19.2	0.59	1.69	40,989
3/8/2019 8:25	3/8/2019 9:55	1.5	0.12	0.08	0.24	22.1	3/8/2019 8:25	3/8/2019 21:55	13.6	0.62	1.69	30,393
3/11/2019 17:40	3/12/2019 20:35	26.9	1.17	0.04	0.24	80.0	3/11/2019 17:35	3/13/2019 8:35	39.1	1.69	6.02	237,587
3/25/2019 17:00	3/26/2019 7:35	14.6	0.27	0.02	0.12	308.8	3/25/2019 17:00	3/26/2019 19:30	26.6	0.61	2.22	58,533
4/3/2019 1:20	4/3/2019 8:45	7.4	0.06	0.01	0.12	191.8	4/3/2019 1:20	4/3/2019 20:45	19.5	0.44	0.67	30,837
4/4/2019 21:25	4/5/2019 3:55	6.5	0.21	0.03	0.12	40.4	4/4/2019 21:20	4/5/2019 11:00	13.8	0.72	1.57	35,790
4/5/2019 11:00	4/5/2019 17:35	6.6	0.32	0.05	0.48	7.6	4/5/2019 11:00	4/6/2019 5:35	18.7	0.97	3.55	65,163
4/6/2019 6:05	4/6/2019 12:55	6.8	0.10	0.01	0.24	14.8	4/6/2019 6:00	4/6/2019 21:55	16.0	0.62	1.14	35,772
4/6/2019 21:55	4/7/2019 4:45	6.8	0.41	0.06	0.12	13.0	4/6/2019 21:55	4/7/2019 16:40	18.8	1.55	4.15	104,748
4/8/2019 17:15	4/9/2019 13:00	19.8	0.55	0.03	0.48	37.7	4/8/2019 17:10	4/10/2019 0:55	31.8	1.19	7.69	136,497
4/10/2019 10:35	4/11/2019 13:50	27.3	0.54	0.02	0.24	23.3	4/10/2019 10:30	4/11/2019 21:55	35.5	1.05	2.37	133,608
4/11/2019 21:55	4/12/2019 6:35	8.7	0.36	0.04	0.24	9.2	4/11/2019 21:55	4/12/2019 18:30	20.7	1.47	4.58	109,080
4/13/2019 5:30	4/13/2019 15:40	10.2	0.26	0.03	0.12	27.2	4/13/2019 5:25	4/14/2019 3:40	22.3	0.96	2.08	76,956
4/14/2019 18:55	4/14/2019 21:25	2.5	0.04	0.02	0.12	28.1	4/14/2019 18:55	4/15/2019 9:20	14.5	0.59	0.67	30,636
4/16/2019 16:55	4/16/2019 19:40	2.8	0.14	0.05	0.12	46.0	4/16/2019 16:50	4/17/2019 7:40	14.9	0.74	1.81	39,570
4/18/2019 4:55	4/18/2019 7:25	2.5	0.12	0.05	0.12	34.0	4/18/2019 4:50	4/18/2019 17:55	13.2	0.69	1.81	32,814
4/18/2019 17:55	4/18/2019 22:45	4.8	0.10	0.02	0.12	11.2	4/18/2019 17:55	4/19/2019 4:40	10.8	0.73	1.94	28,518
4/19/2019 4:40	4/19/2019 22:45	18.1	0.26	0.01	0.12	9.1	4/19/2019 4:40	4/20/2019 10:40	30.1	0.82	1.94	88,983
4/22/2019 11:00	4/22/2019 17:20	6.3	0.22	0.03	0.24	64.7	4/22/2019 11:00	4/23/2019 5:15	18.3	0.78	2.08	51,546
5/14/2019 8:05	5/14/2019 14:50	6.8	0.06	0.01	0.12	519.4	5/14/2019 8:00	5/15/2019 2:45	18.8	0.39	0.61	26,517

Table D-6. Summary Statistics for Individual Storm Events at the TOSMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
5/15/2019 15:45	5/15/2019 19:45	4.0	0.10	0.03	0.12	30.6	5/15/2019 15:40	5/16/2019 7:40	16.1	0.46	0.73	26,508
5/16/2019 13:35	5/17/2019 7:15	17.7	0.78	0.04	0.24	19.2	5/16/2019 13:30	5/17/2019 19:15	29.8	1.23	4.58	131,784
5/20/2019 9:35	5/20/2019 22:45	13.2	0.43	0.03	0.12	77.3	5/20/2019 9:30	5/21/2019 10:40	25.3	0.83	2.68	75,453
5/25/2019 11:10	5/25/2019 17:00	5.8	0.24	0.04	0.12	110.2	5/25/2019 11:10	5/26/2019 5:00	17.9	0.65	1.45	41,718
6/6/2019 14:40	6/6/2019 18:25	3.8	0.19	0.05	0.48	286.8	6/6/2019 14:35	6/7/2019 6:20	15.8	0.54	1.80	30,615
6/19/2019 15:45	6/20/2019 3:00	11.3	0.59	0.05	0.36	310.2	6/19/2019 15:40	6/20/2019 14:55	23.3	1.13	5.50	94,620
6/23/2019 5:50	6/23/2019 7:25	1.6	0.05	0.03	0.12	76.2	6/23/2019 5:50	6/23/2019 19:25	13.7	0.52	0.79	25,500
6/24/2019 0:25	6/24/2019 3:40	3.3	0.06	0.02	0.12	18.2	6/24/2019 0:20	6/24/2019 15:40	15.4	0.58	1.10	32,322
6/27/2019 2:00	6/27/2019 6:30	4.5	0.06	0.01	0.12	72.7	6/27/2019 2:00	6/27/2019 18:30	16.6	0.57	1.30	34,287
7/2/2019 12:40	7/2/2019 21:05	8.4	0.08	0.01	0.12	130.3	7/2/2019 12:40	7/3/2019 1:50	13.3	0.63	1.70	30,162
7/3/2019 1:55	7/3/2019 7:50	5.9	0.10	0.02	0.12	13.2	7/3/2019 1:50	7/3/2019 19:50	18.1	0.72	1.60	46,857
7/7/2019 20:25	7/7/2019 22:05	1.7	0.08	0.05	0.12	112.8	7/7/2019 20:25	7/8/2019 10:05	13.8	0.70	1.30	34,584
7/9/2019 20:50	7/10/2019 18:10	21.3	0.30	0.01	0.12	47.6	7/9/2019 20:45	7/11/2019 6:10	33.5	0.67	2.10	81,294
7/15/2019 9:35	7/15/2019 12:10	2.6	0.05	0.02	0.12	115.0	7/15/2019 9:30	7/16/2019 0:10	14.8	0.34	0.55	17,820
7/16/2019 2:30	7/16/2019 4:45	2.3	0.29	0.13	0.84	15.3	7/16/2019 2:30	7/16/2019 16:40	14.3	0.88	2.70	45,135
7/17/2019 5:20	7/17/2019 11:40	6.3	0.10	0.02	0.24	25.0	7/17/2019 5:15	7/17/2019 13:40	8.5	0.53	0.85	16,284
7/17/2019 13:45	7/17/2019 15:45	2.0	0.04	0.02	0.12	6.8	7/17/2019 13:40	7/17/2019 22:05	8.5	0.45	0.61	13,914
7/17/2019 22:05	7/18/2019 2:00	3.9	0.16	0.04	0.36	8.3	7/17/2019 22:05	7/18/2019 14:00	16.0	0.67	1.90	38,835
7/18/2019 17:50	7/19/2019 4:35	10.8	0.65	0.06	0.48	17.5	7/18/2019 17:50	7/19/2019 16:30	22.8	1.32	4.00	107,847
8/2/2019 2:55	8/2/2019 4:35	1.7	0.28	0.17	0.48	338.7	8/2/2019 2:55	8/2/2019 16:30	13.7	0.80	3.50	39,390
8/10/2019 3:55	8/10/2019 8:40	4.8	0.72	0.15	0.48	191.9	8/10/2019 3:55	8/10/2019 20:35	16.8	1.67	7.10	100,890
8/11/2019 7:25	8/11/2019 8:15	0.8	0.10	0.12	0.24	23.2	8/11/2019 7:25	8/11/2019 20:10	12.8	0.50	1.60	23,160
8/21/2019 5:15	8/21/2019 8:25	3.2	0.11	0.03	0.24	237.4	8/21/2019 5:10	8/21/2019 16:05	11.0	0.50	1.50	19,962
8/21/2019 16:05	8/21/2019 21:20	5.3	0.11	0.02	0.24	8.4	8/21/2019 16:05	8/22/2019 9:20	17.3	0.45	0.79	28,005
8/29/2019 18:00	8/29/2019 23:30	5.5	0.24	0.04	0.36	189.7	8/29/2019 17:55	8/30/2019 11:25	17.6	0.55	1.69	34,857
9/7/2019 19:35	9/7/2019 22:05	2.5	0.56	0.22	0.84	212.7	9/7/2019 19:30	9/8/2019 5:35	10.2	1.67	5.03	60,999
9/8/2019 5:35	9/8/2019 9:55	4.3	0.07	0.02	0.12	8.5	9/8/2019 5:35	9/8/2019 14:55	9.4	0.58	1.06	19,572
9/8/2019 14:55	9/8/2019 15:05	0.2	0.07	0.42	0.60	8.4	9/8/2019 14:55	9/8/2019 21:10	6.3	0.48	0.99	11,037
9/8/2019 21:15	9/9/2019 18:15	21.0	0.99	0.05	1.08	6.2	9/8/2019 21:10	9/10/2019 6:10	33.1	1.16	5.51	137,643
9/12/2019 19:50	9/12/2019 22:10	2.3	0.28	0.12	0.72	74.1	9/12/2019 19:50	9/13/2019 10:05	14.3	0.83	4.15	42,798
9/14/2019 20:05	9/15/2019 11:05	15.0	0.64	0.04	0.24	46.3	9/14/2019 20:00	9/15/2019 23:00	27.1	0.98	3.55	95,775
9/16/2019 17:15	9/16/2019 19:15	2.0	0.03	0.02	0.12	31.0	9/16/2019 17:10	9/17/2019 2:45	9.7	0.35	0.55	12,114
9/17/2019 2:45	9/18/2019 5:05	26.3	0.72	0.03	0.60	40.5	9/17/2019 2:45	9/18/2019 17:00	38.3	0.89	3.55	123,342
9/22/2019 6:10	9/22/2019 23:20	17.2	0.38	0.02	0.24	97.8	9/22/2019 6:10	9/23/2019 11:00	28.9	0.60	1.57	62,727
9/23/2019 11:00	9/23/2019 16:30	5.5	0.09	0.02	0.12	14.3	9/23/2019 11:00	9/24/2019 4:25	17.5	0.42	1.06	26,316
9/26/2019 5:15	9/26/2019 8:00	2.8	0.11	0.04	0.12	63.3	9/26/2019 5:10	9/26/2019 20:00	14.9	0.36	0.79	19,380
9/27/2019 1:55	9/27/2019 5:40	3.8	0.40	0.11	0.48	18.8	9/27/2019 1:50	9/27/2019 13:25	11.7	1.40	4.80	58,998
9/27/2019 13:25	9/28/2019 1:00	11.6	0.19	0.02	0.36	8.5	9/27/2019 13:25	9/28/2019 13:00	23.7	0.58	2.68	49,320
9/29/2019 1:15	9/29/2019 4:25	3.2	0.04	0.01	0.12	31.2	9/29/2019 1:15	9/29/2019 16:25	15.3	0.29	0.43	15,858

Table D-7. Summary Statistics for Individual Storm Events at the TOSMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 7:05	10/1/2018 14:10	7.1	0.08	0.01	0.12	32.8	10/1/2018 7:05	10/1/2018 15:40	8.7	0.20	0.40	6,240
10/1/2018 15:40	10/1/2018 20:00	4.3	0.33	0.08	0.24	6.5	10/1/2018 15:40	10/2/2018 8:00	16.4	0.45	2.06	26,865
10/2/2018 16:10	10/2/2018 19:30	3.3	0.06	0.02	0.24	21.3	10/2/2018 16:05	10/3/2018 7:25	15.4	0.20	0.45	10,917
10/5/2018 8:50	10/5/2018 18:40	9.8	0.43	0.04	0.24	63.2	10/5/2018 8:50	10/6/2018 6:40	21.9	0.47	1.33	37,290
10/7/2018 23:15	10/8/2018 5:15	6.0	0.04	0.01	0.12	53.5	10/7/2018 23:10	10/8/2018 9:40	10.6	0.19	0.28	7,068
10/8/2018 9:40	10/9/2018 5:45	20.1	0.77	0.04	0.36	10.4	10/8/2018 9:40	10/9/2018 17:45	32.2	0.64	2.60	73,944
10/25/2018 7:30	10/26/2018 8:55	25.4	0.88	0.03	0.36	387.1	10/25/2018 7:30	10/26/2018 20:55	37.5	0.57	3.45	76,746
10/27/2018 15:15	10/28/2018 6:30	15.3	1.27	0.08	0.60	30.6	10/27/2018 15:10	10/28/2018 14:25	23.3	1.55	6.20	130,230
10/28/2018 14:30	10/28/2018 21:40	7.2	0.13	0.02	0.24	8.3	10/28/2018 14:25	10/29/2018 9:40	19.3	0.45	0.99	31,251
10/30/2018 20:00	10/31/2018 2:05	6.1	0.15	0.02	0.24	46.6	10/30/2018 20:00	10/31/2018 14:00	18.1	0.39	0.80	25,620
10/31/2018 16:10	10/31/2018 20:10	4.0	0.03	0.01	0.12	17.8	10/31/2018 16:05	11/1/2018 0:10	8.2	0.35	0.40	10,392
11/1/2018 0:15	11/1/2018 9:45	9.5	0.13	0.01	0.12	25.9	11/1/2018 0:10	11/1/2018 21:40	21.6	0.40	0.80	30,720
11/1/2018 23:45	11/2/2018 17:25	17.7	0.48	0.03	0.60	14.8	11/1/2018 23:45	11/3/2018 5:25	29.8	0.46	1.33	48,924
11/3/2018 9:50	11/3/2018 19:05	9.3	0.21	0.02	0.12	17.8	11/3/2018 9:45	11/4/2018 2:10	16.5	0.57	1.60	34,041
11/4/2018 2:10	11/4/2018 6:05	3.9	0.04	0.01	0.12	8.9	11/4/2018 2:10	11/4/2018 14:25	12.3	0.40	0.56	17,871
11/4/2018 14:25	11/4/2018 20:10	5.8	0.15	0.03	0.48	12.2	11/4/2018 14:25	11/5/2018 8:10	17.8	0.86	9.36	54,975
11/5/2018 14:35	11/5/2018 15:30	0.9	0.04	0.04	0.24	22.6	11/5/2018 14:35	11/6/2018 0:10	9.7	0.41	0.99	14,199
11/6/2018 0:10	11/6/2018 0:50	0.7	0.05	0.08	0.12	9.6	11/6/2018 0:10	11/6/2018 12:45	12.7	0.39	0.73	17,811
11/9/2018 9:50	11/9/2018 11:40	1.8	0.08	0.04	0.12	81.4	11/9/2018 9:45	11/9/2018 23:35	13.9	0.36	0.73	17,907
11/13/2018 23:35	11/14/2018 8:30	8.9	0.11	0.01	0.24	108.6	11/13/2018 23:35	11/14/2018 20:25	20.9	0.33	0.61	24,663
11/16/2018 1:15	11/16/2018 5:25	4.2	0.07	0.02	0.12	41.4	11/16/2018 1:15	11/16/2018 17:25	16.3	0.28	0.36	16,104
11/21/2018 21:40	11/22/2018 4:30	6.8	0.13	0.02	0.12	139.9	11/21/2018 21:40	11/22/2018 11:45	14.2	0.42	0.73	21,654
11/22/2018 11:45	11/23/2018 21:50	34.1	1.21	0.04	0.48	8.1	11/22/2018 11:45	11/24/2018 9:45	46.1	0.98	6.00	162,214
11/26/2018 4:20	11/27/2018 6:20	26.0	1.38	0.05	0.24	56.2	11/26/2018 4:15	11/27/2018 14:45	34.6	1.81	4.75	225,588
11/27/2018 14:50	11/27/2018 20:20	5.5	0.30	0.05	0.36	8.9	11/27/2018 14:45	11/28/2018 3:55	13.3	1.19	4.20	56,766
11/28/2018 3:55	11/28/2018 4:55	1.0	0.16	0.16	0.24	9.4	11/28/2018 3:55	11/28/2018 11:10	7.3	1.25	4.75	32,934
11/28/2018 11:10	11/28/2018 17:45	6.6	0.06	0.01	0.12	6.4	11/28/2018 11:10	11/29/2018 5:45	18.7	0.63	0.89	42,006
11/30/2018 19:10	11/30/2018 22:55	3.8	0.19	0.05	0.12	52.2	11/30/2018 19:05	12/1/2018 10:50	15.8	0.65	2.60	36,945
12/1/2018 11:15	12/1/2018 15:55	4.7	0.03	0.01	0.12	13.8	12/1/2018 11:10	12/2/2018 3:55	16.8	0.44	0.56	26,802
12/9/2018 9:15	12/9/2018 20:40	11.4	0.64	0.06	0.12	203.8	12/9/2018 9:10	12/10/2018 8:00	22.9	1.34	2.80	110,478
12/10/2018 8:00	12/10/2018 11:05	3.1	0.05	0.02	0.24	11.8	12/10/2018 8:00	12/10/2018 23:05	15.2	0.57	1.60	30,921
12/11/2018 3:00	12/12/2018 0:25	21.4	0.53	0.02	0.24	16.1	12/11/2018 2:55	12/12/2018 12:20	33.5	0.91	3.69	109,494
12/12/2018 18:40	12/13/2018 16:35	21.9	0.17	0.01	0.12	20.2	12/12/2018 18:40	12/14/2018 4:30	33.9	0.48	0.89	58,650
12/15/2018 22:45	12/16/2018 8:40	9.9	0.29	0.03	0.24	56.7	12/15/2018 22:40	12/16/2018 14:15	15.7	0.79	2.60	44,589
12/16/2018 14:20	12/16/2018 21:45	7.4	0.22	0.03	0.24	9.4	12/16/2018 14:15	12/17/2018 5:15	15.1	0.71	2.06	38,817
12/17/2018 5:20	12/17/2018 5:55	0.6	0.03	0.05	0.12	7.8	12/17/2018 5:15	12/17/2018 16:50	11.7	0.47	0.73	19,713
12/17/2018 16:50	12/18/2018 8:05	15.3	0.59	0.04	0.24	19.2	12/17/2018 16:50	12/18/2018 13:30	20.8	1.27	2.80	94,683
12/18/2018 13:35	12/19/2018 0:00	10.4	0.29	0.03	0.36	7.3	12/18/2018 13:30	12/19/2018 11:55	22.5	0.82	3.45	66,552
12/20/2018 1:55	12/20/2018 16:05	14.2	0.23	0.02	0.24	31.7	12/20/2018 1:50	12/21/2018 4:05	26.3	0.61	2.41	57,867
12/22/2018 17:45	12/23/2018 14:05	20.3	0.80	0.04	0.36	55.0	12/22/2018 17:45	12/24/2018 2:00	32.3	1.41	6.00	164,649
12/26/2018 9:10	12/26/2018 11:40	2.5	0.06	0.02	0.12	72.2	12/26/2018 9:10	12/26/2018 23:40	14.6	0.46	0.80	24,333
12/27/2018 1:35	12/27/2018 5:55	4.3	0.09	0.02	0.24	15.0	12/27/2018 1:30	12/27/2018 17:55	16.5	0.50	1.10	29,526
12/28/2018 4:50	12/28/2018 21:35	16.8	0.67	0.04	0.24	26.8	12/28/2018 4:50	12/29/2018 9:30	28.8	1.26	3.45	130,314

Table D-7. Summary Statistics for Individual Storm Events at the TOSMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
12/29/2018 12:55	12/30/2018 2:30	13.6	0.68	0.05	0.36	16.2	12/29/2018 12:55	12/30/2018 14:25	25.6	1.66	4.47	152,829
1/2/2019 23:50	1/4/2019 6:55	31.1	0.95	0.03	0.36	93.4	1/2/2019 23:45	1/4/2019 14:55	39.3	1.16	2.80	163,296
1/4/2019 14:55	1/4/2019 18:00	3.1	0.03	0.01	0.12	10.2	1/4/2019 14:55	1/5/2019 5:55	15.1	0.53	0.73	28,662
1/5/2019 17:25	1/6/2019 2:50	9.4	0.20	0.02	0.24	36.8	1/5/2019 17:25	1/6/2019 14:45	21.4	0.59	1.74	45,516
1/6/2019 17:00	1/7/2019 0:55	7.9	0.53	0.07	0.24	15.0	1/6/2019 17:00	1/7/2019 12:55	20.0	1.38	4.47	99,054
1/8/2019 8:50	1/10/2019 9:55	49.1	0.49	0.01	0.12	34.7	1/8/2019 8:50	1/10/2019 10:40	49.9	0.62	1.10	110,643
1/10/2019 10:40	1/10/2019 13:35	2.9	0.03	0.01	0.12	9.1	1/10/2019 10:40	1/11/2019 1:30	14.9	0.46	0.67	24,915
1/17/2019 1:55	1/17/2019 3:15	1.3	0.10	0.08	0.12	160.0	1/17/2019 1:50	1/17/2019 15:10	13.4	0.36	0.89	17,187
1/17/2019 17:20	1/17/2019 22:45	5.4	0.03	0.01	0.12	14.6	1/17/2019 17:20	1/18/2019 4:15	11.0	0.28	0.32	11,244
1/18/2019 4:15	1/18/2019 5:35	1.3	0.07	0.05	0.12	25.5	1/18/2019 4:15	1/18/2019 17:35	13.4	0.33	0.80	15,864
1/18/2019 18:30	1/19/2019 2:20	7.8	0.23	0.03	0.24	13.4	1/18/2019 18:30	1/19/2019 13:40	19.3	0.41	1.21	28,431
1/19/2019 13:40	1/19/2019 16:40	3.0	0.04	0.01	0.24	15.2	1/19/2019 13:40	1/20/2019 4:40	15.1	0.25	0.40	13,800
1/22/2019 13:35	1/23/2019 9:30	19.9	0.82	0.04	0.36	71.9	1/22/2019 13:30	1/23/2019 21:30	32.1	0.57	2.60	65,757
1/24/2019 2:45	1/24/2019 8:10	5.4	0.03	0.01	0.12	18.6	1/24/2019 2:45	1/24/2019 20:10	17.5	0.21	0.24	13,329
2/1/2019 4:40	2/1/2019 21:55	17.3	0.66	0.04	0.12	212.5	2/1/2019 4:40	2/2/2019 9:55	29.3	0.58	1.90	61,452
2/5/2019 11:00	2/5/2019 14:55	3.9	0.20	0.05	0.24	87.8	2/5/2019 11:00	2/6/2019 2:55	16.0	0.22	0.32	12,441
2/6/2019 10:45	2/6/2019 15:15	4.5	0.17	0.04	0.24	20.5	2/6/2019 10:40	2/7/2019 3:10	16.6	0.21	0.28	12,351
2/7/2019 11:10	2/7/2019 11:20	0.2	0.04	0.24	0.24	20.5	2/7/2019 11:10	2/7/2019 23:15	12.2	0.19	0.21	8,307
2/9/2019 14:20	2/9/2019 15:35	1.3	0.03	0.02	0.12	51.2	2/9/2019 14:15	2/10/2019 3:30	13.3	0.21	0.28	9,885
2/13/2019 11:15	2/13/2019 13:20	2.1	0.20	0.10	0.24	144.1	2/13/2019 11:10	2/14/2019 1:15	14.2	0.76	1.03	38,945
2/14/2019 8:45	2/14/2019 21:15	12.5	0.68	0.05	0.12	19.7	2/14/2019 8:45	2/15/2019 9:10	24.5	0.85	2.07	74,969
2/16/2019 8:50	2/16/2019 22:25	13.6	0.36	0.03	0.24	36.8	2/16/2019 8:50	2/17/2019 10:25	25.7	1.05	2.22	96,844
2/19/2019 13:25	2/20/2019 2:55	13.5	0.43	0.03	0.24	64.5	2/19/2019 13:25	2/20/2019 14:55	25.6	0.99	2.81	90,886
2/22/2019 12:15	2/22/2019 15:55	3.7	0.28	0.08	0.24	59.8	2/22/2019 12:10	2/23/2019 3:55	15.8	0.75	2.47	42,708
2/23/2019 12:35	2/23/2019 20:45	8.2	0.21	0.03	0.36	21.8	2/23/2019 12:30	2/24/2019 8:45	20.3	0.60	1.89	44,171
3/6/2019 14:45	3/6/2019 19:20	4.6	0.08	0.02	0.12	258.3	3/6/2019 14:45	3/7/2019 7:20	16.7	0.20	0.28	11,940
3/7/2019 9:05	3/7/2019 16:05	7.0	0.18	0.03	0.24	15.9	3/7/2019 9:00	3/8/2019 4:05	19.2	0.31	1.33	21,072
3/8/2019 8:25	3/8/2019 9:55	1.5	0.12	0.08	0.24	22.1	3/8/2019 8:25	3/8/2019 21:55	13.6	0.33	1.33	16,311
3/11/2019 17:40	3/12/2019 20:35	26.9	1.17	0.04	0.24	80.0	3/11/2019 17:35	3/13/2019 8:35	39.1	1.12	4.20	157,590
3/25/2019 17:00	3/26/2019 7:35	14.6	0.27	0.02	0.12	308.8	3/25/2019 17:00	3/26/2019 19:30	26.6	0.29	1.46	27,333
4/3/2019 1:20	4/3/2019 8:45	7.4	0.06	0.01	0.12	191.8	4/3/2019 1:20	4/3/2019 20:45	19.5	0.19	0.28	13,251
4/4/2019 21:25	4/5/2019 3:55	6.5	0.21	0.03	0.12	40.4	4/4/2019 21:20	4/5/2019 11:00	13.8	0.37	0.99	18,522
4/5/2019 11:00	4/5/2019 17:35	6.6	0.32	0.05	0.48	7.6	4/5/2019 11:00	4/6/2019 5:35	18.7	0.55	2.41	36,897
4/6/2019 6:05	4/6/2019 12:55	6.8	0.10	0.01	0.24	14.8	4/6/2019 6:00	4/6/2019 21:55	16.0	0.31	0.73	17,715
4/6/2019 21:55	4/7/2019 4:45	6.8	0.41	0.06	0.12	13.0	4/6/2019 21:55	4/7/2019 16:40	18.8	0.82	2.41	55,860
4/8/2019 17:15	4/9/2019 13:00	19.8	0.55	0.03	0.48	37.7	4/8/2019 17:10	4/10/2019 0:55	31.8	0.75	5.67	85,545
4/10/2019 10:35	4/11/2019 13:50	27.3	0.54	0.02	0.24	23.3	4/10/2019 10:30	4/11/2019 21:55	35.5	0.64	1.74	81,651
4/11/2019 21:55	4/12/2019 6:35	8.7	0.36	0.04	0.24	9.2	4/11/2019 21:55	4/12/2019 18:30	20.7	0.89	3.01	66,285
4/13/2019 5:30	4/13/2019 15:40	10.2	0.26	0.03	0.12	27.2	4/13/2019 5:25	4/14/2019 3:40	22.3	0.52	1.33	41,787
4/14/2019 18:55	4/14/2019 21:25	2.5	0.04	0.02	0.12	28.1	4/14/2019 18:55	4/15/2019 9:20	14.5	0.26	0.32	13,740
4/16/2019 16:55	4/16/2019 19:40	2.8	0.14	0.05	0.12	46.0	4/16/2019 16:50	4/17/2019 7:40	14.9	0.35	1.10	18,837
4/18/2019 4:55	4/18/2019 7:25	2.5	0.12	0.05	0.12	34.0	4/18/2019 4:50	4/18/2019 17:55	13.2	0.34	1.21	16,329
4/18/2019 17:55	4/18/2019 22:45	4.8	0.10	0.02	0.12	11.2	4/18/2019 17:55	4/19/2019 4:40	10.8	0.37	1.21	14,328
4/19/2019 4:40	4/19/2019 22:45	18.1	0.26	0.01	0.12	9.1	4/19/2019 4:40	4/20/2019 10:40	30.1	0.44	1.21	47,118

Table D-7. Summary Statistics for Individual Storm Events at the TOSMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
4/22/2019 11:00	4/22/2019 17:20	6.3	0.22	0.03	0.24	64.7	4/22/2019 11:00	4/23/2019 5:15	18.3	0.39	1.33	25,998
5/14/2019 8:05	5/14/2019 14:50	6.8	0.06	0.01	0.12	519.4	5/14/2019 8:00	5/15/2019 2:45	18.8	0.19	0.28	12,927
5/15/2019 15:45	5/15/2019 19:45	4.0	0.10	0.03	0.12	30.6	5/15/2019 15:40	5/16/2019 7:40	16.1	0.24	0.40	13,830
5/16/2019 13:35	5/17/2019 7:15	17.7	0.78	0.04	0.24	19.2	5/16/2019 13:30	5/17/2019 19:15	29.8	0.75	3.01	80,448
5/20/2019 9:35	5/20/2019 22:45	13.2	0.43	0.03	0.12	77.3	5/20/2019 9:30	5/21/2019 10:40	25.3	0.36	1.46	32,994
5/25/2019 11:10	5/25/2019 17:00	5.8	0.24	0.04	0.12	110.2	5/25/2019 11:10	5/26/2019 5:00	17.9	0.31	0.80	19,842
6/6/2019 14:40	6/6/2019 18:25	3.8	0.19	0.05	0.48	286.8	6/6/2019 14:35	6/7/2019 6:20	15.8	0.23	1.10	13,257
6/19/2019 15:45	6/20/2019 3:00	11.3	0.59	0.05	0.36	310.2	6/19/2019 15:40	6/20/2019 14:55	23.3	0.44	2.41	37,167
6/23/2019 5:50	6/23/2019 7:25	1.6	0.05	0.03	0.12	76.2	6/23/2019 5:50	6/23/2019 19:25	13.7	0.13	0.24	6,600
6/24/2019 0:25	6/24/2019 3:40	3.3	0.06	0.02	0.12	18.2	6/24/2019 0:20	6/24/2019 15:40	15.4	0.17	0.36	9,414
6/27/2019 2:00	6/27/2019 6:30	4.5	0.06	0.01	0.12	72.7	6/27/2019 2:00	6/27/2019 18:30	16.6	0.15	0.45	8,856
7/2/2019 12:40	7/2/2019 21:05	8.4	0.08	0.01	0.12	130.3	7/2/2019 12:40	7/3/2019 1:50	13.3	0.18	0.67	8,757
7/3/2019 1:55	7/3/2019 7:50	5.9	0.10	0.02	0.12	13.2	7/3/2019 1:50	7/3/2019 19:50	18.1	0.23	0.61	15,021
7/7/2019 20:25	7/7/2019 22:05	1.7	0.08	0.05	0.12	112.8	7/7/2019 20:25	7/8/2019 10:05	13.8	0.24	0.50	12,003
7/9/2019 20:50	7/10/2019 18:10	21.3	0.30	0.01	0.12	47.6	7/9/2019 20:45	7/11/2019 6:10	33.5	0.25	0.89	30,648
7/15/2019 9:35	7/15/2019 12:10	2.6	0.05	0.02	0.12	115.0	7/15/2019 9:30	7/16/2019 0:10	14.8	0.16	0.24	8,523
7/16/2019 2:30	7/16/2019 4:45	2.3	0.29	0.13	0.84	15.3	7/16/2019 2:30	7/16/2019 16:40	14.3	0.49	1.60	24,945
7/17/2019 5:20	7/17/2019 11:40	6.3	0.10	0.02	0.24	25.0	7/17/2019 5:15	7/17/2019 13:40	8.5	0.25	0.45	7,737
7/17/2019 13:45	7/17/2019 15:45	2.0	0.04	0.02	0.12	6.8	7/17/2019 13:40	7/17/2019 22:05	8.5	0.20	0.28	6,018
7/17/2019 22:05	7/18/2019 2:00	3.9	0.16	0.04	0.36	8.3	7/17/2019 22:05	7/18/2019 14:00	16.0	0.32	0.99	18,498
7/18/2019 17:50	7/19/2019 4:35	10.8	0.65	0.06	0.48	17.5	7/18/2019 17:50	7/19/2019 16:30	22.8	0.73	2.23	59,772
8/2/2019 2:55	8/2/2019 4:35	1.7	0.28	0.17	0.48	338.7	8/2/2019 2:55	8/2/2019 16:30	13.7	0.41	1.90	20,127
8/10/2019 3:55	8/10/2019 8:40	4.8	0.72	0.15	0.48	191.9	8/10/2019 3:55	8/10/2019 20:35	16.8	0.97	4.20	58,554
8/11/2019 7:25	8/11/2019 8:15	0.8	0.10	0.12	0.24	23.2	8/11/2019 7:25	8/11/2019 20:10	12.8	0.26	0.99	12,138
8/21/2019 5:15	8/21/2019 8:25	3.2	0.11	0.03	0.24	237.4	8/21/2019 5:10	8/21/2019 16:05	11.0	0.23	0.80	9,063
8/21/2019 16:05	8/21/2019 21:20	5.3	0.11	0.02	0.24	8.4	8/21/2019 16:05	8/22/2019 9:20	17.3	0.21	0.40	13,044
8/29/2019 18:00	8/29/2019 23:30	5.5	0.24	0.04	0.36	189.7	8/29/2019 17:55	8/30/2019 11:25	17.6	0.25	0.99	15,672
9/7/2019 19:35	9/7/2019 22:05	2.5	0.56	0.22	0.84	212.7	9/7/2019 19:30	9/8/2019 5:35	10.2	1.01	3.01	37,068
9/8/2019 5:35	9/8/2019 9:55	4.3	0.07	0.02	0.12	8.5	9/8/2019 5:35	9/8/2019 14:55	9.4	0.29	0.61	9,915
9/8/2019 14:55	9/8/2019 15:05	0.2	0.07	0.42	0.60	8.4	9/8/2019 14:55	9/8/2019 21:10	6.3	0.24	0.61	5,574
9/8/2019 21:15	9/9/2019 18:15	21.0	0.99	0.05	1.08	6.2	9/8/2019 21:10	9/10/2019 6:10	33.1	0.59	3.01	70,554
9/12/2019 19:50	9/12/2019 22:10	2.3	0.28	0.12	0.72	74.1	9/12/2019 19:50	9/13/2019 10:05	14.3	0.55	2.80	28,560
9/14/2019 20:05	9/15/2019 11:05	15.0	0.64	0.04	0.24	46.3	9/14/2019 20:00	9/15/2019 23:00	27.1	0.64	2.23	62,265
9/16/2019 17:15	9/16/2019 19:15	2.0	0.03	0.02	0.12	31.0	9/16/2019 17:10	9/17/2019 2:45	9.7	0.25	0.36	8,646
9/17/2019 2:45	9/18/2019 5:05	26.3	0.72	0.03	0.60	40.5	9/17/2019 2:45	9/18/2019 17:00	38.3	0.62	2.23	85,485
9/22/2019 6:10	9/22/2019 23:20	17.2	0.38	0.02	0.24	97.8	9/22/2019 6:10	9/23/2019 11:00	28.9	0.42	1.10	43,851
9/23/2019 11:00	9/23/2019 16:30	5.5	0.09	0.02	0.12	14.3	9/23/2019 11:00	9/24/2019 4:25	17.5	0.30	0.67	19,188
9/26/2019 5:15	9/26/2019 8:00	2.8	0.11	0.04	0.12	63.3	9/26/2019 5:10	9/26/2019 20:00	14.9	0.28	0.56	14,901
9/27/2019 1:55	9/27/2019 5:40	3.8	0.40	0.11	0.48	18.8	9/27/2019 1:50	9/27/2019 13:25	11.7	1.00	3.45	42,183
9/27/2019 13:25	9/28/2019 1:00	11.6	0.19	0.02	0.36	8.5	9/27/2019 13:25	9/28/2019 13:00	23.7	0.47	1.90	40,206
9/29/2019 1:15	9/29/2019 4:25	3.2	0.04	0.01	0.12	31.2	9/29/2019 1:15	9/29/2019 16:25	15.3	0.28	0.36	15,336

Table D-8. Summary Statistics for Individual Storm Events at the COLM Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
10/1/2018 7:55	10/1/2018 20:35	12.7	0.49	0.04	0.24	14.1						-
10/2/2018 15:10	10/2/2018 17:20	2.2	0.06	0.03	0.24	19.0						-
10/5/2018 9:05	10/5/2018 18:15	9.2	0.52	0.06	0.24	64.4	10/5/2018 18:50	10/5/2018 21:40	2.9	0.01	0.01	105
10/8/2018 1:35	10/8/2018 5:15	3.7	0.03	0.01	0.12	55.8						-
10/8/2018 10:20	10/9/2018 7:10	20.8	0.66	0.03	0.24	64.6	10/8/2018 16:10	10/9/2018 19:05	27.0	0.08	0.22	7,941
10/23/2018 18:00	10/23/2018 19:00	1.0	0.04	0.04	0.12	347.8						-
10/25/2018 6:35	10/26/2018 9:10	26.6	0.82	0.03	0.24	36.6	10/25/2018 14:00	10/26/2018 21:10	31.3	0.18	0.30	20,487
10/27/2018 15:25	10/28/2018 6:40	15.3	1.22	0.08	0.36	30.8	10/27/2018 15:20	10/28/2018 17:00	25.8	0.37	0.57	34,452
10/28/2018 17:05	10/28/2018 22:00	4.9	0.10	0.02	0.12	10.8	10/28/2018 17:00	10/29/2018 9:55	17.0	0.38	0.41	23,088
10/29/2018 14:10	10/29/2018 14:25	0.3	0.07	0.28	0.24	16.6	10/29/2018 14:10	10/30/2018 2:25	12.3	0.32	0.33	14,229
10/30/2018 19:50	10/31/2018 2:15	6.4	0.17	0.03	0.12	29.5	10/30/2018 19:50	10/31/2018 14:10	18.4	0.41	0.44	27,030
10/31/2018 15:20	11/1/2018 10:30	19.2	0.44	0.02	0.24	17.2	10/31/2018 15:20	11/1/2018 22:30	31.3	0.51	0.61	57,609
11/1/2018 23:35	11/2/2018 20:45	21.2	1.29	0.06	3.12	14.1	11/1/2018 23:35	11/3/2018 8:45	33.3	1.08	1.32	129,240
11/3/2018 8:55	11/4/2018 0:30	15.6	0.28	0.02	0.12	16.3	11/3/2018 8:55	11/4/2018 4:15	19.4	1.28	1.32	89,433
11/4/2018 4:20	11/4/2018 5:50	1.5	0.08	0.05	0.12	9.8	11/4/2018 4:15	11/4/2018 15:10	11.0	1.28	1.32	50,865
11/4/2018 15:15	11/4/2018 22:05	6.8	0.10	0.01	0.24	10.5	11/4/2018 15:10	11/5/2018 10:05	19.0	1.23	1.25	84,366
11/5/2018 18:15	11/5/2018 23:40	5.4	0.03	0.01	0.12	25.1	11/5/2018 18:10	11/6/2018 11:35	17.5	1.10	1.18	69,363
11/9/2018 9:40	11/9/2018 12:05	2.4	0.08	0.03	0.12	112.5	11/9/2018 9:40	11/10/2018 0:00	14.4	0.84	0.88	43,557
11/14/2018 5:30	11/14/2018 8:30	3.0	0.08	0.03	0.12	114.6	11/14/2018 5:25	11/14/2018 20:25	15.1	0.74	0.74	40,077
11/15/2018 20:45	11/16/2018 6:00	9.3	0.20	0.02	0.12	36.8	11/15/2018 20:45	11/16/2018 17:55	21.3	0.79	0.83	60,813
11/21/2018 21:45	11/23/2018 19:40	45.9	1.26	0.03	0.72	139.1	11/21/2018 21:40	11/24/2018 7:40	58.1	0.91	1.11	189,902
11/26/2018 4:30	11/27/2018 6:20	25.8	1.20	0.05	0.24	62.0	11/26/2018 4:25	11/27/2018 14:55	34.6	1.35	1.99	167,667
11/27/2018 14:55	11/27/2018 20:30	5.6	0.44	0.08	0.60	9.0	11/27/2018 14:55	11/28/2018 2:35	11.8	1.74	1.99	73,647
11/28/2018 2:35	11/28/2018 18:00	15.4	0.28	0.02	0.36	7.0	11/28/2018 2:35	11/29/2018 5:55	27.4	1.67	1.89	164,502
11/30/2018 2:25	11/30/2018 6:05	3.7	0.06	0.02	0.12	35.2	11/30/2018 2:25	11/30/2018 18:00	15.7	1.05	1.11	59,382
11/30/2018 19:35	11/30/2018 22:10	2.6	0.14	0.05	0.12	15.3	11/30/2018 19:30	12/1/2018 9:55	14.5	1.05	1.11	54,972
12/1/2018 9:55	12/1/2018 12:35	2.7	0.05	0.02	0.12	12.3	12/1/2018 9:55	12/2/2018 0:30	14.7	0.94	0.99	49,710
12/9/2018 8:25	12/9/2018 22:55	14.5	0.73	0.05	0.12	190.2	12/9/2018 8:25	12/10/2018 10:50	26.5	0.50	0.57	47,712
12/10/2018 11:10	12/10/2018 11:15	0.1	0.03	0.36	0.24	14.8	12/10/2018 11:10	12/10/2018 23:10	12.1	0.57	0.57	24,795
12/11/2018 3:35	12/12/2018 0:40	21.1	0.57	0.03	0.48	31.2	12/11/2018 3:30	12/12/2018 12:40	33.3	0.75	0.88	90,321
12/12/2018 21:15	12/13/2018 17:00	19.8	0.13	0.01	0.12	24.6	12/12/2018 21:10	12/14/2018 5:00	31.9	0.83	0.88	94,992
12/15/2018 22:50	12/16/2018 7:15	8.4	0.33	0.04	0.12	65.2	12/15/2018 22:50	12/16/2018 13:25	14.7	0.69	0.83	36,341
12/16/2018 13:25	12/16/2018 21:50	8.4	0.22	0.03	0.24	8.3	12/16/2018 13:25	12/17/2018 5:25	16.1	0.46	0.62	26,638
12/17/2018 5:30	12/17/2018 6:05	0.6	0.03	0.05	0.12	7.8	12/17/2018 5:25	12/17/2018 17:10	11.8	0.38	0.46	16,028
12/17/2018 17:15	12/18/2018 8:10	14.9	0.52	0.03	0.24	19.6	12/17/2018 17:10	12/18/2018 13:30	20.4	0.76	0.98	55,930
12/18/2018 13:35	12/19/2018 0:15	10.7	0.28	0.03	0.36	7.3	12/18/2018 13:30	12/19/2018 12:10	22.8	0.90	1.10	73,736
12/19/2018 23:30	12/20/2018 11:10	11.7	0.23	0.02	0.24	29.0	12/19/2018 23:25	12/20/2018 23:10	23.8	0.64	0.78	54,604
12/22/2018 18:05	12/23/2018 14:20	20.3	0.80	0.04	0.36	55.3	12/22/2018 18:00	12/24/2018 2:20	32.4	0.88	1.21	102,706
12/26/2018 9:35	12/26/2018 12:25	2.8	0.07	0.02	0.12	68.4	12/26/2018 9:30	12/26/2018 23:25	14.0	0.45	0.46	22,817
12/26/2018 23:25	12/27/2018 0:15	0.8	0.04	0.05	0.12	12.5	12/26/2018 23:25	12/27/2018 12:10	12.8	0.36	0.46	16,407
12/28/2018 5:35	12/28/2018 21:40	16.1	0.82	0.05	0.12	30.2	12/28/2018 5:35	12/29/2018 9:40	28.2	1.03	1.46	104,702
12/29/2018 12:20	12/30/2018 2:35	14.3	1.12	0.08	0.48	15.3	12/29/2018 12:20	12/30/2018 14:35	26.3	2.69	3.56	255,276
12/30/2018 15:00	12/30/2018 15:35	0.6	0.11	0.19	0.24	12.8	12/30/2018 14:55	12/31/2018 3:30	12.7	1.90	2.27	86,522
1/2/2019 23:55	1/4/2019 7:20	31.4	1.05	0.03	0.36	80.6	1/2/2019 23:55	1/4/2019 12:40	36.8	2.55	3.64	337,563
1/4/2019 12:45	1/4/2019 20:30	7.8	0.08	0.01	0.12	8.3	1/4/2019 12:40	1/5/2019 8:25	19.8	2.91	3.15	207,699

Table D-8. Summary Statistics for Individual Storm Events at the COLM Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
1/5/2019 22:55	1/6/2019 3:45	4.8	0.09	0.02	0.12	31.2	1/5/2019 22:50	1/6/2019 15:40	16.9	1.90	2.09	115,956
1/6/2019 17:00	1/7/2019 1:25	8.4	0.47	0.06	0.24	14.8	1/6/2019 17:00	1/7/2019 13:25	20.5	2.18	2.40	160,788
1/8/2019 9:20	1/10/2019 13:55	52.6	0.72	0.01	0.24	32.7	1/8/2019 9:20	1/11/2019 1:50	64.6	1.94	2.09	450,928
1/17/2019 2:00	1/17/2019 3:40	1.7	0.17	0.10	0.24	159.2	1/17/2019 2:00	1/17/2019 15:40	13.8	0.83	0.83	40,845
1/17/2019 16:00	1/17/2019 21:55	5.9	0.04	0.01	0.12	12.7	1/17/2019 15:55	1/18/2019 9:55	18.1	0.79	0.83	51,243
1/18/2019 18:25	1/19/2019 2:35	8.2	0.22	0.03	0.24	26.4	1/18/2019 18:20	1/19/2019 14:35	20.3	0.80	0.83	58,371
1/22/2019 13:45	1/23/2019 9:50	20.1	1.00	0.05	0.24	87.9	1/22/2019 13:40	1/23/2019 21:45	32.2	1.32	1.80	152,361
1/24/2019 4:00	1/24/2019 7:55	3.9	0.03	0.01	0.12	20.2	1/24/2019 3:55	1/24/2019 19:50	16.0	1.70	1.80	97,677
2/1/2019 4:45	2/1/2019 21:30	16.8	0.67	0.04	0.24	213.0	2/1/2019 4:40	2/2/2019 9:30	28.9	0.85	0.99	88,374
2/5/2019 11:05	2/5/2019 13:55	2.8	0.52	0.18	0.36	87.8	2/5/2019 11:00	2/6/2019 1:50	14.9	0.77	0.78	41,094
2/6/2019 11:45	2/6/2019 12:05	0.3	0.03	0.09	0.12	22.1	2/6/2019 11:45	2/7/2019 0:00	12.3	0.65	0.65	28,716
2/9/2019 15:10	2/9/2019 16:10	1.0	0.05	0.05	0.12	97.5	2/9/2019 15:10	2/10/2019 4:05	13.0	0.57	0.57	26,631
2/13/2019 12:25	2/13/2019 18:20	5.9	0.77	0.13	1.44	93.2	2/13/2019 12:20	2/14/2019 6:20	18.1	1.13	1.25	73,641
2/14/2019 10:40	2/14/2019 23:40	13.0	0.56	0.04	0.24	18.2	2/14/2019 10:40	2/15/2019 6:00	19.4	1.27	1.54	88,425
2/15/2019 6:05	2/15/2019 9:15	3.2	0.04	0.01	0.12	9.6	2/15/2019 6:00	2/15/2019 21:10	15.3	1.51	1.71	83,010
2/16/2019 9:15	2/16/2019 23:05	13.8	0.54	0.04	0.24	27.2	2/16/2019 9:10	2/17/2019 11:00	25.9	2.58	3.31	240,615
2/19/2019 13:30	2/20/2019 3:05	13.6	0.43	0.03	0.24	64.2	2/19/2019 13:25	2/20/2019 15:00	25.7	2.27	2.88	209,610
2/22/2019 10:10	2/22/2019 16:55	6.8	0.22	0.03	0.12	58.3	2/22/2019 10:10	2/23/2019 4:50	18.8	2.49	2.76	167,763
2/23/2019 12:10	2/24/2019 0:35	12.4	0.16	0.01	0.36	21.8	2/23/2019 12:10	2/24/2019 12:30	24.4	2.61	2.76	229,042
3/6/2019 13:15	3/7/2019 0:20	11.1	0.15	0.01	0.12	257.0	3/6/2019 13:15	3/7/2019 10:25	21.3	0.72	0.74	55,185
3/7/2019 10:30	3/7/2019 17:40	7.2	0.26	0.04	0.36	13.8	3/7/2019 10:25	3/8/2019 5:35	19.3	0.83	0.88	57,510
3/8/2019 8:25	3/8/2019 11:35	3.2	0.09	0.03	0.12	15.9	3/8/2019 8:25	3/8/2019 23:35	15.3	0.88	0.88	48,207
3/11/2019 17:50	3/12/2019 17:20	23.5	1.17	0.05	0.24	80.2	3/11/2019 17:45	3/12/2019 19:25	25.8	3.07	4.58	284,589
3/12/2019 19:25	3/12/2019 22:50	3.4	0.08	0.02	0.24	8.8	3/12/2019 19:25	3/13/2019 4:05	8.8	4.48	4.78	141,009
3/13/2019 4:05	3/13/2019 7:50	3.8	0.21	0.06	0.24	7.5	3/13/2019 4:05	3/13/2019 19:50	15.8	4.10	4.37	233,937
3/22/2019 19:10	3/22/2019 23:10	4.0	0.06	0.02	0.12	228.0	3/22/2019 19:05	3/23/2019 11:10	16.2	0.68	0.69	39,342
3/25/2019 17:30	3/26/2019 4:10	10.7	0.23	0.02	0.24	69.7	3/25/2019 17:25	3/26/2019 16:05	22.8	0.53	0.57	43,371
4/3/2019 3:05	4/3/2019 9:20	6.3	0.09	0.01	0.12	193.3	4/3/2019 3:00	4/3/2019 21:20	18.4	0.33	0.33	21,879
4/4/2019 23:40	4/5/2019 4:10	4.5	0.15	0.03	0.12	40.0	4/4/2019 23:35	4/5/2019 11:25	11.9	0.33	0.33	14,058
4/5/2019 11:25	4/5/2019 17:55	6.5	0.36	0.06	1.08	7.7	4/5/2019 11:25	4/6/2019 5:45	18.4	0.41	0.47	27,006
4/6/2019 5:50	4/6/2019 15:05	9.3	0.17	0.02	0.60	14.4	4/6/2019 5:45	4/6/2019 21:30	15.8	0.40	0.41	22,632
4/6/2019 21:35	4/7/2019 5:20	7.8	0.34	0.04	0.12	8.5	4/6/2019 21:30	4/7/2019 17:15	19.8	0.48	0.50	34,242
4/8/2019 17:30	4/9/2019 1:20	7.8	0.09	0.01	0.12	37.9	4/8/2019 17:25	4/9/2019 1:40	8.3	0.50	0.50	14,883
4/9/2019 1:40	4/9/2019 7:10	5.5	0.18	0.03	0.12	7.7	4/9/2019 1:40	4/9/2019 19:10	17.6	0.63	0.69	40,155
4/9/2019 19:45	4/10/2019 1:40	5.9	0.07	0.01	0.24	14.8	4/9/2019 19:40	4/10/2019 10:15	14.7	0.69	0.69	36,420
4/10/2019 10:20	4/12/2019 6:55	44.6	0.80	0.02	0.24	10.0	4/10/2019 10:15	4/12/2019 18:55	56.8	1.14	1.80	233,436
4/13/2019 5:35	4/13/2019 15:10	9.6	0.27	0.03	0.12	27.3	4/13/2019 5:35	4/14/2019 3:10	21.7	1.48	1.63	115,086
4/14/2019 19:20	4/14/2019 21:45	2.4	0.05	0.02	0.12	32.3	4/14/2019 19:20	4/15/2019 9:40	14.4	1.01	1.05	52,395
4/16/2019 16:55	4/16/2019 20:10	3.3	0.14	0.04	0.12	45.2	4/16/2019 16:50	4/17/2019 8:10	15.4	0.75	0.78	41,754
4/18/2019 4:55	4/18/2019 7:05	2.2	0.11	0.05	0.12	34.1	4/18/2019 4:50	4/18/2019 17:50	13.1	0.65	0.69	30,663
4/18/2019 17:50	4/18/2019 19:50	2.0	0.09	0.05	0.12	11.1	4/18/2019 17:50	4/19/2019 4:05	10.3	0.68	0.69	25,128
4/19/2019 4:05	4/19/2019 22:35	18.5	0.29	0.02	0.12	8.7	4/19/2019 4:05	4/20/2019 10:30	30.5	0.73	0.78	80,610
4/22/2019 11:40	4/22/2019 17:50	6.2	0.31	0.05	0.24	67.7	4/22/2019 11:35	4/23/2019 5:45	18.3	0.67	0.74	43,761
4/27/2019 5:45	4/27/2019 6:50	1.1	0.04	0.04	0.12	108.7	4/27/2019 5:45	4/27/2019 18:45	13.1	0.44	0.44	20,724
5/14/2019 9:10	5/14/2019 14:55	5.8	0.06	0.01	0.36	411.4	5/14/2019 9:10	5/15/2019 2:55	17.8	0.22	0.22	13,809
5/15/2019 16:25	5/15/2019 19:10	2.8	0.08	0.03	0.12	25.6	5/15/2019 16:25	5/16/2019 7:05	14.8	0.22	0.22	11,682

Table D-8. Summary Statistics for Individual Storm Events at the COLM Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume ($feet^3$)
5/16/2019 13:45	5/17/2019 9:20	19.6	1.05	0.05	0.36	20.3	5/16/2019 13:40	5/17/2019 21:20	31.8	0.36	0.50	41,193
5/20/2019 8:35	5/21/2019 0:25	15.8	0.25	0.02	0.24	75.3	5/20/2019 8:35	5/21/2019 12:20	27.8	0.29	0.30	28,746
5/24/2019 8:45	5/24/2019 11:30	2.8	0.08	0.03	0.12	83.8	5/24/2019 8:45	5/24/2019 23:25	14.8	0.22	0.24	11,874
5/25/2019 11:55	5/25/2019 16:45	4.8	0.15	0.03	0.12	25.2	5/25/2019 11:55	5/26/2019 4:40	16.8	0.24	0.24	14,292
6/6/2019 15:50	6/6/2019 18:20	2.5	0.17	0.07	1.08	288.3	6/6/2019 15:45	6/7/2019 5:10	13.5	0.05	0.07	2,652
6/7/2019 5:10	6/7/2019 17:50	12.7	0.10	0.01	0.24	12.0	6/7/2019 5:10	6/8/2019 5:45	24.7	0.02	0.07	2,106
6/19/2019 18:50	6/20/2019 2:40	7.8	0.42	0.05	0.36	294.2	6/19/2019 18:45	6/20/2019 14:40	20.0	0.04	0.22	3,177
6/23/2019 6:25	6/23/2019 10:50	4.4	0.10	0.02	0.12	76.9	6/23/2019 6:20	6/23/2019 22:40	16.4	0.02	0.02	1,089
6/23/2019 22:45	6/24/2019 2:50	4.1	0.03	0.01	0.12	13.4	6/23/2019 22:40	6/24/2019 14:45	16.2	0.02	0.02	1,011
6/26/2019 14:45	6/26/2019 15:20	0.6	0.04	0.07	0.12	77.4	6/26/2019 14:45	6/27/2019 0:45	10.1	0.01	0.02	369
6/27/2019 0:50	6/27/2019 12:10	11.3	0.18	0.02	0.48	10.1	6/27/2019 0:45	6/28/2019 0:10	23.5	0.02	0.02	1,449
7/2/2019 11:55	7/2/2019 18:45	6.8	0.20	0.03	0.60	129.7	7/2/2019 11:55	7/3/2019 2:45	14.9	0.01	0.02	600
7/3/2019 2:50	7/3/2019 10:05	7.3	0.06	0.01	0.12	14.4	7/3/2019 2:45	7/3/2019 22:05	19.4	0.01	0.01	699
7/9/2019 21:35	7/10/2019 18:55	21.3	0.32	0.02	0.48	159.0	7/9/2019 22:15	7/11/2019 6:55	32.7	0.01	0.01	1,176
7/17/2019 5:40	7/17/2019 11:55	6.3	0.11	0.02	0.24	154.8	7/17/2019 5:40	7/17/2019 14:25	8.8	0.01	0.01	318
7/17/2019 14:25	7/17/2019 14:30	0.1	0.03	0.36	0.24	7.2	7/17/2019 14:25	7/17/2019 21:40	7.3	0.01	0.01	264
7/17/2019 21:40	7/18/2019 7:30	9.8	0.29	0.03	0.24	9.8	7/17/2019 21:40	7/18/2019 19:25	21.8	0.01	0.02	939
7/18/2019 19:30	7/19/2019 0:30	5.0	0.19	0.04	0.12	13.8	7/18/2019 19:25	7/19/2019 12:30	17.2	0.01	0.02	711
7/27/2019 4:50	7/27/2019 7:20	2.5	0.10	0.04	0.36	198.0						-
8/2/2019 3:10	8/2/2019 4:30	1.3	0.27	0.20	0.36	140.8	8/2/2019 4:40	8/2/2019 8:55	4.3	0.01	0.02	186
8/10/2019 3:50	8/10/2019 8:20	4.5	0.59	0.13	0.36	191.7	8/10/2019 7:15	8/10/2019 20:15	13.1	0.03	0.22	1,503
8/21/2019 5:30	8/21/2019 9:55	4.4	0.11	0.02	0.36	261.6						-
8/21/2019 16:10	8/21/2019 22:10	6.0	0.08	0.01	0.24	8.3						-
8/29/2019 18:15	8/29/2019 23:45	5.5	0.17	0.03	0.24	188.8						-
9/7/2019 19:40	9/7/2019 21:55	2.3	0.40	0.18	0.36	215.7						-
9/8/2019 5:15	9/8/2019 8:35	3.3	0.06	0.02	0.12	8.0						-
9/8/2019 15:15	9/8/2019 16:40	1.4	0.89	0.63	3.36	8.8	9/8/2019 16:10	9/8/2019 18:30	2.4	0.02	0.07	201
9/9/2019 2:25	9/9/2019 18:20	15.9	1.13	0.07	1.80	10.8	9/9/2019 3:10	9/10/2019 6:20	27.3	0.05	0.30	4,767
9/12/2019 20:00	9/12/2019 22:20	2.3	0.20	0.09	0.24	74.0						-
9/14/2019 20:20	9/15/2019 12:40	16.3	0.88	0.05	0.48	46.4	9/14/2019 22:50	9/16/2019 0:40	25.9	0.04	0.07	3,450
9/16/2019 23:55	9/17/2019 4:05	4.2	0.03	0.01	0.12	37.3	9/16/2019 23:55	9/17/2019 7:05	7.3	0.01	0.01	261
9/17/2019 7:05	9/18/2019 1:25	18.3	0.74	0.04	1.44	44.5	9/17/2019 7:05	9/18/2019 13:25	30.4	0.18	0.28	19,875
9/22/2019 6:20	9/23/2019 2:20	20.0	0.51	0.03	0.24	105.2	9/22/2019 6:20	9/23/2019 11:10	28.9	0.12	0.26	12,666
9/23/2019 11:10	9/23/2019 17:00	5.8	0.09	0.02	0.12	10.7	9/23/2019 11:10	9/24/2019 0:20	13.3	0.14	0.22	6,489
9/24/2019 0:25	9/24/2019 9:20	8.9	0.22	0.02	0.36	10.8	9/24/2019 0:20	9/24/2019 21:20	21.1	0.12	0.24	9,471
9/26/2019 4:40	9/26/2019 10:20	5.7	0.29	0.05	0.24	43.6	9/26/2019 4:40	9/26/2019 22:20	17.8	0.22	0.28	14,031
9/27/2019 2:05	9/27/2019 5:20	3.3	0.06	0.02	0.12	18.8	9/27/2019 2:00	9/27/2019 10:40	8.8	0.21	0.22	6,660
9/27/2019 10:40	9/27/2019 19:40	9.0	0.39	0.04	0.84	7.9	9/27/2019 10:40	9/28/2019 7:40	21.1	0.37	0.47	27,933
9/29/2019 1:05	9/29/2019 5:55	4.8	0.04	0.01	0.24	30.8	9/29/2019 1:05	9/29/2019 17:55	16.9	0.30	0.33	18,297

Table D-9. Summary Statistics for Individual Storm Events at the SEIMN Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 7:55	10/1/2018 20:35	12.7	0.49	0.04	0.24	14.1	10/1/2018 7:50	10/2/2018 8:35	24.8	0.15	0.35	13,542
10/2/2018 15:10	10/2/2018 17:20	2.2	0.06	0.03	0.24	19.0	10/2/2018 15:10	10/3/2018 5:15	14.2	0.10	0.13	5,226
10/5/2018 9:05	10/5/2018 18:15	9.2	0.52	0.06	0.24	64.4	10/5/2018 9:00	10/6/2018 6:10	21.3	0.17	0.29	13,032
10/8/2018 1:35	10/8/2018 5:15	3.7	0.03	0.01	0.12	55.8	10/8/2018 1:30	10/8/2018 10:15	8.8	0.10	0.10	3,180
10/8/2018 10:20	10/9/2018 7:10	20.8	0.66	0.03	0.24	64.6	10/8/2018 10:15	10/9/2018 19:05	32.9	0.19	0.35	22,356
10/23/2018 18:00	10/23/2018 19:00	1.0	0.04	0.04	0.12	347.8	10/23/2018 17:55	10/24/2018 6:55	13.1	0.08	0.10	3,930
10/25/2018 6:35	10/26/2018 9:10	26.6	0.82	0.03	0.24	36.6	10/25/2018 6:30	10/26/2018 21:10	38.8	0.13	0.29	18,318
10/27/2018 15:25	10/28/2018 6:40	15.3	1.22	0.08	0.36	30.8	10/27/2018 15:20	10/28/2018 17:00	25.8	0.25	0.58	22,845
10/28/2018 17:05	10/28/2018 22:00	4.9	0.10	0.02	0.12	10.8	10/28/2018 17:00	10/29/2018 9:55	17.0	0.14	0.16	8,847
10/29/2018 14:10	10/29/2018 14:25	0.3	0.07	0.28	0.24	16.6	10/29/2018 14:10	10/30/2018 2:25	12.3	0.16	0.20	7,296
10/30/2018 19:50	10/31/2018 2:15	6.4	0.17	0.03	0.12	29.5	10/30/2018 19:50	10/31/2018 14:10	18.4	0.17	0.24	11,184
10/31/2018 15:20	11/1/2018 10:30	19.2	0.44	0.02	0.24	17.2	10/31/2018 15:20	11/1/2018 22:30	31.3	0.18	0.35	20,112
11/1/2018 23:35	11/2/2018 20:45	21.2	1.29	0.06	3.12	14.1	11/1/2018 23:35	11/3/2018 8:45	33.3	0.31	0.73	37,341
11/3/2018 8:55	11/4/2018 0:30	15.6	0.28	0.02	0.12	16.3	11/3/2018 8:55	11/4/2018 4:15	19.4	0.30	0.42	21,024
11/4/2018 4:20	11/4/2018 5:50	1.5	0.08	0.05	0.12	9.8	11/4/2018 4:15	11/4/2018 15:10	11.0	0.25	0.29	10,044
11/4/2018 15:15	11/4/2018 22:05	6.8	0.10	0.01	0.24	10.5	11/4/2018 15:10	11/5/2018 10:05	19.0	0.21	0.24	14,508
11/5/2018 18:15	11/5/2018 23:40	5.4	0.03	0.01	0.12	25.1	11/5/2018 18:10	11/6/2018 11:35	17.5	0.17	0.20	10,476
11/9/2018 9:40	11/9/2018 12:05	2.4	0.08	0.03	0.12	112.5	11/9/2018 9:40	11/10/2018 0:00	14.4	0.16	0.16	8,304
11/14/2018 5:30	11/14/2018 8:30	3.0	0.08	0.03	0.12	114.6	11/14/2018 5:25	11/14/2018 20:25	15.1	0.16	0.16	8,688
11/15/2018 20:45	11/16/2018 6:00	9.3	0.20	0.02	0.12	36.8	11/15/2018 20:45	11/16/2018 17:55	21.3	0.18	0.24	13,656
11/21/2018 21:45	11/23/2018 19:40	45.9	1.26	0.03	0.72	139.1	11/21/2018 21:40	11/24/2018 7:40	58.1	0.34	0.63	70,371
11/26/2018 4:30	11/27/2018 6:20	25.8	1.20	0.05	0.24	62.0	11/26/2018 4:25	11/27/2018 14:55	34.6	0.65	1.17	81,201
11/27/2018 14:55	11/27/2018 20:30	5.6	0.44	0.08	0.60	9.0	11/27/2018 14:55	11/28/2018 2:35	11.8	0.83	0.91	35,235
11/28/2018 2:35	11/28/2018 18:00	15.4	0.28	0.02	0.36	7.0	11/28/2018 2:35	11/29/2018 6:00	27.5	0.67	0.85	66,657
11/30/2018 2:25	11/30/2018 6:05	3.7	0.06	0.02	0.12	35.2	11/30/2018 2:25	11/30/2018 18:00	15.7	0.37	0.42	20,685
11/30/2018 19:35	11/30/2018 22:10	2.6	0.14	0.05	0.12	15.3	11/30/2018 19:30	12/1/2018 9:55	14.5	0.39	0.49	20,601
12/1/2018 9:55	12/1/2018 12:35	2.7	0.05	0.02	0.12	12.3	12/1/2018 9:55	12/2/2018 0:30	14.7	0.36	0.42	19,005
12/9/2018 8:25	12/9/2018 22:55	14.5	0.73	0.05	0.12	190.2	12/9/2018 8:25	12/10/2018 10:50	26.5	0.42	0.58	39,783
12/10/2018 11:10	12/10/2018 11:15	0.1	0.03	0.36	0.24	14.8	12/10/2018 11:10	12/10/2018 23:10	12.1	0.35	0.35	15,225
12/11/2018 3:35	12/12/2018 0:40	21.1	0.57	0.03	0.48	31.2	12/11/2018 3:30	12/12/2018 12:40	33.3	0.49	0.68	58,566
12/12/2018 21:15	12/13/2018 17:00	19.8	0.13	0.01	0.12	24.6	12/12/2018 21:10	12/14/2018 5:00	31.9	0.38	0.49	43,296
12/15/2018 22:50	12/16/2018 7:15	8.4	0.33	0.04	0.12	65.2	12/15/2018 22:50	12/16/2018 13:25	14.7	0.33	0.42	17,475
12/16/2018 13:25	12/16/2018 21:50	8.4	0.22	0.03	0.24	8.3	12/16/2018 13:25	12/17/2018 5:25	16.1	0.35	0.42	20,286
12/17/2018 5:30	12/17/2018 6:05	0.6	0.03	0.05	0.12	7.8	12/17/2018 5:25	12/17/2018 17:10	11.8	0.31	0.35	13,290
12/17/2018 17:15	12/18/2018 8:10	14.9	0.52	0.03	0.24	19.6	12/17/2018 17:10	12/18/2018 13:30	20.4	0.49	0.58	35,724
12/18/2018 13:35	12/19/2018 0:15	10.7	0.28	0.03	0.36	7.3	12/18/2018 13:30	12/19/2018 12:10	22.8	0.54	0.63	44,436
12/19/2018 23:30	12/20/2018 11:10	11.7	0.23	0.02	0.24	29.0	12/19/2018 23:30	12/20/2018 23:10	23.8	0.43	0.49	36,414
12/22/2018 18:05	12/23/2018 14:20	20.3	0.80	0.04	0.36	55.3	12/22/2018 18:00	12/24/2018 2:20	32.4	0.54	0.68	62,640
12/26/2018 9:35	12/26/2018 12:25	2.8	0.07	0.02	0.12	68.4	12/26/2018 9:30	12/26/2018 23:25	14.0	0.35	0.35	17,478
12/26/2018 23:25	12/27/2018 0:15	0.8	0.04	0.05	0.12	12.5	12/26/2018 23:25	12/27/2018 12:10	12.8	0.30	0.35	14,010
12/28/2018 5:35	12/28/2018 21:40	16.1	0.82	0.05	0.12	30.2	12/28/2018 5:35	12/29/2018 9:40	28.2	0.61	0.79	61,356
12/29/2018 12:20	12/30/2018 2:35	14.3	1.12	0.08	0.48	15.3	12/29/2018 12:20	12/30/2018 14:35	26.3	1.33	1.71	126,204

Table D-9. Summary Statistics for Individual Storm Events at the SEIMN Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
12/30/2018 15:00	12/30/2018 15:35	0.6	0.11	0.19	0.24	12.8	12/30/2018 15:00	12/31/2018 3:30	12.6	0.90	1.10	40,578
1/2/2019 23:55	1/4/2019 7:20	31.4	1.05	0.03	0.36	80.6	1/2/2019 23:55	1/4/2019 12:40	36.8	0.92	1.63	122,487
1/4/2019 12:45	1/4/2019 20:30	7.8	0.08	0.01	0.12	8.3	1/4/2019 12:40	1/5/2019 8:25	19.8	0.85	0.97	60,600
1/5/2019 22:55	1/6/2019 3:45	4.8	0.09	0.02	0.12	31.2	1/5/2019 22:50	1/6/2019 15:40	16.9	0.70	0.79	42,630
1/6/2019 17:00	1/7/2019 1:25	8.4	0.47	0.06	0.24	14.8	1/6/2019 17:00	1/7/2019 13:25	20.5	0.79	0.85	58,122
1/8/2019 9:20	1/10/2019 13:55	52.6	0.72	0.01	0.24	32.7	1/8/2019 9:20	1/11/2019 1:50	64.6	0.72	0.79	167,995
1/17/2019 2:00	1/17/2019 3:40	1.7	0.17	0.10	0.24	159.2	1/17/2019 2:00	1/17/2019 15:40	13.8	0.43	0.49	21,168
1/17/2019 16:00	1/17/2019 21:55	5.9	0.04	0.01	0.12	12.7	1/17/2019 16:00	1/18/2019 9:55	18.0	0.42	0.42	27,216
1/18/2019 18:25	1/19/2019 2:35	8.2	0.22	0.03	0.24	26.4	1/18/2019 18:20	1/19/2019 14:35	20.3	0.42	0.49	30,933
1/22/2019 13:45	1/23/2019 9:50	20.1	1.00	0.05	0.24	87.9	1/22/2019 13:40	1/23/2019 21:45	32.2	0.67	0.85	78,099
1/24/2019 4:00	1/24/2019 7:55	3.9	0.03	0.01	0.12	20.2	1/24/2019 4:00	1/24/2019 19:50	15.9	0.56	0.63	31,905
2/1/2019 4:45	2/1/2019 21:30	16.8	0.67	0.04	0.24	213.0	2/1/2019 4:40	2/2/2019 9:30	28.9	0.54	0.63	55,959
2/5/2019 11:05	2/5/2019 13:55	2.8	0.52	0.18	0.36	87.8	2/5/2019 11:00	2/6/2019 1:50	14.9	0.42	0.42	22,554
2/6/2019 11:45	2/6/2019 12:05	0.3	0.03	0.09	0.12	22.1	2/6/2019 11:45	2/7/2019 0:00	12.3	0.42	0.42	18,648
2/9/2019 15:10	2/9/2019 16:10	1.0	0.05	0.05	0.12	97.5	2/9/2019 15:10	2/10/2019 4:10	13.1	0.45	0.49	21,336
2/13/2019 12:25	2/13/2019 18:20	5.9	0.77	0.13	1.44	93.2	2/13/2019 12:20	2/14/2019 6:20	18.1	0.49	0.49	31,899
2/14/2019 10:40	2/14/2019 23:40	13.0	0.56	0.04	0.24	18.2	2/14/2019 10:40	2/15/2019 6:00	19.4	0.54	0.58	37,758
2/15/2019 6:05	2/15/2019 9:15	3.2	0.04	0.01	0.12	9.6	2/15/2019 6:00	2/15/2019 21:10	15.3	0.58	0.63	32,007
2/16/2019 9:15	2/16/2019 23:05	13.8	0.54	0.04	0.24	27.2	2/16/2019 9:10	2/17/2019 11:00	25.9	0.67	0.79	62,388
2/19/2019 13:30	2/20/2019 3:05	13.6	0.43	0.03	0.24	64.2	2/19/2019 13:25	2/20/2019 15:00	25.7	0.70	0.85	65,118
2/22/2019 10:10	2/22/2019 16:55	6.8	0.22	0.03	0.12	58.3	2/22/2019 10:05	2/23/2019 4:50	18.8	0.59	0.63	40,329
2/23/2019 12:10	2/24/2019 0:35	12.4	0.16	0.01	0.36	21.8	2/23/2019 12:10	2/24/2019 12:30	24.4	0.63	0.68	54,942
3/6/2019 13:15	3/7/2019 0:20	11.1	0.15	0.01	0.12	257.0	3/6/2019 13:15	3/7/2019 10:25	21.3	0.49	0.49	37,485
3/7/2019 10:30	3/7/2019 17:40	7.2	0.26	0.04	0.36	13.8	3/7/2019 10:25	3/8/2019 5:35	19.3	0.49	0.53	34,017
3/8/2019 8:25	3/8/2019 11:35	3.2	0.09	0.03	0.12	15.9	3/8/2019 8:25	3/8/2019 23:35	15.3	0.51	0.53	27,861
3/11/2019 17:50	3/12/2019 17:20	23.5	1.17	0.05	0.24	80.2	3/11/2019 17:45	3/12/2019 19:25	25.8	0.96	1.24	88,995
3/12/2019 19:25	3/12/2019 22:50	3.4	0.08	0.02	0.24	8.8	3/12/2019 19:25	3/13/2019 4:05	8.8	1.04	1.10	32,841
3/13/2019 4:05	3/13/2019 7:50	3.8	0.21	0.06	0.24	7.5	3/13/2019 4:05	3/13/2019 19:50	15.8	0.89	0.97	50,988
3/22/2019 19:10	3/22/2019 23:10	4.0	0.06	0.02	0.12	228.0	3/22/2019 19:10	3/23/2019 11:10	16.1	0.29	0.29	16,791
3/25/2019 17:30	3/26/2019 4:10	10.7	0.23	0.02	0.24	69.7	3/25/2019 17:25	3/26/2019 16:05	22.8	0.30	0.35	24,237
4/3/2019 3:05	4/3/2019 9:20	6.3	0.09	0.01	0.12	193.3	4/3/2019 3:00	4/3/2019 21:20	18.4	0.20	0.20	13,260
4/4/2019 23:40	4/5/2019 4:10	4.5	0.15	0.03	0.12	40.0	4/4/2019 23:35	4/5/2019 11:25	11.9	0.22	0.24	9,312
4/5/2019 11:25	4/5/2019 17:55	6.5	0.36	0.06	1.08	7.7	4/5/2019 11:25	4/6/2019 5:45	18.4	0.27	0.29	17,712
4/6/2019 5:50	4/6/2019 15:05	9.3	0.17	0.02	0.60	14.4	4/6/2019 5:45	4/6/2019 21:30	15.8	0.24	0.24	13,680
4/6/2019 21:35	4/7/2019 5:20	7.8	0.34	0.04	0.12	8.5	4/6/2019 21:30	4/7/2019 17:15	19.8	0.36	0.42	25,950
4/8/2019 17:30	4/9/2019 1:20	7.8	0.09	0.01	0.12	37.9	4/8/2019 17:25	4/9/2019 1:40	8.3	0.31	0.35	9,186
4/9/2019 1:40	4/9/2019 7:10	5.5	0.18	0.03	0.12	7.7	4/9/2019 1:40	4/9/2019 19:05	17.5	0.37	0.49	23,592
4/9/2019 19:45	4/10/2019 1:40	5.9	0.07	0.01	0.24	14.8	4/9/2019 19:40	4/10/2019 10:15	14.7	0.35	0.35	18,480
4/10/2019 10:20	4/12/2019 6:55	44.6	0.80	0.02	0.24	10.0	4/10/2019 10:15	4/12/2019 18:55	56.8	0.48	0.73	98,336
4/13/2019 5:35	4/13/2019 15:10	9.6	0.27	0.03	0.12	27.3	4/13/2019 5:35	4/14/2019 3:10	21.7	0.53	0.68	41,322
4/14/2019 19:20	4/14/2019 21:45	2.4	0.05	0.02	0.12	32.3	4/14/2019 19:15	4/15/2019 9:40	14.5	0.43	0.49	22,512
4/16/2019 16:55	4/16/2019 20:10	3.3	0.14	0.04	0.12	45.2	4/16/2019 16:50	4/17/2019 8:10	15.4	0.42	0.42	23,310
4/18/2019 4:55	4/18/2019 7:05	2.2	0.11	0.05	0.12	34.1	4/18/2019 4:50	4/18/2019 17:50	13.1	0.41	0.42	19,404

Table D-9. Summary Statistics for Individual Storm Events at the SEIMN Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
4/18/2019 17:50	4/18/2019 19:50	2.0	0.09	0.05	0.12	11.1	4/18/2019 17:50	4/19/2019 4:05	10.3	0.42	0.42	15,624
4/19/2019 4:05	4/19/2019 22:35	18.5	0.29	0.02	0.12	8.7	4/19/2019 4:05	4/20/2019 10:30	30.5	0.45	0.49	49,077
4/22/2019 11:40	4/22/2019 17:50	6.2	0.31	0.05	0.24	67.7	4/22/2019 11:35	4/23/2019 5:45	18.3	0.42	0.49	27,342
4/27/2019 5:45	4/27/2019 6:50	1.1	0.04	0.04	0.12	108.7	4/27/2019 5:45	4/27/2019 18:45	13.1	0.29	0.29	13,659
5/14/2019 9:10	5/14/2019 14:55	5.8	0.06	0.01	0.36	411.4	5/14/2019 9:10	5/15/2019 2:55	17.8	0.16	0.16	10,272
5/15/2019 16:25	5/15/2019 19:10	2.8	0.08	0.03	0.12	25.6	5/15/2019 16:25	5/16/2019 7:05	14.8	0.16	0.16	8,478
5/16/2019 13:45	5/17/2019 9:20	19.6	1.05	0.05	0.36	20.3	5/16/2019 13:40	5/17/2019 21:20	31.8	0.28	0.35	32,388
5/20/2019 8:35	5/21/2019 0:25	15.8	0.25	0.02	0.24	75.3	5/20/2019 8:35	5/21/2019 12:20	27.8	0.20	0.24	19,716
5/24/2019 8:45	5/24/2019 11:30	2.8	0.08	0.03	0.12	83.8	5/24/2019 8:45	5/24/2019 23:25	14.8	0.16	0.20	8,520
5/25/2019 11:55	5/25/2019 16:45	4.8	0.15	0.03	0.12	25.2	5/25/2019 11:55	5/26/2019 4:40	16.8	0.17	0.20	10,284
6/6/2019 15:50	6/6/2019 18:20	2.5	0.17	0.07	1.08	288.3	6/6/2019 15:50	6/7/2019 5:10	13.4	0.10	0.13	4,815
6/7/2019 5:10	6/7/2019 17:50	12.7	0.10	0.01	0.24	12.0	6/7/2019 5:10	6/8/2019 5:45	24.7	0.09	0.10	7,812
6/19/2019 18:50	6/20/2019 2:40	7.8	0.42	0.05	0.36	294.2	6/19/2019 18:45	6/20/2019 14:40	20.0	0.12	0.20	8,364
6/23/2019 6:25	6/23/2019 10:50	4.4	0.10	0.02	0.12	76.9	6/23/2019 6:20	6/23/2019 22:40	16.4	0.08	0.08	4,728
6/23/2019 22:45	6/24/2019 2:50	4.1	0.03	0.01	0.12	13.4	6/23/2019 22:40	6/24/2019 14:50	16.3	0.08	0.08	4,680
6/26/2019 14:45	6/26/2019 15:20	0.6	0.04	0.07	0.12	77.4	6/26/2019 14:45	6/27/2019 0:45	10.1	0.08	0.08	2,796
6/27/2019 0:50	6/27/2019 12:10	11.3	0.18	0.02	0.48	10.1	6/27/2019 0:45	6/28/2019 0:10	23.5	0.08	0.08	6,462
7/2/2019 11:55	7/2/2019 18:45	6.8	0.20	0.03	0.60	129.7	7/2/2019 11:55	7/3/2019 2:45	14.9	0.08	0.10	4,428
7/3/2019 2:50	7/3/2019 10:05	7.3	0.06	0.01	0.12	14.4	7/3/2019 2:45	7/3/2019 22:05	19.4	0.08	0.08	5,586
7/9/2019 21:35	7/10/2019 18:55	21.3	0.32	0.02	0.48	159.0	7/9/2019 21:30	7/11/2019 6:55	33.5	0.08	0.08	9,642
7/17/2019 5:40	7/17/2019 11:55	6.3	0.11	0.02	0.24	154.8	7/17/2019 5:35	7/17/2019 14:25	8.9	0.08	0.08	2,538
7/17/2019 14:25	7/17/2019 14:30	0.1	0.03	0.36	0.24	7.2	7/17/2019 14:25	7/17/2019 21:40	7.3	0.08	0.08	2,076
7/17/2019 21:40	7/18/2019 7:30	9.8	0.29	0.03	0.24	9.8	7/17/2019 21:40	7/18/2019 19:25	21.8	0.09	0.16	6,861
7/18/2019 19:30	7/19/2019 0:30	5.0	0.19	0.04	0.12	13.8	7/18/2019 19:25	7/19/2019 12:30	17.2	0.10	0.16	6,429
7/27/2019 4:50	7/27/2019 7:20	2.5	0.10	0.04	0.36	198.0	7/27/2019 4:50	7/27/2019 19:15	14.5	0.11	0.13	5,616
8/2/2019 3:10	8/2/2019 4:30	1.3	0.27	0.20	0.36	140.8	8/2/2019 3:10	8/2/2019 16:25	13.3	0.14	0.29	6,933
8/10/2019 3:50	8/10/2019 8:20	4.5	0.59	0.13	0.36	191.7	8/10/2019 3:45	8/10/2019 20:20	16.7	0.21	0.53	12,432
8/21/2019 5:30	8/21/2019 9:55	4.4	0.11	0.02	0.36	261.6	8/21/2019 5:25	8/21/2019 16:05	10.8	0.11	0.13	4,410
8/21/2019 16:10	8/21/2019 22:10	6.0	0.08	0.01	0.24	8.3	8/21/2019 16:05	8/22/2019 10:05	18.1	0.11	0.13	7,365
8/29/2019 18:15	8/29/2019 23:45	5.5	0.17	0.03	0.24	188.8	8/29/2019 18:10	8/30/2019 11:45	17.7	0.11	0.16	6,873
9/7/2019 19:40	9/7/2019 21:55	2.3	0.40	0.18	0.36	215.7	9/7/2019 19:40	9/8/2019 5:10	9.6	0.18	0.42	6,228
9/8/2019 5:15	9/8/2019 8:35	3.3	0.06	0.02	0.12	8.0	9/8/2019 5:10	9/8/2019 15:10	10.1	0.12	0.16	4,215
9/8/2019 15:15	9/8/2019 16:40	1.4	0.89	0.63	3.36	8.8	9/8/2019 15:10	9/9/2019 2:25	11.3	0.25	0.91	10,317
9/9/2019 2:25	9/9/2019 18:20	15.9	1.13	0.07	1.80	10.8	9/9/2019 2:25	9/10/2019 6:20	28.0	0.27	0.97	27,267
9/12/2019 20:00	9/12/2019 22:20	2.3	0.20	0.09	0.24	74.0	9/12/2019 20:00	9/13/2019 10:15	14.3	0.17	0.24	8,976
9/14/2019 20:20	9/15/2019 12:40	16.3	0.88	0.05	0.48	46.4	9/14/2019 20:15	9/16/2019 0:40	28.5	0.24	0.35	24,669
9/16/2019 23:55	9/17/2019 4:05	4.2	0.03	0.01	0.12	37.3	9/16/2019 23:55	9/17/2019 7:05	7.3	0.16	0.20	4,188
9/17/2019 7:05	9/18/2019 1:25	18.3	0.74	0.04	1.44	44.5	9/17/2019 7:05	9/18/2019 13:25	30.4	0.22	0.42	24,522
9/22/2019 6:20	9/23/2019 2:20	20.0	0.51	0.03	0.24	105.2	9/22/2019 6:20	9/23/2019 11:10	28.9	0.22	0.29	22,590
9/23/2019 11:10	9/23/2019 17:00	5.8	0.09	0.02	0.12	10.7	9/23/2019 11:10	9/24/2019 0:20	13.3	0.20	0.20	9,540
9/24/2019 0:25	9/24/2019 9:20	8.9	0.22	0.02	0.36	10.8	9/24/2019 0:20	9/24/2019 21:20	21.1	0.20	0.24	15,540
9/26/2019 4:40	9/26/2019 10:20	5.7	0.29	0.05	0.24	43.6	9/26/2019 4:40	9/26/2019 22:15	17.7	0.24	0.29	15,462
9/27/2019 2:05	9/27/2019 5:20	3.3	0.06	0.02	0.12	18.8	9/27/2019 2:00	9/27/2019 10:40	8.8	0.24	0.24	7,548

Table D-9. Summary Statistics for Individual Storm Events at the SEIMN Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
9/27/2019 10:40	9/27/2019 19:40	9.0	0.39	0.04	0.84	7.9	9/27/2019 10:40	9/28/2019 7:40	21.1	0.33	0.42	24,954
9/29/2019 1:05	9/29/2019 5:55	4.8	0.04	0.01	0.24	30.8	9/29/2019 1:05	9/29/2019 17:55	16.9	0.29	0.29	17,541

Table D-10. Summary Statistics for Individual Storm Events at the SEIMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 7:55	10/1/2018 20:35	12.7	0.49	0.04	0.24	14.1	10/1/2018 7:50	10/2/2018 8:35	24.8	0.47	0.87	41,949
10/2/2018 15:10	10/2/2018 17:20	2.2	0.06	0.03	0.24	19.0	10/2/2018 15:10	10/3/2018 5:15	14.2	0.35	0.41	17,658
10/5/2018 9:05	10/5/2018 18:15	9.2	0.52	0.06	0.24	64.4	10/5/2018 9:00	10/6/2018 6:10	21.3	0.51	0.87	38,907
10/8/2018 1:35	10/8/2018 5:15	3.7	0.03	0.01	0.12	55.8	10/8/2018 1:30	10/8/2018 10:15	8.8	0.37	0.37	11,742
10/8/2018 10:20	10/9/2018 7:10	20.8	0.66	0.03	0.24	64.6	10/8/2018 10:15	10/9/2018 19:05	32.9	0.64	1.09	75,339
10/23/2018 18:00	10/23/2018 19:00	1.0	0.04	0.04	0.12	347.8	10/23/2018 17:55	10/24/2018 6:55	13.1	0.35	0.37	16,563
10/25/2018 6:35	10/26/2018 9:10	26.6	0.82	0.03	0.24	36.6	10/25/2018 6:30	10/26/2018 21:10	38.8	0.56	1.25	77,865
10/27/2018 15:25	10/28/2018 6:40	15.3	1.22	0.08	0.36	30.8	10/27/2018 15:20	10/28/2018 17:00	25.8	0.99	2.29	91,389
10/28/2018 17:05	10/28/2018 22:00	4.9	0.10	0.02	0.12	10.8	10/28/2018 17:00	10/29/2018 9:55	17.0	0.46	0.50	27,882
10/29/2018 14:10	10/29/2018 14:25	0.3	0.07	0.28	0.24	16.6	10/29/2018 14:10	10/30/2018 2:25	12.3	0.42	0.45	18,648
10/30/2018 19:50	10/31/2018 2:15	6.4	0.17	0.03	0.12	29.5	10/30/2018 19:50	10/31/2018 14:10	18.4	0.44	0.55	29,151
10/31/2018 15:20	11/1/2018 10:30	19.2	0.44	0.02	0.24	17.2	10/31/2018 15:20	11/1/2018 22:30	31.3	0.50	0.87	56,610
11/1/2018 23:35	11/2/2018 20:45	21.2	1.29	0.06	3.12	14.1	11/1/2018 23:35	11/3/2018 8:45	33.3	0.68	2.16	81,630
11/3/2018 8:55	11/4/2018 0:30	15.6	0.28	0.02	0.12	16.3	11/3/2018 8:55	11/4/2018 4:15	19.4	0.51	0.67	35,700
11/4/2018 4:20	11/4/2018 5:50	1.5	0.08	0.05	0.12	9.8	11/4/2018 4:15	11/4/2018 15:10	11.0	0.47	0.50	18,423
11/4/2018 15:15	11/4/2018 22:05	6.8	0.10	0.01	0.24	10.5	11/4/2018 15:10	11/5/2018 10:05	19.0	0.42	0.45	28,572
11/5/2018 18:15	11/5/2018 23:40	5.4	0.03	0.01	0.12	25.1	11/5/2018 18:10	11/6/2018 11:35	17.5	0.39	0.41	24,738
11/9/2018 9:40	11/9/2018 12:05	2.4	0.08	0.03	0.12	112.5	11/9/2018 9:40	11/10/2018 0:00	14.4	0.38	0.41	19,863
11/14/2018 5:30	11/14/2018 8:30	3.0	0.08	0.03	0.12	114.6	11/14/2018 5:25	11/14/2018 20:25	15.1	0.38	0.41	20,655
11/15/2018 20:45	11/16/2018 6:00	9.3	0.20	0.02	0.12	36.8	11/15/2018 20:45	11/16/2018 17:55	21.3	0.41	0.45	31,497
11/21/2018 21:45	11/23/2018 19:40	45.9	1.26	0.03	0.72	139.1	11/21/2018 21:40	11/24/2018 7:40	58.1	0.64	1.51	134,793
11/26/2018 4:30	11/27/2018 6:20	25.8	1.20	0.05	0.24	62.0	11/26/2018 4:25	11/27/2018 14:55	34.6	0.91	1.71	113,244
11/27/2018 14:55	11/27/2018 20:30	5.6	0.44	0.08	0.60	9.0	11/27/2018 14:55	11/28/2018 2:35	11.8	0.87	1.25	36,915
11/28/2018 2:35	11/28/2018 18:00	15.4	0.28	0.02	0.36	7.0	11/28/2018 2:35	11/29/2018 6:00	27.5	0.65	1.01	63,867
11/30/2018 2:25	11/30/2018 6:05	3.7	0.06	0.02	0.12	35.2	11/30/2018 2:25	11/30/2018 18:00	15.7	0.44	0.45	24,804
11/30/2018 19:35	11/30/2018 22:10	2.6	0.14	0.05	0.12	15.3	11/30/2018 19:30	12/1/2018 9:55	14.5	0.51	0.67	26,487
12/1/2018 9:55	12/1/2018 12:35	2.7	0.05	0.02	0.12	12.3	12/1/2018 9:55	12/2/2018 0:30	14.7	0.44	0.45	23,100
12/9/2018 8:25	12/9/2018 22:55	14.5	0.73	0.05	0.12	190.2	12/9/2018 8:25	12/10/2018 10:50	26.5	0.70	1.25	66,696
12/10/2018 11:10	12/10/2018 11:15	0.1	0.03	0.36	0.24	14.8	12/10/2018 11:10	12/10/2018 23:10	12.1	0.46	0.50	20,010
12/11/2018 3:35	12/12/2018 0:40	21.1	0.57	0.03	0.48	31.2	12/11/2018 3:30	12/12/2018 12:40	33.3	0.68	1.17	81,927
12/12/2018 21:15	12/13/2018 17:00	19.8	0.13	0.01	0.12	24.6	12/12/2018 21:10	12/14/2018 5:00	31.9	0.43	0.50	49,143
12/15/2018 22:50	12/16/2018 7:15	8.4	0.33	0.04	0.12	65.2	12/15/2018 22:50	12/16/2018 13:25	14.7	0.47	0.61	25,020
12/16/2018 13:25	12/16/2018 21:50	8.4	0.22	0.03	0.24	8.3	12/16/2018 13:25	12/17/2018 5:25	16.1	0.46	0.61	26,643
12/17/2018 5:30	12/17/2018 6:05	0.6	0.03	0.05	0.12	7.8	12/17/2018 5:25	12/17/2018 17:10	11.8	0.40	0.41	16,866
12/17/2018 17:15	12/18/2018 8:10	14.9	0.52	0.03	0.24	19.6	12/17/2018 17:10	12/18/2018 13:30	20.4	0.57	0.80	42,168
12/18/2018 13:35	12/19/2018 0:15	10.7	0.28	0.03	0.36	7.3	12/18/2018 13:30	12/19/2018 12:10	22.8	0.57	0.94	46,758
12/19/2018 23:30	12/20/2018 11:10	11.7	0.23	0.02	0.24	29.0	12/19/2018 23:30	12/20/2018 23:10	23.8	0.46	0.55	39,105
12/22/2018 18:05	12/23/2018 14:20	20.3	0.80	0.04	0.36	55.3	12/22/2018 18:00	12/24/2018 2:20	32.4	0.61	1.25	71,757
12/26/2018 9:35	12/26/2018 12:25	2.8	0.07	0.02	0.12	68.4	12/26/2018 9:30	12/26/2018 23:25	14.0	0.37	0.41	18,696
12/26/2018 23:25	12/27/2018 0:15	0.8	0.04	0.05	0.12	12.5	12/26/2018 23:25	12/27/2018 12:10	12.8	0.37	0.41	16,962
12/28/2018 5:35	12/28/2018 21:40	16.1	0.82	0.05	0.12	30.2	12/28/2018 5:35	12/29/2018 9:40	28.2	0.71	1.42	71,571
12/29/2018 12:20	12/30/2018 2:35	14.3	1.12	0.08	0.48	15.3	12/29/2018 12:20	12/30/2018 14:35	26.3	1.22	2.29	115,503
12/30/2018 15:00	12/30/2018 15:35	0.6	0.11	0.19	0.24	12.8	12/30/2018 15:00	12/31/2018 3:30	12.6	0.65	0.80	29,226

Table D-10. Summary Statistics for Individual Storm Events at the SEIMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
1/2/2019 23:55	1/4/2019 7:20	31.4	1.05	0.03	0.36	80.6	1/2/2019 23:55	1/4/2019 12:40	36.8	0.86	2.04	113,910
1/4/2019 12:45	1/4/2019 20:30	7.8	0.08	0.01	0.12	8.3	1/4/2019 12:40	1/5/2019 8:25	19.8	0.64	0.73	45,462
1/5/2019 22:55	1/6/2019 3:45	4.8	0.09	0.02	0.12	31.2	1/5/2019 22:50	1/6/2019 15:40	16.9	0.53	0.61	32,205
1/6/2019 17:00	1/7/2019 1:25	8.4	0.47	0.06	0.24	14.8	1/6/2019 17:00	1/7/2019 13:25	20.5	0.83	1.33	61,074
1/8/2019 9:20	1/10/2019 13:55	52.6	0.72	0.01	0.24	32.7	1/8/2019 9:20	1/11/2019 1:50	64.6	0.62	0.73	143,408
1/17/2019 2:00	1/17/2019 3:40	1.7	0.17	0.10	0.24	159.2	1/17/2019 2:00	1/17/2019 15:40	13.8	0.44	0.50	21,675
1/17/2019 16:00	1/17/2019 21:55	5.9	0.04	0.01	0.12	12.7	1/17/2019 16:00	1/18/2019 9:55	18.0	0.41	0.41	26,568
1/18/2019 18:25	1/19/2019 2:35	8.2	0.22	0.03	0.24	26.4	1/18/2019 18:20	1/19/2019 14:35	20.3	0.44	0.50	31,884
1/22/2019 13:45	1/23/2019 9:50	20.1	1.00	0.05	0.24	87.9	1/22/2019 13:40	1/23/2019 21:45	32.2	0.79	1.25	91,812
1/24/2019 4:00	1/24/2019 7:55	3.9	0.03	0.01	0.12	20.2	1/24/2019 4:00	1/24/2019 19:50	15.9	0.50	0.55	28,875
2/1/2019 4:45	2/1/2019 21:30	16.8	0.67	0.04	0.24	213.0	2/1/2019 4:40	2/2/2019 9:30	28.9	0.62	0.94	65,055
2/5/2019 11:05	2/5/2019 13:55	2.8	0.52	0.18	0.36	87.8	2/5/2019 11:00	2/6/2019 1:50	14.9	0.40	0.41	21,669
2/6/2019 11:45	2/6/2019 12:05	0.3	0.03	0.09	0.12	22.1	2/6/2019 11:45	2/7/2019 0:00	12.3	0.37	0.41	16,632
2/9/2019 15:10	2/9/2019 16:10	1.0	0.05	0.05	0.12	97.5	2/9/2019 15:10	2/10/2019 4:10	13.1	0.38	0.41	18,099
2/13/2019 12:25	2/13/2019 18:20	5.9	0.77	0.13	1.44	93.2	2/13/2019 12:20	2/14/2019 6:20	18.1	0.53	0.55	34,680
2/14/2019 10:40	2/14/2019 23:40	13.0	0.56	0.04	0.24	18.2	2/14/2019 10:40	2/15/2019 6:00	19.4	0.61	0.73	42,501
2/15/2019 6:05	2/15/2019 9:15	3.2	0.04	0.01	0.12	9.6	2/15/2019 6:00	2/15/2019 21:10	15.3	0.60	0.67	33,057
2/16/2019 9:15	2/16/2019 23:05	13.8	0.54	0.04	0.24	27.2	2/16/2019 9:10	2/17/2019 11:00	25.9	0.86	1.17	80,487
2/19/2019 13:30	2/20/2019 3:05	13.6	0.43	0.03	0.24	64.2	2/19/2019 13:25	2/20/2019 15:00	25.7	0.93	1.25	85,617
2/22/2019 10:10	2/22/2019 16:55	6.8	0.22	0.03	0.12	58.3	2/22/2019 10:05	2/23/2019 4:50	18.8	0.73	0.94	49,578
2/23/2019 12:10	2/24/2019 0:35	12.4	0.16	0.01	0.36	21.8	2/23/2019 12:10	2/24/2019 12:30	24.4	0.79	0.94	69,606
3/6/2019 13:15	3/7/2019 0:20	11.1	0.15	0.01	0.12	257.0	3/6/2019 13:15	3/7/2019 10:25	21.3	0.42	0.45	31,845
3/7/2019 10:30	3/7/2019 17:40	7.2	0.26	0.04	0.36	13.8	3/7/2019 10:25	3/8/2019 5:35	19.3	0.45	0.50	31,035
3/8/2019 8:25	3/8/2019 11:35	3.2	0.09	0.03	0.12	15.9	3/8/2019 8:25	3/8/2019 23:35	15.3	0.44	0.50	23,922
3/11/2019 17:50	3/12/2019 17:20	23.5	1.17	0.05	0.24	80.2	3/11/2019 17:45	3/12/2019 19:25	25.8	1.12	2.04	104,121
3/12/2019 19:25	3/12/2019 22:50	3.4	0.08	0.02	0.24	8.8	3/12/2019 19:25	3/13/2019 4:05	8.8	0.94	1.09	29,547
3/13/2019 4:05	3/13/2019 7:50	3.8	0.21	0.06	0.24	7.5	3/13/2019 4:05	3/13/2019 19:50	15.8	0.76	0.80	43,239
3/22/2019 19:10	3/22/2019 23:10	4.0	0.06	0.02	0.12	228.0	3/22/2019 19:10	3/23/2019 11:10	16.1	0.33	0.33	19,107
3/25/2019 17:30	3/26/2019 4:10	10.7	0.23	0.02	0.24	69.7	3/25/2019 17:25	3/26/2019 16:05	22.8	0.37	0.50	29,973
4/3/2019 3:05	4/3/2019 9:20	6.3	0.09	0.01	0.12	193.3	4/3/2019 3:00	4/3/2019 21:20	18.4	0.29	0.33	19,491
4/4/2019 23:40	4/5/2019 4:10	4.5	0.15	0.03	0.12	40.0	4/4/2019 23:35	4/5/2019 11:25	11.9	0.33	0.37	14,181
4/5/2019 11:25	4/5/2019 17:55	6.5	0.36	0.06	1.08	7.7	4/5/2019 11:25	4/6/2019 5:45	18.4	0.50	0.80	33,154
4/6/2019 5:50	4/6/2019 15:05	9.3	0.17	0.02	0.60	14.4	4/6/2019 5:45	4/6/2019 21:30	15.8	0.45	0.50	25,647
4/6/2019 21:35	4/7/2019 5:20	7.8	0.34	0.04	0.12	8.5	4/6/2019 21:30	4/7/2019 17:15	19.8	0.64	0.94	45,375
4/8/2019 17:30	4/9/2019 1:20	7.8	0.09	0.01	0.12	37.9	4/8/2019 17:25	4/9/2019 1:40	8.3	0.50	0.55	14,994
4/9/2019 1:40	4/9/2019 7:10	5.5	0.18	0.03	0.12	7.7	4/9/2019 1:40	4/9/2019 19:05	17.5	0.64	0.87	40,213
4/9/2019 19:45	4/10/2019 1:40	5.9	0.07	0.01	0.24	14.8	4/9/2019 19:40	4/10/2019 10:15	14.7	0.49	0.55	26,064
4/10/2019 10:20	4/12/2019 6:55	44.6	0.80	0.02	0.24	10.0	4/10/2019 10:15	4/12/2019 18:55	56.8	0.66	1.33	134,391
4/13/2019 5:35	4/13/2019 15:10	9.6	0.27	0.03	0.12	27.3	4/13/2019 5:35	4/14/2019 3:10	21.7	0.64	0.87	49,863
4/14/2019 19:20	4/14/2019 21:45	2.4	0.05	0.02	0.12	32.3	4/14/2019 19:15	4/15/2019 9:40	14.5	0.53	0.61	27,834
4/16/2019 16:55	4/16/2019 20:10	3.3	0.14	0.04	0.12	45.2	4/16/2019 16:50	4/17/2019 8:10	15.4	0.51	0.55	28,365
4/18/2019 4:55	4/18/2019 7:05	2.2	0.11	0.05	0.12	34.1	4/18/2019 4:50	4/18/2019 17:50	13.1	0.50	0.67	23,688
4/18/2019 17:50	4/18/2019 19:50	2.0	0.09	0.05	0.12	11.1	4/18/2019 17:50	4/19/2019 4:05	10.3	0.48	0.55	17,820
4/19/2019 4:05	4/19/2019 22:35	18.5	0.29	0.02	0.12	8.7	4/19/2019 4:05	4/20/2019 10:30	30.5	0.56	0.67	61,317

Table D-10. Summary Statistics for Individual Storm Events at the SEIMS Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
4/22/2019 11:40	4/22/2019 17:50	6.2	0.31	0.05	0.24	67.7	4/22/2019 11:35	4/23/2019 5:45	18.3	0.52	0.80	34,041
4/27/2019 5:45	4/27/2019 6:50	1.1	0.04	0.04	0.12	108.7	4/27/2019 5:45	4/27/2019 18:45	13.1	0.41	0.50	19,488
5/14/2019 9:10	5/14/2019 14:55	5.8	0.06	0.01	0.36	411.4	5/14/2019 9:10	5/15/2019 2:55	17.8	0.32	0.37	20,306
5/15/2019 16:25	5/15/2019 19:10	2.8	0.08	0.03	0.12	25.6	5/15/2019 16:25	5/16/2019 7:05	14.8	0.30	0.33	15,719
5/16/2019 13:45	5/17/2019 9:20	19.6	1.05	0.05	0.36	20.3	5/16/2019 13:40	5/17/2019 21:20	31.8	0.62	1.42	71,343
5/20/2019 8:35	5/21/2019 0:25	15.8	0.25	0.02	0.24	75.3	5/20/2019 8:35	5/21/2019 12:20	27.8	0.37	0.50	36,751
5/24/2019 8:45	5/24/2019 11:30	2.8	0.08	0.03	0.12	83.8	5/24/2019 8:45	5/24/2019 23:25	14.8	0.30	0.33	15,735
5/25/2019 11:55	5/25/2019 16:45	4.8	0.15	0.03	0.12	25.2	5/25/2019 11:55	5/26/2019 4:40	16.8	0.34	0.41	20,862
6/6/2019 15:50	6/6/2019 18:20	2.5	0.17	0.07	1.08	288.3	6/6/2019 15:50	6/7/2019 5:10	13.4	0.36	0.50	17,469
6/7/2019 5:10	6/7/2019 17:50	12.7	0.10	0.01	0.24	12.0	6/7/2019 5:10	6/8/2019 5:45	24.7	0.33	0.37	29,136
6/19/2019 18:50	6/20/2019 2:40	7.8	0.42	0.05	0.36	294.2	6/19/2019 18:45	6/20/2019 14:40	20.0	0.41	0.73	29,721
6/23/2019 6:25	6/23/2019 10:50	4.4	0.10	0.02	0.12	76.9	6/23/2019 6:20	6/23/2019 22:40	16.4	0.25	0.29	15,009
6/23/2019 22:45	6/24/2019 2:50	4.1	0.03	0.01	0.12	13.4	6/23/2019 22:40	6/24/2019 14:50	16.3	0.25	0.29	14,592
6/26/2019 14:45	6/26/2019 15:20	0.6	0.04	0.07	0.12	77.4	6/26/2019 14:45	6/27/2019 0:45	10.1	0.22	0.25	7,986
6/27/2019 0:50	6/27/2019 12:10	11.3	0.18	0.02	0.48	10.1	6/27/2019 0:45	6/28/2019 0:10	23.5	0.24	0.29	20,016
7/2/2019 11:55	7/2/2019 18:45	6.8	0.20	0.03	0.60	129.7	7/2/2019 11:55	7/3/2019 2:45	14.9	0.25	0.29	13,521
7/3/2019 2:50	7/3/2019 10:05	7.3	0.06	0.01	0.12	14.4	7/3/2019 2:45	7/3/2019 22:05	19.4	0.28	0.33	19,839
7/9/2019 21:35	7/10/2019 18:55	21.3	0.32	0.02	0.48	159.0	7/9/2019 21:30	7/11/2019 6:55	33.5	0.24	0.29	28,467
7/17/2019 5:40	7/17/2019 11:55	6.3	0.11	0.02	0.24	154.8	7/17/2019 5:35	7/17/2019 14:25	8.9	0.21	0.25	6,855
7/17/2019 14:25	7/17/2019 14:30	0.1	0.03	0.36	0.24	7.2	7/17/2019 14:25	7/17/2019 21:40	7.3	0.22	0.25	5,706
7/17/2019 21:40	7/18/2019 7:30	9.8	0.29	0.03	0.24	9.8	7/17/2019 21:40	7/18/2019 19:25	21.8	0.30	0.55	23,637
7/18/2019 19:30	7/19/2019 0:30	5.0	0.19	0.04	0.12	13.8	7/18/2019 19:25	7/19/2019 12:30	17.2	0.30	0.45	18,438
7/27/2019 4:50	7/27/2019 7:20	2.5	0.10	0.04	0.36	198.0	7/27/2019 4:50	7/27/2019 19:15	14.5	0.18	0.22	9,567
8/2/2019 3:10	8/2/2019 4:30	1.3	0.27	0.20	0.36	140.8	8/2/2019 3:10	8/2/2019 16:25	13.3	0.30	0.50	14,463
8/10/2019 3:50	8/10/2019 8:20	4.5	0.59	0.13	0.36	191.7	8/10/2019 3:45	8/10/2019 20:20	16.7	0.45	1.09	26,920
8/21/2019 5:30	8/21/2019 9:55	4.4	0.11	0.02	0.36	261.6	8/21/2019 5:25	8/21/2019 16:05	10.8	0.19	0.22	7,461
8/21/2019 16:10	8/21/2019 22:10	6.0	0.08	0.01	0.24	8.3	8/21/2019 16:05	8/22/2019 10:05	18.1	0.20	0.25	13,311
8/29/2019 18:15	8/29/2019 23:45	5.5	0.17	0.03	0.24	188.8	8/29/2019 18:10	8/30/2019 11:45	17.7	0.23	0.29	14,637
9/7/2019 19:40	9/7/2019 21:55	2.3	0.40	0.18	0.36	215.7	9/7/2019 19:40	9/8/2019 5:10	9.6	0.45	0.94	15,654
9/8/2019 5:15	9/8/2019 8:35	3.3	0.06	0.02	0.12	8.0	9/8/2019 5:10	9/8/2019 15:10	10.1	0.25	0.45	9,084
9/8/2019 15:15	9/8/2019 16:40	1.4	0.89	0.63	3.36	8.8	9/8/2019 15:10	9/9/2019 2:25	11.3	0.88	3.73	35,964
9/9/2019 2:25	9/9/2019 18:20	15.9	1.13	0.07	1.80	10.8	9/9/2019 2:25	9/10/2019 6:20	28.0	0.56	1.71	55,953
9/12/2019 20:00	9/12/2019 22:20	2.3	0.20	0.09	0.24	74.0	9/12/2019 20:00	9/13/2019 10:15	14.3	0.22	0.29	11,100
9/14/2019 20:20	9/15/2019 12:40	16.3	0.88	0.05	0.48	46.4	9/14/2019 20:15	9/16/2019 0:40	28.5	0.38	0.87	39,312
9/16/2019 23:55	9/17/2019 4:05	4.2	0.03	0.01	0.12	37.3	9/16/2019 23:55	9/17/2019 7:05	7.3	0.17	0.19	4,392
9/17/2019 7:05	9/18/2019 1:25	18.3	0.74	0.04	1.44	44.5	9/17/2019 7:05	9/18/2019 13:25	30.4	0.37	0.73	40,374
9/22/2019 6:20	9/23/2019 2:20	20.0	0.51	0.03	0.24	105.2	9/22/2019 6:20	9/23/2019 11:10	28.9	0.32	0.50	33,198
9/23/2019 11:10	9/23/2019 17:00	5.8	0.09	0.02	0.12	10.7	9/23/2019 11:10	9/24/2019 0:20	13.3	0.27	0.33	12,874
9/24/2019 0:25	9/24/2019 9:20	8.9	0.22	0.02	0.36	10.8	9/24/2019 0:20	9/24/2019 21:20	21.1	0.28	0.37	21,369
9/26/2019 4:40	9/26/2019 10:20	5.7	0.29	0.05	0.24	43.6	9/26/2019 4:40	9/26/2019 22:15	17.7	0.29	0.45	18,723
9/27/2019 2:05	9/27/2019 5:20	3.3	0.06	0.02	0.12	18.8	9/27/2019 2:00	9/27/2019 10:40	8.8	0.29	0.33	9,072
9/27/2019 10:40	9/27/2019 19:40	9.0	0.39	0.04	0.84	7.9	9/27/2019 10:40	9/28/2019 7:40	21.1	0.41	0.67	31,104
9/29/2019 1:05	9/29/2019 5:55	4.8	0.04	0.01	0.24	30.8	9/29/2019 1:05	9/29/2019 17:55	16.9	0.24	0.29	14,703

Table D-11. Summary Statistics for Individual Storm Events at the COUMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 7:05	10/1/2018 14:10	7.1	0.08	0.01	0.12	32.8	10/1/2018 7:05	10/1/2018 15:40	8.7	0.21	0.33	6,549
10/1/2018 15:40	10/1/2018 20:00	4.3	0.33	0.08	0.24	6.5	10/1/2018 15:40	10/2/2018 8:00	16.4	0.50	2.32	29,475
10/2/2018 16:10	10/2/2018 19:30	3.3	0.06	0.02	0.24	21.3	10/2/2018 16:10	10/3/2018 7:25	15.3	0.18	0.45	10,143
10/5/2018 8:50	10/5/2018 18:40	9.8	0.43	0.04	0.24	63.2	10/5/2018 8:50	10/6/2018 6:40	21.9	0.47	1.44	37,419
10/7/2018 23:15	10/8/2018 5:15	6.0	0.04	0.01	0.12	53.5	10/7/2018 23:10	10/8/2018 9:40	10.6	0.18	0.20	6,720
10/8/2018 9:40	10/9/2018 5:45	20.1	0.77	0.04	0.36	10.4	10/8/2018 9:40	10/9/2018 17:45	32.2	0.74	3.31	85,941
10/25/2018 7:30	10/26/2018 8:55	25.4	0.88	0.03	0.36	387.1	10/25/2018 7:30	10/26/2018 20:55	37.5	0.47	4.11	63,852
10/27/2018 15:15	10/28/2018 6:30	15.3	1.27	0.08	0.60	30.6	10/27/2018 15:10	10/28/2018 14:25	23.3	1.51	6.63	127,014
10/28/2018 14:30	10/28/2018 21:40	7.2	0.13	0.02	0.24	8.3	10/28/2018 14:25	10/29/2018 9:40	19.3	0.37	1.14	25,536
10/30/2018 20:00	10/31/2018 2:05	6.1	0.15	0.02	0.24	46.6	10/30/2018 20:00	10/31/2018 14:00	18.1	0.22	0.60	14,424
10/31/2018 16:10	10/31/2018 20:10	4.0	0.03	0.01	0.12	17.8	10/31/2018 16:10	11/1/2018 0:10	8.1	0.19	0.20	5,406
11/1/2018 0:15	11/1/2018 9:45	9.5	0.13	0.01	0.12	25.9	11/1/2018 0:10	11/1/2018 21:45	21.7	0.24	0.60	18,864
11/1/2018 23:45	11/2/2018 17:25	17.7	0.48	0.03	0.60	14.8	11/1/2018 23:45	11/3/2018 5:25	29.8	0.42	1.66	45,489
11/3/2018 9:50	11/3/2018 19:05	9.3	0.21	0.02	0.12	17.8	11/3/2018 9:50	11/4/2018 2:10	16.4	0.44	1.34	25,995
11/4/2018 2:10	11/4/2018 6:05	3.9	0.04	0.01	0.12	8.9	11/4/2018 2:10	11/4/2018 14:25	12.3	0.28	0.39	12,441
11/4/2018 14:25	11/4/2018 20:10	5.8	0.15	0.03	0.48	12.2	11/4/2018 14:25	11/5/2018 8:10	17.8	0.71	12.87	45,330
11/5/2018 14:35	11/5/2018 15:30	0.9	0.04	0.04	0.24	22.6	11/5/2018 14:35	11/6/2018 0:10	9.7	0.26	1.05	8,979
11/6/2018 0:10	11/6/2018 0:50	0.7	0.05	0.08	0.12	9.6	11/6/2018 0:10	11/6/2018 12:45	12.7	0.19	0.45	8,622
11/9/2018 9:50	11/9/2018 11:40	1.8	0.08	0.04	0.12	81.4	11/9/2018 9:45	11/9/2018 23:35	13.9	0.16	0.45	8,037
11/13/2018 23:35	11/14/2018 8:30	8.9	0.11	0.01	0.24	108.6	11/13/2018 23:35	11/14/2018 20:25	20.9	0.15	0.52	10,956
11/16/2018 1:15	11/16/2018 5:25	4.2	0.07	0.02	0.12	41.4	11/16/2018 1:15	11/16/2018 17:25	16.3	0.14	0.17	8,316
11/21/2018 21:40	11/22/2018 4:30	6.8	0.13	0.02	0.12	139.9	11/21/2018 21:40	11/22/2018 11:45	14.2	0.18	0.52	8,958
11/22/2018 11:45	11/23/2018 21:50	34.1	1.21	0.04	0.48	8.1	11/22/2018 11:45	11/24/2018 9:50	46.2	0.80	5.02	132,513
11/26/2018 4:20	11/27/2018 6:20	26.0	1.38	0.05	0.24	56.2	11/26/2018 4:15	11/27/2018 14:45	34.6	1.32	3.50	164,067
11/27/2018 14:50	11/27/2018 20:20	5.5	0.30	0.05	0.36	8.9	11/27/2018 14:45	11/28/2018 3:55	13.3	0.67	3.13	32,064
11/28/2018 3:55	11/28/2018 4:55	1.0	0.16	0.16	0.24	9.4	11/28/2018 3:55	11/28/2018 11:10	7.3	0.91	5.02	23,955
11/28/2018 11:10	11/28/2018 17:45	6.6	0.06	0.01	0.12	6.4	11/28/2018 11:10	11/29/2018 5:45	18.7	0.28	0.45	18,948
11/30/2018 19:10	11/30/2018 22:55	3.8	0.19	0.05	0.12	52.2	11/30/2018 19:05	12/1/2018 10:50	15.8	0.34	1.66	19,362
12/1/2018 11:15	12/1/2018 15:55	4.7	0.03	0.01	0.12	13.8	12/1/2018 11:10	12/2/2018 3:55	16.8	0.14	0.20	8,664
12/9/2018 9:15	12/9/2018 20:40	11.4	0.64	0.06	0.12	203.8	12/9/2018 9:10	12/10/2018 8:00	22.9	0.72	1.91	59,583
12/10/2018 8:00	12/10/2018 11:05	3.1	0.05	0.02	0.24	11.8	12/10/2018 8:00	12/10/2018 23:00	15.1	0.25	1.24	13,350
12/11/2018 3:00	12/12/2018 0:25	21.4	0.53	0.02	0.24	16.1	12/11/2018 2:55	12/12/2018 12:20	33.5	0.60	2.96	72,630
12/12/2018 18:40	12/13/2018 16:35	21.9	0.17	0.01	0.12	20.2	12/12/2018 18:40	12/14/2018 4:30	33.9	0.23	0.52	28,620
12/15/2018 22:45	12/16/2018 8:40	9.9	0.29	0.03	0.24	56.7	12/15/2018 22:40	12/16/2018 14:15	15.7	0.37	1.44	20,865
12/16/2018 14:20	12/16/2018 21:45	7.4	0.22	0.03	0.24	9.4	12/16/2018 14:15	12/17/2018 5:15	15.1	0.42	1.78	22,959
12/17/2018 5:20	12/17/2018 5:55	0.6	0.03	0.05	0.12	7.8	12/17/2018 5:15	12/17/2018 16:50	11.7	0.22	0.39	9,066
12/17/2018 16:50	12/18/2018 8:05	15.3	0.59	0.04	0.24	19.2	12/17/2018 16:50	12/18/2018 13:30	20.8	1.08	2.79	80,364
12/18/2018 13:35	12/19/2018 0:00	10.4	0.29	0.03	0.36	7.3	12/18/2018 13:30	12/19/2018 12:00	22.6	1.06	4.55	86,487
12/20/2018 1:55	12/20/2018 16:05	14.2	0.23	0.02	0.24	31.7	12/20/2018 1:50	12/21/2018 4:05	26.3	0.81	4.78	76,380
12/22/2018 17:45	12/23/2018 14:05	20.3	0.80	0.04	0.36	55.0	12/22/2018 17:45	12/24/2018 2:00	32.3	1.17	5.79	136,494
12/26/2018 9:10	12/26/2018 11:40	2.5	0.06	0.02	0.12	72.2	12/26/2018 9:10	12/26/2018 23:35	14.5	0.18	0.33	9,552
12/27/2018 1:35	12/27/2018 5:55	4.3	0.09	0.02	0.24	15.0	12/27/2018 1:35	12/27/2018 17:55	16.4	0.21	0.60	12,423
12/28/2018 4:50	12/28/2018 21:35	16.8	0.67	0.04	0.24	26.8	12/28/2018 4:50	12/29/2018 9:30	28.8	1.06	3.31	109,293

Table D-11. Summary Statistics for Individual Storm Events at the COUMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
12/29/2018 12:55	12/30/2018 2:30	13.6	0.68	0.05	0.36	16.2	12/29/2018 12:55	12/30/2018 14:25	25.6	1.60	4.33	147,168
1/2/2019 23:50	1/4/2019 6:55	31.1	0.95	0.03	0.36	93.4	1/2/2019 23:45	1/4/2019 14:55	39.3	1.30	3.31	183,075
1/4/2019 14:55	1/4/2019 18:00	3.1	0.03	0.01	0.12	10.2	1/4/2019 14:55	1/5/2019 5:55	15.1	0.59	0.89	32,013
1/5/2019 17:25	1/6/2019 2:50	9.4	0.20	0.02	0.24	36.8	1/5/2019 17:25	1/6/2019 14:45	21.4	0.53	1.44	41,238
1/6/2019 17:00	1/7/2019 0:55	7.9	0.53	0.07	0.24	15.0	1/6/2019 17:00	1/7/2019 12:55	20.0	1.57	4.78	112,698
1/8/2019 8:50	1/10/2019 9:55	49.1	0.49	0.01	0.12	34.7	1/8/2019 8:45	1/10/2019 10:40	50.0	0.59	1.34	106,245
1/10/2019 10:40	1/10/2019 13:35	2.9	0.03	0.01	0.12	9.1	1/10/2019 10:40	1/11/2019 1:30	14.9	0.41	0.69	22,035
1/17/2019 1:55	1/17/2019 3:15	1.3	0.10	0.08	0.12	160.0	1/17/2019 1:50	1/17/2019 15:10	13.4	0.26	0.78	12,444
1/17/2019 17:20	1/17/2019 22:45	5.4	0.03	0.01	0.12	14.6	1/17/2019 17:15	1/18/2019 4:15	11.1	0.19	0.20	7,431
1/18/2019 4:15	1/18/2019 5:35	1.3	0.07	0.05	0.12	25.5	1/18/2019 4:15	1/18/2019 17:35	13.4	0.25	0.97	12,060
1/18/2019 18:30	1/19/2019 2:20	7.8	0.23	0.03	0.24	13.4	1/18/2019 18:30	1/19/2019 13:40	19.3	0.52	2.18	35,898
1/19/2019 13:40	1/19/2019 16:40	3.0	0.04	0.01	0.24	15.2	1/19/2019 13:40	1/20/2019 4:40	15.1	0.27	0.60	14,586
1/22/2019 13:35	1/23/2019 9:30	19.9	0.82	0.04	0.36	71.9	1/22/2019 13:30	1/23/2019 21:30	32.1	1.12	4.33	129,804
1/24/2019 2:45	1/24/2019 8:10	5.4	0.03	0.01	0.12	18.6	1/24/2019 2:45	1/24/2019 20:10	17.5	0.39	0.52	24,702
2/1/2019 4:40	2/1/2019 21:55	17.3	0.66	0.04	0.12	212.5	2/1/2019 4:40	2/2/2019 9:55	29.3	0.81	2.04	85,203
2/5/2019 11:00	2/5/2019 14:55	3.9	0.20	0.05	0.24	87.8	2/5/2019 11:00	2/6/2019 2:55	16.0	0.21	0.29	12,336
2/6/2019 10:45	2/6/2019 15:15	4.5	0.17	0.04	0.24	20.5	2/6/2019 10:40	2/7/2019 3:10	16.6	0.19	0.24	11,124
2/7/2019 11:10	2/7/2019 11:20	0.2	0.04	0.24	0.24	20.5	2/7/2019 11:10	2/7/2019 23:15	12.2	0.18	0.20	8,040
2/9/2019 14:20	2/9/2019 15:35	1.3	0.03	0.02	0.12	51.2	2/9/2019 14:15	2/10/2019 3:30	13.3	0.20	0.24	9,723
2/13/2019 11:15	2/13/2019 13:20	2.1	0.20	0.10	0.24	144.1	2/13/2019 11:10	2/14/2019 1:20	14.3	1.19	1.44	61,200
2/14/2019 8:45	2/14/2019 21:15	12.5	0.68	0.05	0.12	19.7	2/14/2019 8:45	2/15/2019 9:10	24.5	1.19	1.91	104,703
2/16/2019 8:50	2/16/2019 22:25	13.6	0.36	0.03	0.24	36.8	2/16/2019 8:45	2/17/2019 10:25	25.8	1.46	2.79	135,759
2/19/2019 13:25	2/20/2019 2:55	13.5	0.43	0.03	0.24	64.5	2/19/2019 13:25	2/20/2019 14:55	25.6	1.39	3.31	128,460
2/22/2019 12:15	2/22/2019 15:55	3.7	0.28	0.08	0.24	59.8	2/22/2019 12:10	2/23/2019 3:55	15.8	1.08	2.79	61,794
2/23/2019 12:35	2/23/2019 20:45	8.2	0.21	0.03	0.36	21.8	2/23/2019 12:30	2/24/2019 8:45	20.3	1.06	2.63	77,535
3/6/2019 14:45	3/6/2019 19:20	4.6	0.08	0.02	0.12	258.3	3/6/2019 14:45	3/7/2019 7:20	16.7	0.23	0.33	13,953
3/7/2019 9:05	3/7/2019 16:05	7.0	0.18	0.03	0.24	15.9	3/7/2019 9:00	3/8/2019 4:05	19.2	0.36	0.78	25,089
3/8/2019 8:25	3/8/2019 9:55	1.5	0.12	0.08	0.24	22.1	3/8/2019 8:25	3/8/2019 21:55	13.6	0.40	0.89	19,359
3/11/2019 17:40	3/12/2019 20:35	26.9	1.17	0.04	0.24	80.0	3/11/2019 17:35	3/13/2019 8:35	39.1	1.19	4.33	168,066
3/25/2019 17:00	3/26/2019 7:35	14.6	0.27	0.02	0.12	308.8	3/25/2019 17:00	3/26/2019 19:30	26.6	0.18	0.88	17,022
4/3/2019 1:20	4/3/2019 8:45	7.4	0.06	0.01	0.12	191.8	4/3/2019 1:20	4/3/2019 20:45	19.5	0.07	0.13	5,091
4/4/2019 21:25	4/5/2019 3:55	6.5	0.21	0.03	0.12	40.4	4/4/2019 21:20	4/5/2019 11:00	13.8	0.16	0.46	8,151
4/5/2019 11:00	4/5/2019 17:35	6.6	0.32	0.05	0.48	7.6	4/5/2019 11:00	4/6/2019 5:35	18.7	0.30	1.49	20,352
4/6/2019 6:05	4/6/2019 12:55	6.8	0.10	0.01	0.24	14.8	4/6/2019 6:00	4/6/2019 21:55	16.0	0.15	0.27	8,781
4/6/2019 21:55	4/7/2019 4:45	6.8	0.41	0.06	0.12	13.0	4/6/2019 21:55	4/7/2019 16:40	18.8	0.48	1.20	32,286
4/8/2019 17:15	4/9/2019 13:00	19.8	0.55	0.03	0.48	37.7	4/8/2019 17:10	4/10/2019 1:00	31.9	0.54	4.94	61,542
4/10/2019 10:35	4/11/2019 13:50	27.3	0.54	0.02	0.24	23.3	4/10/2019 10:30	4/11/2019 21:55	35.5	0.52	1.29	65,847
4/11/2019 21:55	4/12/2019 6:35	8.7	0.36	0.04	0.24	9.2	4/11/2019 21:55	4/12/2019 18:30	20.7	0.80	2.79	59,760
4/13/2019 5:30	4/13/2019 15:40	10.2	0.26	0.03	0.12	27.2	4/13/2019 5:30	4/14/2019 3:40	22.3	0.47	0.95	37,341
4/14/2019 18:55	4/14/2019 21:25	2.5	0.04	0.02	0.12	28.1	4/14/2019 18:55	4/15/2019 9:20	14.5	0.21	0.24	11,220
4/16/2019 16:55	4/16/2019 19:40	2.8	0.14	0.05	0.12	46.0	4/16/2019 16:50	4/17/2019 7:40	14.9	0.25	0.74	13,536
4/18/2019 4:55	4/18/2019 7:25	2.5	0.12	0.05	0.12	34.0	4/18/2019 4:50	4/18/2019 17:55	13.2	0.22	0.74	10,476
4/18/2019 17:55	4/18/2019 22:45	4.8	0.10	0.02	0.12	11.2	4/18/2019 17:55	4/19/2019 4:40	10.8	0.26	0.95	10,293
4/19/2019 4:40	4/19/2019 22:45	18.1	0.26	0.01	0.12	9.1	4/19/2019 4:40	4/20/2019 10:40	30.1	0.33	0.88	35,922

Table D-11. Summary Statistics for Individual Storm Events at the COUMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
4/22/2019 11:00	4/22/2019 17:20	6.3	0.22	0.03	0.24	64.7	4/22/2019 11:00	4/23/2019 5:15	18.3	0.27	0.88	17,934
5/14/2019 8:05	5/14/2019 14:50	6.8	0.06	0.01	0.12	519.4	5/14/2019 8:05	5/15/2019 2:45	18.8	0.09	0.13	6,147
5/15/2019 15:45	5/15/2019 19:45	4.0	0.10	0.03	0.12	30.6	5/15/2019 15:40	5/16/2019 7:40	16.1	0.11	0.18	6,108
5/16/2019 13:35	5/17/2019 7:15	17.7	0.78	0.04	0.24	19.2	5/16/2019 13:30	5/17/2019 19:15	29.8	0.52	2.20	55,956
5/20/2019 9:35	5/20/2019 22:45	13.2	0.43	0.03	0.12	77.3	5/20/2019 9:30	5/21/2019 10:40	25.3	0.33	1.20	29,871
5/25/2019 11:10	5/25/2019 17:00	5.8	0.24	0.04	0.12	110.2	5/25/2019 11:10	5/26/2019 5:00	17.9	0.22	0.59	14,268
6/6/2019 14:40	6/6/2019 18:25	3.8	0.19	0.05	0.48	286.8	6/6/2019 14:35	6/7/2019 6:20	15.8	0.11	0.31	5,985
6/19/2019 15:45	6/20/2019 3:00	11.3	0.59	0.05	0.36	310.2	6/19/2019 15:40	6/20/2019 14:55	23.3	0.44	2.95	37,092
6/23/2019 5:50	6/23/2019 7:25	1.6	0.05	0.03	0.12	76.2	6/23/2019 5:45	6/23/2019 19:25	13.8	0.09	0.15	4,329

Table D-12. Summary Statistics for Individual Storm Events at the COUMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 7:05	10/1/2018 14:10	7.1	0.08	0.01	0.12	32.8	10/1/2018 7:05	10/1/2018 15:40	8.7	0.09	0.12	2,889
10/1/2018 15:40	10/1/2018 20:00	4.3	0.33	0.08	0.24	6.5	10/1/2018 15:40	10/2/2018 8:00	16.4	0.11	0.29	6,672
10/2/2018 16:10	10/2/2018 19:30	3.3	0.06	0.02	0.24	21.3	10/2/2018 16:10	10/3/2018 7:25	15.3	0.09	0.12	4,983
10/5/2018 8:50	10/5/2018 18:40	9.8	0.43	0.04	0.24	63.2	10/5/2018 8:50	10/6/2018 6:40	21.9	0.11	0.24	8,712
10/7/2018 23:15	10/8/2018 5:15	6.0	0.04	0.01	0.12	53.5	10/7/2018 23:10	10/8/2018 9:40	10.6	0.08	0.09	2,922
10/8/2018 9:40	10/9/2018 5:45	20.1	0.77	0.04	0.36	10.4	10/8/2018 9:40	10/9/2018 17:45	32.2	0.14	0.44	16,749
10/25/2018 7:30	10/26/2018 8:55	25.4	0.88	0.03	0.36	387.1	10/25/2018 7:30	10/26/2018 20:55	37.5	0.21	0.69	27,807
10/27/2018 15:15	10/28/2018 6:30	15.3	1.27	0.08	0.60	30.6	10/27/2018 15:10	10/28/2018 14:25	23.3	0.35	0.74	29,277
10/28/2018 14:30	10/28/2018 21:40	7.2	0.13	0.02	0.24	8.3	10/28/2018 14:25	10/29/2018 9:40	19.3	0.20	0.41	13,863
10/30/2018 20:00	10/31/2018 2:05	6.1	0.15	0.02	0.24	46.6	10/30/2018 20:00	10/31/2018 14:00	18.1	0.15	0.25	10,032
10/31/2018 16:10	10/31/2018 20:10	4.0	0.03	0.01	0.12	17.8	10/31/2018 16:10	11/1/2018 0:10	8.1	0.14	0.15	3,951
11/1/2018 0:15	11/1/2018 9:45	9.5	0.13	0.01	0.12	25.9	11/1/2018 0:10	11/1/2018 21:45	21.7	0.15	0.22	12,057
11/1/2018 23:45	11/2/2018 17:25	17.7	0.48	0.03	0.60	14.8	11/1/2018 23:45	11/3/2018 5:25	29.8	0.20	0.45	21,135
11/3/2018 9:50	11/3/2018 19:05	9.3	0.21	0.02	0.12	17.8	11/3/2018 9:50	11/4/2018 2:10	16.4	0.21	0.34	12,681
11/4/2018 2:10	11/4/2018 6:05	3.9	0.04	0.01	0.12	8.9	11/4/2018 2:10	11/4/2018 14:25	12.3	0.19	0.22	8,445
11/4/2018 14:25	11/4/2018 20:10	5.8	0.15	0.03	0.48	12.2	11/4/2018 14:25	11/5/2018 8:10	17.8	0.20	0.69	12,954
11/5/2018 14:35	11/5/2018 15:30	0.9	0.04	0.04	0.24	22.6	11/5/2018 14:35	11/6/2018 0:10	9.7	0.15	0.27	5,115
11/6/2018 0:10	11/6/2018 0:50	0.7	0.05	0.08	0.12	9.6	11/6/2018 0:10	11/6/2018 12:45	12.7	0.13	0.17	6,096
11/9/2018 9:50	11/9/2018 11:40	1.8	0.08	0.04	0.12	81.4	11/9/2018 9:45	11/9/2018 23:35	13.9	0.14	0.20	6,972
11/13/2018 23:35	11/14/2018 8:30	8.9	0.11	0.01	0.24	108.6	11/13/2018 23:35	11/14/2018 20:25	20.9	0.15	0.22	10,947
11/16/2018 1:15	11/16/2018 5:25	4.2	0.07	0.02	0.12	41.4	11/16/2018 1:15	11/16/2018 17:25	16.3	0.17	0.17	9,945
11/21/2018 21:40	11/22/2018 4:30	6.8	0.13	0.02	0.12	139.9	11/21/2018 21:40	11/22/2018 11:45	14.2	0.15	0.22	7,617
11/22/2018 11:45	11/23/2018 21:50	34.1	1.21	0.04	0.48	8.1	11/22/2018 11:45	11/24/2018 9:50	46.2	0.21	0.58	34,653
11/26/2018 4:20	11/27/2018 6:20	26.0	1.38	0.05	0.24	56.2	11/26/2018 4:15	11/27/2018 14:45	34.6	0.30	0.58	37,629
11/27/2018 14:50	11/27/2018 20:20	5.5	0.30	0.05	0.36	8.9	11/27/2018 14:45	11/28/2018 3:55	13.3	0.23	0.58	11,130
11/28/2018 3:55	11/28/2018 4:55	1.0	0.16	0.16	0.24	9.4	11/28/2018 3:55	11/28/2018 11:10	7.3	0.26	0.58	6,918
11/28/2018 11:10	11/28/2018 17:45	6.6	0.06	0.01	0.12	6.4	11/28/2018 11:10	11/29/2018 5:45	18.7	0.18	0.20	11,901
11/30/2018 19:10	11/30/2018 22:55	3.8	0.19	0.05	0.12	52.2	11/30/2018 19:05	12/1/2018 10:50	15.8	0.14	0.30	8,004
12/1/2018 11:15	12/1/2018 15:55	4.7	0.03	0.01	0.12	13.8	12/1/2018 11:10	12/2/2018 3:55	16.8	0.11	0.12	6,594
12/9/2018 9:15	12/9/2018 20:40	11.4	0.64	0.06	0.12	203.8	12/9/2018 9:10	12/10/2018 8:00	22.9	0.18	0.34	14,709
12/10/2018 8:00	12/10/2018 11:05	3.1	0.05	0.02	0.24	11.8	12/10/2018 8:00	12/10/2018 23:00	15.1	0.12	0.27	6,663
12/11/2018 3:00	12/12/2018 0:25	21.4	0.53	0.02	0.24	16.1	12/11/2018 2:55	12/12/2018 12:20	33.5	0.16	0.54	18,720
12/12/2018 18:40	12/13/2018 16:35	21.9	0.17	0.01	0.12	20.2	12/12/2018 18:40	12/14/2018 4:30	33.9	0.11	0.13	13,134
12/15/2018 22:45	12/16/2018 8:40	9.9	0.29	0.03	0.24	56.7	12/15/2018 22:40	12/16/2018 14:15	15.7	0.13	0.22	7,113
12/16/2018 14:20	12/16/2018 21:45	7.4	0.22	0.03	0.24	9.4	12/16/2018 14:15	12/17/2018 5:15	15.1	0.14	0.34	7,623
12/17/2018 5:20	12/17/2018 5:55	0.6	0.03	0.05	0.12	7.8	12/17/2018 5:15	12/17/2018 16:50	11.7	0.12	0.15	4,959
12/17/2018 16:50	12/18/2018 8:05	15.3	0.59	0.04	0.24	19.2	12/17/2018 16:50	12/18/2018 13:30	20.8	0.23	0.49	16,818
12/18/2018 13:35	12/19/2018 0:00	10.4	0.29	0.03	0.36	7.3	12/18/2018 13:30	12/19/2018 12:00	22.6	0.17	0.58	14,034
12/20/2018 1:55	12/20/2018 16:05	14.2	0.23	0.02	0.24	31.7	12/20/2018 1:50	12/21/2018 4:05	26.3	0.13	0.37	12,225
12/22/2018 17:45	12/23/2018 14:05	20.3	0.80	0.04	0.36	55.0	12/22/2018 17:45	12/24/2018 2:00	32.3	0.19	0.58	22,107
12/26/2018 9:10	12/26/2018 11:40	2.5	0.06	0.02	0.12	72.2	12/26/2018 9:10	12/26/2018 23:35	14.5	0.09	0.10	4,713
12/27/2018 1:35	12/27/2018 5:55	4.3	0.09	0.02	0.24	15.0	12/27/2018 1:35	12/27/2018 17:55	16.4	0.09	0.13	5,517
12/28/2018 4:50	12/28/2018 21:35	16.8	0.67	0.04	0.24	26.8	12/28/2018 4:50	12/29/2018 9:30	28.8	0.18	0.37	19,125

Table D-12. Summary Statistics for Individual Storm Events at the COUMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
12/29/2018 12:55	12/30/2018 2:30	13.6	0.68	0.05	0.36	16.2	12/29/2018 12:55	12/30/2018 14:25	25.6	0.25	0.54	23,469
1/2/2019 23:50	1/4/2019 6:55	31.1	0.95	0.03	0.36	93.4	1/2/2019 23:45	1/4/2019 14:55	39.3	0.17	0.37	24,471
1/4/2019 14:55	1/4/2019 18:00	3.1	0.03	0.01	0.12	10.2	1/4/2019 14:55	1/5/2019 5:55	15.1	0.12	0.15	6,762
1/5/2019 17:25	1/6/2019 2:50	9.4	0.20	0.02	0.24	36.8	1/5/2019 17:25	1/6/2019 14:45	21.4	0.11	0.17	8,532
1/6/2019 17:00	1/7/2019 0:55	7.9	0.53	0.07	0.24	15.0	1/6/2019 17:00	1/7/2019 12:55	20.0	0.21	0.49	15,051
1/8/2019 8:50	1/10/2019 9:55	49.1	0.49	0.01	0.12	34.7	1/8/2019 8:45	1/10/2019 10:40	50.0	0.11	0.17	20,322
1/10/2019 10:40	1/10/2019 13:35	2.9	0.03	0.01	0.12	9.1	1/10/2019 10:40	1/11/2019 1:30	14.9	0.09	0.12	5,064
1/17/2019 1:55	1/17/2019 3:15	1.3	0.10	0.08	0.12	160.0	1/17/2019 1:50	1/17/2019 15:10	13.4	0.11	0.20	5,253
1/17/2019 17:20	1/17/2019 22:45	5.4	0.03	0.01	0.12	14.6	1/17/2019 17:15	1/18/2019 4:15	11.1	0.09	0.09	3,591
1/18/2019 4:15	1/18/2019 5:35	1.3	0.07	0.05	0.12	25.5	1/18/2019 4:15	1/18/2019 17:35	13.4	0.12	0.20	5,880
1/18/2019 18:30	1/19/2019 2:20	7.8	0.23	0.03	0.24	13.4	1/18/2019 18:30	1/19/2019 13:40	19.3	0.19	0.34	12,840
1/19/2019 13:40	1/19/2019 16:40	3.0	0.04	0.01	0.24	15.2	1/19/2019 13:40	1/20/2019 4:40	15.1	0.15	0.20	8,283
1/22/2019 13:35	1/23/2019 9:30	19.9	0.82	0.04	0.36	71.9	1/22/2019 13:30	1/23/2019 21:30	32.1	0.26	0.63	29,772
1/24/2019 2:45	1/24/2019 8:10	5.4	0.03	0.01	0.12	18.6	1/24/2019 2:45	1/24/2019 20:10	17.5	0.16	0.17	10,050
2/1/2019 4:40	2/1/2019 21:55	17.3	0.66	0.04	0.12	212.5	2/1/2019 4:40	2/2/2019 9:55	29.3	0.18	0.30	18,642
2/5/2019 11:00	2/5/2019 14:55	3.9	0.20	0.05	0.24	87.8	2/5/2019 11:00	2/6/2019 2:55	16.0	0.10	0.12	5,772
2/6/2019 10:45	2/6/2019 15:15	4.5	0.17	0.04	0.24	20.5	2/6/2019 10:40	2/7/2019 3:10	16.6	0.09	0.09	5,373
2/7/2019 11:10	2/7/2019 11:20	0.2	0.04	0.24	0.24	20.5	2/7/2019 11:10	2/7/2019 23:15	12.2	0.09	0.09	3,942
2/9/2019 14:20	2/9/2019 15:35	1.3	0.03	0.02	0.12	51.2	2/9/2019 14:15	2/10/2019 3:30	13.3	0.09	0.10	4,347
2/13/2019 11:15	2/13/2019 13:20	2.1	0.20	0.10	0.24	144.1	2/13/2019 11:10	2/14/2019 1:20	14.3	0.36	0.41	18,621
2/14/2019 8:45	2/14/2019 21:15	12.5	0.68	0.05	0.12	19.7	2/14/2019 8:45	2/15/2019 9:10	24.5	0.36	0.45	31,371
2/16/2019 8:50	2/16/2019 22:25	13.6	0.36	0.03	0.24	36.8	2/16/2019 8:45	2/17/2019 10:25	25.8	0.39	0.69	36,279
2/19/2019 13:25	2/20/2019 2:55	13.5	0.43	0.03	0.24	64.5	2/19/2019 13:25	2/20/2019 14:55	25.6	0.35	0.74	32,403
2/22/2019 12:15	2/22/2019 15:55	3.7	0.28	0.08	0.24	59.8	2/22/2019 12:10	2/23/2019 3:55	15.8	0.28	0.54	16,032
2/23/2019 12:35	2/23/2019 20:45	8.2	0.21	0.03	0.36	21.8	2/23/2019 12:30	2/24/2019 8:45	20.3	0.29	0.74	21,201
3/6/2019 14:45	3/6/2019 19:20	4.6	0.08	0.02	0.12	258.3	3/6/2019 14:45	3/7/2019 7:20	16.7	0.08	0.09	4,983
3/7/2019 9:05	3/7/2019 16:05	7.0	0.18	0.03	0.24	15.9	3/7/2019 9:00	3/8/2019 4:05	19.2	0.10	0.13	6,831
3/8/2019 8:25	3/8/2019 9:55	1.5	0.12	0.08	0.24	22.1	3/8/2019 8:25	3/8/2019 21:55	13.6	0.10	0.13	4,896
3/11/2019 17:40	3/12/2019 20:35	26.9	1.17	0.04	0.24	80.0	3/11/2019 17:35	3/13/2019 8:35	39.1	0.23	0.58	32,103
3/25/2019 17:00	3/26/2019 7:35	14.6	0.27	0.02	0.12	308.8	3/25/2019 17:00	3/26/2019 19:30	26.6	0.10	0.25	9,402
4/3/2019 1:20	4/3/2019 8:45	7.4	0.06	0.01	0.12	191.8	4/3/2019 1:20	4/3/2019 20:45	19.5	0.08	0.10	5,637
4/4/2019 21:25	4/5/2019 3:55	6.5	0.21	0.03	0.12	40.4	4/4/2019 21:20	4/5/2019 11:00	13.8	0.11	0.17	5,232
4/5/2019 11:00	4/5/2019 17:35	6.6	0.32	0.05	0.48	7.6	4/5/2019 11:00	4/6/2019 5:35	18.7	0.13	0.34	8,973
4/6/2019 6:05	4/6/2019 12:55	6.8	0.10	0.01	0.24	14.8	4/6/2019 6:00	4/6/2019 21:55	16.0	0.10	0.13	5,835
4/6/2019 21:55	4/7/2019 4:45	6.8	0.41	0.06	0.12	13.0	4/6/2019 21:55	4/7/2019 16:40	18.8	0.17	0.30	11,754
4/8/2019 17:15	4/9/2019 13:00	19.8	0.55	0.03	0.48	37.7	4/8/2019 17:10	4/10/2019 1:00	31.9	0.20	0.74	23,454
4/10/2019 10:35	4/11/2019 13:50	27.3	0.54	0.02	0.24	23.3	4/10/2019 10:30	4/11/2019 21:55	35.5	0.21	0.37	27,438
4/11/2019 21:55	4/12/2019 6:35	8.7	0.36	0.04	0.24	9.2	4/11/2019 21:55	4/12/2019 18:30	20.7	0.28	0.69	20,901
4/13/2019 5:30	4/13/2019 15:40	10.2	0.26	0.03	0.12	27.2	4/13/2019 5:30	4/14/2019 3:40	22.3	0.21	0.30	16,917
4/14/2019 18:55	4/14/2019 21:25	2.5	0.04	0.02	0.12	28.1	4/14/2019 18:55	4/15/2019 9:20	14.5	0.15	0.15	7,590
4/16/2019 16:55	4/16/2019 19:40	2.8	0.14	0.05	0.12	46.0	4/16/2019 16:50	4/17/2019 7:40	14.9	0.14	0.25	7,695
4/18/2019 4:55	4/18/2019 7:25	2.5	0.12	0.05	0.12	34.0	4/18/2019 4:50	4/18/2019 17:55	13.2	0.14	0.27	6,552
4/18/2019 17:55	4/18/2019 22:45	4.8	0.10	0.02	0.12	11.2	4/18/2019 17:55	4/19/2019 4:40	10.8	0.15	0.30	5,817
4/19/2019 4:40	4/19/2019 22:45	18.1	0.26	0.01	0.12	9.1	4/19/2019 4:40	4/20/2019 10:40	30.1	0.17	0.27	17,946

Table D-12. Summary Statistics for Individual Storm Events at the COUMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
4/22/2019 11:00	4/22/2019 17:20	6.3	0.22	0.03	0.24	64.7	4/22/2019 11:00	4/23/2019 5:15	18.3	0.13	0.22	8,442
5/14/2019 8:05	5/14/2019 14:50	6.8	0.06	0.01	0.12	519.4	5/14/2019 8:05	5/15/2019 2:45	18.8	0.06	0.09	4,059
5/15/2019 15:45	5/15/2019 19:45	4.0	0.10	0.03	0.12	30.6	5/15/2019 15:40	5/16/2019 7:40	16.1	0.07	0.10	4,302
5/16/2019 13:35	5/17/2019 7:15	17.7	0.78	0.04	0.24	19.2	5/16/2019 13:30	5/17/2019 19:15	29.8	0.15	0.45	16,278
5/20/2019 9:35	5/20/2019 22:45	13.2	0.43	0.03	0.12	77.3	5/20/2019 9:30	5/21/2019 10:40	25.3	0.12	0.25	10,854
5/25/2019 11:10	5/25/2019 17:00	5.8	0.24	0.04	0.12	110.2	5/25/2019 11:10	5/26/2019 5:00	17.9	0.11	0.17	6,957
6/6/2019 14:40	6/6/2019 18:25	3.8	0.19	0.05	0.48	286.8	6/6/2019 14:35	6/7/2019 6:20	15.8	0.09	0.17	5,262
6/19/2019 15:45	6/20/2019 3:00	11.3	0.59	0.05	0.36	310.2	6/19/2019 15:40	6/20/2019 14:55	23.3	0.15	0.58	12,429
6/23/2019 5:50	6/23/2019 7:25	1.6	0.05	0.03	0.12	76.2	6/23/2019 5:45	6/23/2019 19:25	13.8	0.08	0.09	3,864
6/24/2019 0:25	6/24/2019 3:40	3.3	0.06	0.02	0.12	18.2	6/24/2019 0:20	6/24/2019 15:40	15.4	0.08	0.09	4,431
6/27/2019 2:00	6/27/2019 6:30	4.5	0.06	0.01	0.12	72.7	6/27/2019 2:00	6/27/2019 18:30	16.6	0.07	0.10	4,389
7/2/2019 12:40	7/2/2019 21:05	8.4	0.08	0.01	0.12	130.3	7/2/2019 12:40	7/3/2019 1:50	13.3	0.10	0.20	4,569
7/3/2019 1:55	7/3/2019 7:50	5.9	0.10	0.02	0.12	13.2	7/3/2019 1:50	7/3/2019 19:50	18.1	0.10	0.13	6,228
7/7/2019 20:25	7/7/2019 22:05	1.7	0.08	0.05	0.12	112.8	7/7/2019 20:25	7/8/2019 10:05	13.8	0.10	0.12	4,848
7/9/2019 20:50	7/10/2019 18:10	21.3	0.30	0.01	0.12	47.6	7/9/2019 20:45	7/11/2019 6:10	33.5	0.12	0.25	14,184
7/15/2019 9:35	7/15/2019 12:10	2.6	0.05	0.02	0.12	115.0	7/15/2019 9:30	7/16/2019 0:10	14.8	0.10	0.13	5,403
7/16/2019 2:30	7/16/2019 4:45	2.3	0.29	0.13	0.84	15.3	7/16/2019 2:25	7/16/2019 16:40	14.3	0.14	0.69	7,335
7/17/2019 5:20	7/17/2019 11:40	6.3	0.10	0.02	0.24	25.0	7/17/2019 5:15	7/17/2019 13:40	8.5	0.10	0.15	3,135
7/17/2019 13:45	7/17/2019 15:45	2.0	0.04	0.02	0.12	6.8	7/17/2019 13:40	7/17/2019 22:05	8.5	0.09	0.12	2,833
7/17/2019 22:05	7/18/2019 2:00	3.9	0.16	0.04	0.36	8.3	7/17/2019 22:05	7/18/2019 14:00	16.0	0.11	0.27	6,528
7/18/2019 17:50	7/19/2019 4:35	10.8	0.65	0.06	0.48	17.5	7/18/2019 17:45	7/19/2019 16:30	22.8	0.16	0.45	12,990
8/2/2019 2:55	8/2/2019 4:35	1.7	0.28	0.17	0.48	338.7	8/2/2019 2:55	8/2/2019 16:30	13.7	0.06	0.30	3,168
8/10/2019 3:55	8/10/2019 8:40	4.8	0.72	0.15	0.48	191.9	8/10/2019 3:55	8/10/2019 20:40	16.8	0.12	0.45	7,440
8/11/2019 7:25	8/11/2019 8:15	0.8	0.10	0.12	0.24	23.2	8/11/2019 7:25	8/11/2019 20:10	12.8	0.06	0.22	2,847
8/21/2019 5:15	8/21/2019 8:25	3.2	0.11	0.03	0.24	237.4	8/21/2019 5:10	8/21/2019 16:05	11.0	0.05	0.15	1,839
8/21/2019 16:05	8/21/2019 21:20	5.3	0.11	0.02	0.24	8.4	8/21/2019 16:05	8/22/2019 9:20	17.3	0.04	0.08	2,652
8/29/2019 18:00	8/29/2019 23:30	5.5	0.24	0.04	0.36	189.7	8/29/2019 17:55	8/30/2019 11:25	17.6	0.06	0.15	4,092
9/7/2019 19:35	9/7/2019 22:05	2.5	0.56	0.22	0.84	212.7	9/7/2019 19:30	9/8/2019 5:35	10.2	0.11	0.45	4,020
9/8/2019 5:35	9/8/2019 9:55	4.3	0.07	0.02	0.12	8.5	9/8/2019 5:35	9/8/2019 14:55	9.4	0.04	0.05	1,455
9/8/2019 14:55	9/8/2019 15:05	0.2	0.07	0.42	0.60	8.4	9/8/2019 14:55	9/8/2019 21:10	6.3	0.04	0.04	912
9/8/2019 21:15	9/9/2019 18:15	21.0	0.99	0.05	1.08	6.2	9/8/2019 21:10	9/10/2019 6:10	33.1	0.10	0.58	12,258
9/12/2019 19:50	9/12/2019 22:10	2.3	0.28	0.12	0.72	74.1	9/12/2019 19:50	9/13/2019 10:05	14.3	0.10	0.41	5,055
9/14/2019 20:05	9/15/2019 11:05	15.0	0.64	0.04	0.24	46.3	9/14/2019 20:00	9/15/2019 23:00	27.1	0.11	0.41	10,809
9/16/2019 17:15	9/16/2019 19:15	2.0	0.03	0.02	0.12	31.0	9/16/2019 17:10	9/17/2019 2:45	9.7	0.06	0.08	2,001
9/17/2019 2:45	9/18/2019 5:05	26.3	0.72	0.03	0.60	40.5	9/17/2019 2:45	9/18/2019 17:00	38.3	0.10	0.41	14,079
9/22/2019 6:10	9/22/2019 23:20	17.2	0.38	0.02	0.24	97.8	9/22/2019 6:10	9/23/2019 11:00	28.9	0.06	0.12	5,961
9/23/2019 11:00	9/23/2019 16:30	5.5	0.09	0.02	0.12	14.3	9/23/2019 11:00	9/24/2019 4:25	17.5	0.05	0.10	3,423
9/26/2019 5:15	9/26/2019 8:00	2.8	0.11	0.04	0.12	63.3	9/26/2019 5:10	9/26/2019 20:00	14.9	0.06	0.09	3,393
9/27/2019 1:55	9/27/2019 5:40	3.8	0.40	0.11	0.48	18.8	9/27/2019 1:50	9/27/2019 13:25	11.7	0.17	0.54	7,056
9/27/2019 13:25	9/28/2019 1:00	11.6	0.19	0.02	0.36	8.5	9/27/2019 13:25	9/28/2019 12:55	23.6	0.10	0.58	8,430
9/29/2019 1:15	9/29/2019 4:25	3.2	0.04	0.01	0.12	31.2	9/29/2019 1:15	9/29/2019 16:25	15.3	0.06	0.08	3,378

Table D-13. Summary Statistics for Individual Storm Events at the TYLMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 8:00	10/1/2018 19:45	11.8	0.38	0.03	0.24	33.2	10/1/2018 8:00	10/2/2018 7:40	23.8	0.47	3.42	40,248
10/5/2018 8:50	10/5/2018 19:25	10.6	0.50	0.05	0.24	86.2	10/5/2018 8:50	10/6/2018 7:25	22.7	0.55	2.44	44,490
10/8/2018 3:05	10/8/2018 5:35	2.5	0.03	0.01	0.12	57.2	10/8/2018 3:00	10/8/2018 10:15	7.3	0.04	0.05	1,014
10/8/2018 10:20	10/9/2018 7:25	21.1	0.86	0.04	0.36	64.4	10/8/2018 10:15	10/9/2018 19:25	33.3	0.81	3.64	96,717
10/25/2018 7:20	10/26/2018 8:50	25.5	0.78	0.03	0.36	385.1	10/25/2018 7:15	10/26/2018 20:45	37.6	0.72	3.86	97,263
10/27/2018 15:00	10/28/2018 10:50	19.8	1.22	0.06	0.48	34.2	10/27/2018 14:55	10/28/2018 16:50	26.0	1.80	6.51	168,408
10/28/2018 16:55	10/28/2018 21:45	4.8	0.05	0.01	0.12	10.8	10/28/2018 16:50	10/29/2018 9:40	16.9	0.59	0.88	35,865
10/29/2018 13:50	10/29/2018 14:10	0.3	0.05	0.15	0.12	20.5	10/29/2018 13:50	10/30/2018 2:10	12.4	0.17	0.28	7,650
10/30/2018 20:05	10/31/2018 2:20	6.3	0.17	0.03	0.12	30.2	10/30/2018 20:00	10/31/2018 14:15	18.3	0.28	1.78	18,294
10/31/2018 16:05	10/31/2018 22:05	6.0	0.03	0.01	0.12	18.1	10/31/2018 16:05	11/1/2018 1:25	9.4	0.11	0.14	3,594
11/1/2018 1:30	11/1/2018 10:15	8.8	0.20	0.02	0.12	27.5	11/1/2018 1:25	11/1/2018 22:15	20.9	0.39	1.63	29,601
11/1/2018 23:30	11/2/2018 17:20	17.8	0.66	0.04	0.48	14.3	11/1/2018 23:25	11/3/2018 5:20	30.0	0.97	6.21	104,973
11/3/2018 8:55	11/3/2018 18:55	10.0	0.22	0.02	0.12	20.0	11/3/2018 8:55	11/4/2018 4:30	19.7	0.56	1.78	39,837
11/4/2018 4:35	11/4/2018 6:00	1.4	0.06	0.04	0.12	14.3	11/4/2018 4:30	11/4/2018 16:15	11.8	0.38	1.63	16,311
11/4/2018 16:15	11/4/2018 18:30	2.3	0.12	0.05	0.84	11.5	11/4/2018 16:15	11/5/2018 6:30	14.3	0.63	4.58	32,349
11/5/2018 18:00	11/5/2018 23:55	5.9	0.03	0.01	0.12	25.7	11/5/2018 17:55	11/6/2018 11:55	18.1	0.13	0.23	8,526
11/9/2018 9:50	11/9/2018 12:50	3.0	0.07	0.02	0.12	113.5	11/9/2018 9:45	11/10/2018 0:45	15.1	0.16	0.53	8,694
11/14/2018 5:25	11/14/2018 8:35	3.2	0.08	0.03	0.12	114.4	11/14/2018 5:25	11/14/2018 20:35	15.3	0.19	0.88	10,239
11/15/2018 23:45	11/16/2018 6:05	6.3	0.12	0.02	0.12	39.9	11/15/2018 23:45	11/16/2018 18:05	18.4	0.26	0.99	17,043
11/21/2018 21:45	11/22/2018 6:30	8.8	0.13	0.01	0.12	139.2	11/21/2018 21:40	11/22/2018 13:50	16.3	0.23	0.88	13,404
11/22/2018 13:50	11/23/2018 19:40	29.8	1.07	0.04	0.48	9.8	11/22/2018 13:50	11/24/2018 7:40	41.9	1.35	5.64	203,424
11/26/2018 4:10	11/27/2018 6:15	26.1	1.50	0.06	0.24	61.3	11/26/2018 4:05	11/27/2018 14:55	34.9	2.01	4.58	252,075
11/27/2018 14:55	11/27/2018 20:20	5.4	0.39	0.07	0.72	9.0	11/27/2018 14:55	11/28/2018 3:55	13.1	1.75	5.36	82,203
11/28/2018 4:00	11/28/2018 11:20	7.3	0.22	0.03	0.36	8.5	11/28/2018 3:55	11/28/2018 14:15	10.4	1.53	5.09	57,438
11/28/2018 14:20	11/28/2018 17:40	3.3	0.06	0.02	0.12	8.6	11/28/2018 14:15	11/29/2018 5:35	15.4	0.91	1.23	50,778
11/30/2018 19:20	11/30/2018 21:55	2.6	0.20	0.08	0.24	52.3	11/30/2018 19:15	12/1/2018 8:15	13.1	0.62	2.44	29,070
12/1/2018 8:20	12/1/2018 12:25	4.1	0.03	0.01	0.12	10.9	12/1/2018 8:15	12/2/2018 0:20	16.2	0.24	0.39	13,710
12/9/2018 9:30	12/10/2018 2:20	16.8	0.66	0.04	0.12	204.1	12/9/2018 9:30	12/10/2018 14:20	28.9	0.87	2.26	90,189
12/11/2018 3:35	12/11/2018 22:35	19.0	0.61	0.03	0.96	31.8	12/11/2018 3:30	12/12/2018 10:30	31.1	0.86	4.33	96,753
12/12/2018 20:50	12/13/2018 6:55	10.1	0.08	0.01	0.12	24.1	12/12/2018 20:50	12/13/2018 10:50	14.1	0.37	0.60	18,651
12/13/2018 10:55	12/13/2018 16:05	5.2	0.03	0.01	0.12	13.4	12/13/2018 10:50	12/14/2018 4:05	17.3	0.32	0.46	19,860
12/15/2018 22:55	12/16/2018 6:25	7.5	0.31	0.04	0.12	73.4	12/15/2018 22:50	12/16/2018 14:15	15.5	0.55	1.78	30,936
12/16/2018 14:20	12/16/2018 21:45	7.4	0.21	0.03	0.36	10.1	12/16/2018 14:15	12/17/2018 5:25	15.3	0.55	1.78	30,069
12/17/2018 5:30	12/17/2018 6:10	0.7	0.03	0.05	0.12	8.0	12/17/2018 5:25	12/17/2018 17:15	11.9	0.35	0.53	15,214
12/17/2018 17:20	12/18/2018 8:05	14.8	0.53	0.04	0.24	19.8	12/17/2018 17:15	12/18/2018 13:30	20.3	1.00	3.01	72,870
12/18/2018 13:35	12/18/2018 18:20	4.8	0.32	0.07	0.48	7.2	12/18/2018 13:30	12/19/2018 6:20	16.9	1.34	5.09	81,422
12/20/2018 1:55	12/20/2018 10:50	8.9	0.21	0.02	0.24	31.9	12/20/2018 1:50	12/20/2018 22:50	21.1	0.66	1.93	49,869
12/22/2018 17:50	12/23/2018 13:25	19.6	0.78	0.04	0.36	55.4	12/22/2018 17:45	12/24/2018 1:25	31.8	1.27	4.09	144,738
12/26/2018 9:25	12/26/2018 11:45	2.3	0.05	0.02	0.12	72.7	12/26/2018 9:20	12/26/2018 23:45	14.5	0.35	0.53	18,504
12/27/2018 2:35	12/27/2018 3:05	0.5	0.05	0.10	0.36	16.2	12/27/2018 2:35	12/27/2018 15:00	12.5	0.36	0.78	16,062
12/28/2018 5:05	12/28/2018 21:35	16.5	0.72	0.04	0.24	26.1	12/28/2018 5:00	12/29/2018 9:30	28.6	1.43	3.21	146,823
12/29/2018 13:05	12/30/2018 3:00	13.9	1.02	0.07	0.60	16.6	12/29/2018 13:05	12/30/2018 15:00	26.0	2.22	5.92	208,179
1/2/2019 23:55	1/4/2019 7:00	31.1	1.07	0.03	0.36	93.6	1/2/2019 23:55	1/4/2019 15:20	39.5	1.62	5.92	230,655

Table D-13. Summary Statistics for Individual Storm Events at the TYLMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
1/4/2019 15:25	1/4/2019 18:50	3.4	0.03	0.01	0.12	10.8	1/4/2019 15:20	1/5/2019 6:50	15.6	0.89	1.35	49,881
1/5/2019 21:55	1/6/2019 3:05	5.2	0.19	0.04	0.24	41.3	1/5/2019 21:55	1/6/2019 15:00	17.2	0.81	1.93	50,247
1/6/2019 17:20	1/7/2019 0:05	6.8	0.47	0.07	0.24	15.2	1/6/2019 17:15	1/7/2019 12:00	18.8	1.53	3.86	103,914
1/8/2019 8:45	1/10/2019 10:00	49.3	0.57	0.01	0.24	34.8	1/8/2019 8:45	1/10/2019 10:35	49.9	0.77	1.78	138,012
1/10/2019 10:35	1/10/2019 13:35	3.0	0.04	0.01	0.12	6.3	1/10/2019 10:35	1/11/2019 1:30	15.0	0.60	0.88	32,529
1/17/2019 2:15	1/17/2019 3:20	1.1	0.08	0.07	0.12	159.7	1/17/2019 2:10	1/17/2019 15:20	13.3	0.25	1.11	12,045
1/18/2019 18:45	1/19/2019 2:25	7.7	0.16	0.02	0.24	39.8	1/18/2019 18:40	1/19/2019 14:25	19.8	0.39	1.78	27,774
1/22/2019 13:45	1/23/2019 9:45	20.0	0.85	0.04	0.24	88.3	1/22/2019 13:40	1/23/2019 21:40	32.1	1.30	3.86	149,880
2/1/2019 4:40	2/1/2019 21:45	17.1	0.64	0.04	0.12	212.8	2/1/2019 4:40	2/2/2019 9:40	29.1	0.89	2.26	93,483
2/5/2019 11:55	2/5/2019 14:40	2.8	0.18	0.07	0.36	89.2	2/5/2019 11:55	2/6/2019 2:40	14.8	0.26	0.39	13,653
2/9/2019 13:55	2/9/2019 17:00	3.1	0.17	0.06	0.12	97.2	2/9/2019 13:50	2/10/2019 5:00	15.3	0.19	0.23	10,623
2/11/2019 12:00	2/11/2019 16:10	4.2	0.11	0.03	0.12	44.2	2/11/2019 11:55	2/12/2019 4:05	16.3	0.20	0.78	11,823
2/12/2019 11:35	2/13/2019 13:45	26.2	0.98	0.04	0.12	21.8	2/12/2019 11:35	2/14/2019 1:40	38.2	0.73	1.11	100,788
2/14/2019 8:55	2/14/2019 20:25	11.5	0.25	0.02	0.24	19.5	2/14/2019 8:55	2/15/2019 8:25	23.6	1.13	2.09	96,129
2/16/2019 8:00	2/16/2019 22:20	14.3	0.45	0.03	0.12	36.6	2/16/2019 8:00	2/17/2019 10:20	26.4	1.75	3.21	166,833
2/19/2019 13:35	2/20/2019 3:25	13.8	0.31	0.02	0.12	64.8	2/19/2019 13:30	2/20/2019 15:20	25.9	1.06	2.09	98,979
2/22/2019 8:35	2/22/2019 16:40	8.1	0.22	0.03	0.24	55.8	2/22/2019 8:35	2/23/2019 4:40	20.2	0.65	2.44	47,232
2/23/2019 13:55	2/23/2019 23:25	9.5	0.23	0.02	0.48	23.6	2/23/2019 13:50	2/24/2019 11:25	21.7	0.78	3.01	61,116
3/6/2019 13:20	3/6/2019 19:20	6.0	0.10	0.02	0.12	256.8	3/6/2019 13:15	3/7/2019 7:20	18.2	0.14	0.28	8,910
3/7/2019 9:15	3/7/2019 11:10	1.9	0.21	0.11	0.24	16.2	3/7/2019 9:10	3/7/2019 23:10	14.1	0.37	1.11	18,633
3/8/2019 8:25	3/8/2019 10:20	1.9	0.13	0.07	0.24	21.4	3/8/2019 8:25	3/8/2019 22:20	14.0	0.36	1.63	18,132
3/11/2019 17:40	3/12/2019 20:35	26.9	1.28	0.05	0.36	79.5	3/11/2019 17:35	3/13/2019 8:35	39.1	1.66	4.58	233,891
3/25/2019 17:15	3/26/2019 4:25	11.2	0.25	0.02	0.24	309.0	3/25/2019 17:10	3/26/2019 16:25	23.3	0.29	1.63	24,705
4/3/2019 3:40	4/3/2019 9:40	6.0	0.10	0.02	0.24	194.5	4/3/2019 3:40	4/3/2019 21:40	18.1	0.13	0.28	8,682
4/4/2019 21:35	4/5/2019 4:30	6.9	0.18	0.03	0.12	37.0	4/4/2019 21:30	4/5/2019 11:45	14.3	0.26	1.11	13,467
4/5/2019 11:45	4/5/2019 18:15	6.5	0.32	0.05	0.60	8.1	4/5/2019 11:45	4/6/2019 6:10	18.5	0.54	3.01	36,279
4/6/2019 6:10	4/6/2019 13:00	6.8	0.16	0.02	0.24	14.9	4/6/2019 6:10	4/6/2019 22:05	16.0	0.35	1.11	20,058
4/6/2019 22:05	4/7/2019 4:25	6.3	0.32	0.05	0.12	9.2	4/6/2019 22:05	4/7/2019 16:25	18.4	0.68	1.63	44,907
4/8/2019 17:20	4/9/2019 12:00	18.7	0.32	0.02	0.36	37.8	4/8/2019 17:15	4/10/2019 0:00	30.8	0.45	2.26	49,557
4/10/2019 10:35	4/11/2019 6:50	20.3	0.34	0.02	0.24	23.4	4/10/2019 10:30	4/11/2019 11:55	25.5	0.50	1.35	46,272
4/11/2019 12:00	4/11/2019 14:25	2.4	0.04	0.02	0.12	7.2	4/11/2019 11:55	4/11/2019 20:00	8.2	0.48	0.88	14,088
4/11/2019 20:00	4/12/2019 5:40	9.7	0.34	0.04	0.24	8.0	4/11/2019 20:00	4/12/2019 17:35	21.7	0.79	3.42	61,788
4/13/2019 5:45	4/13/2019 15:20	9.6	0.25	0.03	0.12	28.1	4/13/2019 5:45	4/14/2019 3:20	21.7	0.52	1.35	40,401
4/16/2019 17:05	4/16/2019 19:20	2.3	0.10	0.04	0.12	78.3	4/16/2019 17:00	4/17/2019 7:15	14.3	0.20	0.69	10,512
4/18/2019 5:50	4/18/2019 7:20	1.5	0.10	0.07	0.24	35.2	4/18/2019 5:50	4/18/2019 18:40	12.9	0.32	1.78	14,676
4/18/2019 18:45	4/18/2019 19:50	1.1	0.07	0.06	0.12	12.1	4/18/2019 18:40	4/19/2019 4:05	9.5	0.23	0.88	7,725
4/19/2019 4:05	4/19/2019 16:00	11.9	0.13	0.01	0.12	8.8	4/19/2019 4:05	4/20/2019 3:55	23.9	0.29	1.23	25,203
4/22/2019 10:50	4/22/2019 17:45	6.9	0.26	0.04	0.12	68.8	4/22/2019 10:50	4/23/2019 5:45	19.0	0.50	2.09	34,065
5/14/2019 8:30	5/14/2019 12:30	4.0	0.05	0.01	0.12	519.6	5/14/2019 8:30	5/15/2019 0:30	16.1	0.04	0.08	2,595
5/15/2019 16:40	5/15/2019 19:30	2.8	0.06	0.02	0.12	31.7	5/15/2019 16:40	5/16/2019 7:30	14.9	0.06	0.11	3,093
5/16/2019 10:50	5/17/2019 6:25	19.6	0.83	0.04	0.24	17.1	5/16/2019 10:50	5/17/2019 18:20	31.6	0.72	3.21	82,278
5/20/2019 9:30	5/20/2019 22:40	13.2	0.31	0.02	0.12	77.2	5/20/2019 9:30	5/21/2019 10:40	25.3	0.33	1.35	29,985
5/24/2019 8:55	5/24/2019 10:20	1.4	0.03	0.02	0.12	83.7	5/24/2019 8:55	5/24/2019 22:15	13.4	0.08	0.11	3,963
5/25/2019 12:00	5/25/2019 16:25	4.4	0.16	0.04	0.12	110.8	5/25/2019 12:00	5/26/2019 4:25	16.5	0.24	0.88	14,238

Table D-13. Summary Statistics for Individual Storm Events at the TYLMO Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
6/6/2019 14:20	6/6/2019 18:10	3.8	0.08	0.02	0.36	286.8	6/6/2019 14:15	6/7/2019 6:10	16.0	0.12	0.99	7,035
6/7/2019 8:35	6/7/2019 12:30	3.9	0.03	0.01	0.12	15.7	6/7/2019 8:35	6/8/2019 0:30	16.0	0.05	0.08	3,132
6/19/2019 18:35	6/20/2019 2:55	8.3	0.70	0.08	0.72	313.7	6/19/2019 18:30	6/20/2019 14:55	20.5	0.62	3.64	45,561
6/23/2019 6:35	6/23/2019 8:30	1.9	0.04	0.02	0.12	77.1	6/23/2019 6:30	6/23/2019 20:25	14.0	0.05	0.11	2,436
6/23/2019 23:15	6/24/2019 2:45	3.5	0.04	0.01	0.12	16.7	6/23/2019 23:10	6/24/2019 14:45	15.7	0.05	0.08	2,733
6/27/2019 2:20	6/27/2019 6:55	4.6	0.04	0.01	0.12	75.1	6/27/2019 2:15	6/27/2019 18:55	16.8	0.05	0.08	2,757
7/2/2019 12:55	7/2/2019 21:15	8.3	0.13	0.02	0.12	130.6	7/2/2019 12:55	7/3/2019 4:15	15.4	0.10	0.53	5,610
7/3/2019 4:15	7/3/2019 9:50	5.6	0.13	0.02	0.12	9.1	7/3/2019 4:15	7/3/2019 21:45	17.6	0.14	0.69	8,556
7/9/2019 21:05	7/10/2019 15:00	17.9	0.25	0.01	0.12	157.4	7/9/2019 21:00	7/11/2019 6:30	33.6	0.13	0.69	15,285
7/16/2019 1:45	7/16/2019 7:10	5.4	0.52	0.10	1.20	132.0	7/16/2019 1:40	7/16/2019 19:05	17.5	0.58	5.92	36,447
7/17/2019 5:30	7/17/2019 7:55	2.4	0.09	0.04	0.12	26.2	7/17/2019 5:30	7/17/2019 19:50	14.4	0.14	0.46	7,059
7/17/2019 21:40	7/18/2019 7:30	9.8	0.28	0.03	0.48	15.0	7/17/2019 21:40	7/18/2019 19:10	21.6	0.45	4.09	35,169
7/18/2019 19:10	7/19/2019 4:35	9.4	0.25	0.03	0.12	17.1	7/18/2019 19:10	7/19/2019 16:30	21.4	0.44	2.62	33,558
8/2/2019 2:55	8/2/2019 4:40	1.8	0.33	0.19	0.96	340.0	8/2/2019 2:55	8/2/2019 16:40	13.8	0.34	3.64	16,803
8/10/2019 3:35	8/10/2019 8:25	4.8	0.71	0.15	0.72	191.7	8/10/2019 3:30	8/10/2019 20:25	17.0	0.86	4.83	52,716
8/11/2019 6:50	8/11/2019 11:55	5.1	0.05	0.01	0.12	22.8	8/11/2019 6:45	8/11/2019 23:55	17.3	0.13	0.28	7,824
8/21/2019 5:20	8/21/2019 8:30	3.2	0.09	0.03	0.24	238.2	8/21/2019 5:15	8/21/2019 17:35	12.4	0.10	0.99	4,449
8/21/2019 17:40	8/21/2019 21:55	4.3	0.06	0.01	0.12	10.1	8/21/2019 17:35	8/22/2019 9:55	16.4	0.07	0.18	4,209
8/29/2019 18:05	8/29/2019 23:30	5.4	0.18	0.03	0.36	189.9	8/29/2019 18:00	8/30/2019 11:25	17.5	0.13	1.49	8,499
9/7/2019 19:30	9/7/2019 21:35	2.1	0.72	0.35	0.96	215.8	9/7/2019 19:30	9/8/2019 5:30	10.1	1.25	5.64	45,474
9/8/2019 5:30	9/8/2019 9:25	3.9	0.09	0.02	0.12	8.3	9/8/2019 5:30	9/8/2019 14:55	9.5	0.53	0.99	17,982
9/8/2019 14:55	9/8/2019 21:00	6.1	0.48	0.08	2.64	8.2	9/8/2019 14:55	9/9/2019 1:50	11.0	0.97	7.44	38,445
9/9/2019 1:50	9/9/2019 21:45	19.9	2.20	0.11	2.40	10.7	9/9/2019 1:50	9/10/2019 9:40	31.9	1.83	14.94	210,685
9/12/2019 19:50	9/12/2019 22:10	2.3	0.21	0.09	0.48	73.9	9/12/2019 19:50	9/13/2019 10:05	14.3	0.22	1.23	11,595
9/14/2019 20:20	9/15/2019 14:20	18.0	0.68	0.04	0.24	46.4	9/14/2019 20:15	9/16/2019 2:15	30.1	0.49	3.42	52,734
9/16/2019 17:30	9/16/2019 19:20	1.8	0.04	0.02	0.36	30.7	9/16/2019 17:25	9/17/2019 7:05	13.8	0.04	0.05	2,085
9/17/2019 7:05	9/18/2019 10:50	27.8	0.63	0.02	0.72	13.6	9/17/2019 7:05	9/18/2019 22:50	39.8	0.36	3.86	51,702
9/22/2019 5:35	9/23/2019 0:05	18.5	0.54	0.03	0.24	90.9	9/22/2019 5:35	9/23/2019 11:00	29.5	0.33	2.09	34,578
9/23/2019 11:00	9/23/2019 14:30	3.5	0.10	0.03	0.12	11.8	9/23/2019 11:00	9/24/2019 1:15	14.3	0.20	0.69	10,179
9/24/2019 1:15	9/24/2019 9:40	8.4	0.10	0.01	0.12	11.6	9/24/2019 1:15	9/24/2019 21:40	20.5	0.12	0.33	8,517
9/26/2019 4:50	9/26/2019 8:25	3.6	0.17	0.05	0.12	44.8	9/26/2019 4:50	9/26/2019 20:25	15.7	0.29	1.23	16,176
9/27/2019 1:00	9/27/2019 4:10	3.2	0.09	0.03	0.12	17.8	9/27/2019 0:55	9/27/2019 10:25	9.6	0.30	1.11	10,182
9/27/2019 10:25	9/28/2019 0:00	13.6	0.23	0.02	0.72	7.2	9/27/2019 10:25	9/28/2019 11:55	25.6	0.27	3.21	24,867
9/29/2019 1:20	9/29/2019 3:55	2.6	0.08	0.03	0.24	30.9	9/29/2019 1:15	9/29/2019 15:55	14.8	0.05	0.08	2,649

Table D-14. Summary Statistics for Individual Storm Events at the TYLMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
10/1/2018 8:00	10/1/2018 19:45	11.8	0.38	0.03	0.24	33.2	10/1/2018 8:00	10/2/2018 7:40	23.8	0.14	0.23	11,874
10/5/2018 8:50	10/5/2018 19:25	10.6	0.50	0.05	0.24	86.2	10/5/2018 8:50	10/6/2018 7:25	22.7	0.16	0.23	13,437
10/8/2018 3:05	10/8/2018 5:35	2.5	0.03	0.01	0.12	57.2	10/8/2018 3:00	10/8/2018 10:15	7.3	0.04	0.04	954
10/8/2018 10:20	10/9/2018 7:25	21.1	0.86	0.04	0.36	64.4	10/8/2018 10:15	10/9/2018 19:25	33.3	0.33	0.54	39,183
10/25/2018 7:20	10/26/2018 8:50	25.5	0.78	0.03	0.36	385.1	10/25/2018 7:15	10/26/2018 20:45	37.6	0.25	0.54	33,429
10/27/2018 15:00	10/28/2018 10:50	19.8	1.22	0.06	0.48	34.2	10/27/2018 14:55	10/28/2018 16:50	26.0	0.79	1.19	73,548
10/28/2018 16:55	10/28/2018 21:45	4.8	0.05	0.01	0.12	10.8	10/28/2018 16:50	10/29/2018 9:40	16.9	0.58	0.80	35,046
10/29/2018 13:50	10/29/2018 14:10	0.3	0.05	0.15	0.12	20.5	10/29/2018 13:50	10/30/2018 2:10	12.4	0.07	0.10	3,297
10/30/2018 20:05	10/31/2018 2:20	6.3	0.17	0.03	0.12	30.2	10/30/2018 20:00	10/31/2018 14:15	18.3	0.11	0.23	7,236
10/31/2018 16:05	10/31/2018 22:05	6.0	0.03	0.01	0.12	18.1	10/31/2018 16:05	11/1/2018 1:25	9.4	0.06	0.07	2,031
11/1/2018 1:30	11/1/2018 10:15	8.8	0.20	0.02	0.12	27.5	11/1/2018 1:25	11/1/2018 22:15	20.9	0.14	0.28	10,884
11/1/2018 23:30	11/2/2018 17:20	17.8	0.66	0.04	0.48	14.3	11/1/2018 23:25	11/3/2018 5:20	30.0	0.47	0.80	50,874
11/3/2018 8:55	11/3/2018 18:55	10.0	0.22	0.02	0.12	20.0	11/3/2018 8:55	11/4/2018 4:30	19.7	0.27	0.40	19,461
11/4/2018 4:35	11/4/2018 6:00	1.4	0.06	0.04	0.12	14.3	11/4/2018 4:30	11/4/2018 16:15	11.8	0.16	0.28	6,660
11/4/2018 16:15	11/4/2018 18:30	2.3	0.12	0.05	0.84	11.5	11/4/2018 16:15	11/5/2018 6:30	14.3	0.35	0.47	18,237
11/5/2018 18:00	11/5/2018 23:55	5.9	0.03	0.01	0.12	25.7	11/5/2018 17:55	11/6/2018 11:55	18.1	0.07	0.10	4,533
11/9/2018 9:50	11/9/2018 12:50	3.0	0.07	0.02	0.12	113.5	11/9/2018 9:45	11/10/2018 0:45	15.1	0.04	0.10	2,355
11/14/2018 5:25	11/14/2018 8:35	3.2	0.08	0.03	0.12	114.4	11/14/2018 5:25	11/14/2018 20:35	15.3	0.05	0.12	2,676
11/15/2018 23:45	11/16/2018 6:05	6.3	0.12	0.02	0.12	39.9	11/15/2018 23:45	11/16/2018 18:05	18.4	0.07	0.15	4,611
11/21/2018 21:45	11/22/2018 6:30	8.8	0.13	0.01	0.12	139.2	11/21/2018 21:40	11/22/2018 13:50	16.3	0.05	0.12	3,102
11/22/2018 13:50	11/23/2018 19:40	29.8	1.07	0.04	0.48	9.8	11/22/2018 13:50	11/24/2018 7:40	41.9	0.67	0.99	101,439
11/26/2018 4:10	11/27/2018 6:15	26.1	1.50	0.06	0.24	61.3	11/26/2018 4:05	11/27/2018 14:55	34.9	1.00	1.94	126,066
11/27/2018 14:55	11/27/2018 20:20	5.4	0.39	0.07	0.72	9.0	11/27/2018 14:55	11/28/2018 3:55	13.1	1.23	1.42	58,062
11/28/2018 4:00	11/28/2018 11:20	7.3	0.22	0.03	0.36	8.5	11/28/2018 3:55	11/28/2018 14:15	10.4	1.19	1.34	44,676
11/28/2018 14:20	11/28/2018 17:40	3.3	0.06	0.02	0.12	8.6	11/28/2018 14:15	11/29/2018 5:35	15.4	0.93	1.05	51,459
11/30/2018 19:20	11/30/2018 21:55	2.6	0.20	0.08	0.24	52.3	11/30/2018 19:15	12/1/2018 8:15	13.1	0.32	0.40	15,267
12/1/2018 8:20	12/1/2018 12:25	4.1	0.03	0.01	0.12	10.9	12/1/2018 8:15	12/2/2018 0:20	16.2	0.12	0.23	7,170
12/9/2018 9:30	12/10/2018 2:20	16.8	0.66	0.04	0.12	204.1	12/9/2018 9:30	12/10/2018 14:20	28.9	0.50	0.74	52,185
12/11/2018 3:35	12/11/2018 22:35	19.0	0.61	0.03	0.96	31.8	12/11/2018 3:30	12/12/2018 10:30	31.1	0.41	0.86	45,750
12/12/2018 20:50	12/13/2018 6:55	10.1	0.08	0.01	0.12	24.1	12/12/2018 20:50	12/13/2018 10:50	14.1	0.18	0.19	9,225
12/13/2018 10:55	12/13/2018 16:05	5.2	0.03	0.01	0.12	13.4	12/13/2018 10:50	12/14/2018 4:05	17.3	0.15	0.15	9,360
12/15/2018 22:55	12/16/2018 6:25	7.5	0.31	0.04	0.12	73.4	12/15/2018 22:50	12/16/2018 14:15	15.5	0.26	0.40	14,457
12/16/2018 14:20	12/16/2018 21:45	7.4	0.21	0.03	0.36	10.1	12/16/2018 14:15	12/17/2018 5:25	15.3	0.41	0.63	22,665
12/17/2018 5:30	12/17/2018 6:10	0.7	0.03	0.05	0.12	8.0	12/17/2018 5:25	12/17/2018 17:15	11.9	0.26	0.33	11,013
12/17/2018 17:20	12/18/2018 8:05	14.8	0.53	0.04	0.24	19.8	12/17/2018 17:15	12/18/2018 13:30	20.3	0.76	1.12	55,887
12/18/2018 13:35	12/18/2018 18:20	4.8	0.32	0.07	0.48	7.2	12/18/2018 13:30	12/19/2018 6:20	16.9	0.97	1.19	58,887
12/20/2018 1:55	12/20/2018 10:50	8.9	0.21	0.02	0.24	31.9	12/20/2018 1:50	12/20/2018 22:50	21.1	0.34	0.54	26,145
12/22/2018 17:50	12/23/2018 13:25	19.6	0.78	0.04	0.36	55.4	12/22/2018 17:45	12/24/2018 1:25	31.8	0.77	1.42	88,050
12/26/2018 9:25	12/26/2018 11:45	2.3	0.05	0.02	0.12	72.7	12/26/2018 9:20	12/26/2018 23:45	14.5	0.10	0.12	5,262
12/27/2018 2:35	12/27/2018 3:05	0.5	0.05	0.10	0.36	16.2	12/27/2018 2:35	12/27/2018 15:00	12.5	0.11	0.12	4,938
12/28/2018 5:05	12/28/2018 21:35	16.5	0.72	0.04	0.24	26.1	12/28/2018 5:00	12/29/2018 9:30	28.6	0.76	1.27	78,021
12/29/2018 13:05	12/30/2018 3:00	13.9	1.02	0.07	0.60	16.6	12/29/2018 13:05	12/30/2018 15:00	26.0	1.60	2.22	150,198
1/2/2019 23:55	1/4/2019 7:00	31.1	1.07	0.03	0.36	93.6	1/2/2019 23:55	1/4/2019 15:20	39.5	0.81	1.85	115,563

Table D-14. Summary Statistics for Individual Storm Events at the TYLMI Station.

Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
1/4/2019 15:25	1/4/2019 18:50	3.4	0.03	0.01	0.12	10.8	1/4/2019 15:20	1/5/2019 6:50	15.6	0.58	0.74	32,475
1/5/2019 21:55	1/6/2019 3:05	5.2	0.19	0.04	0.24	41.3	1/5/2019 21:55	1/6/2019 15:00	17.2	0.45	0.54	27,849
1/6/2019 17:20	1/7/2019 0:05	6.8	0.47	0.07	0.24	15.2	1/6/2019 17:15	1/7/2019 12:00	18.8	0.83	1.12	56,244
1/8/2019 8:45	1/10/2019 10:00	49.3	0.57	0.01	0.24	34.8	1/8/2019 8:45	1/10/2019 10:35	49.9	0.47	0.63	84,735
1/10/2019 10:35	1/10/2019 13:35	3.0	0.04	0.01	0.12	6.3	1/10/2019 10:35	1/11/2019 1:30	15.0	0.49	0.54	26,262
1/17/2019 2:15	1/17/2019 3:20	1.1	0.08	0.07	0.12	159.7	1/17/2019 2:10	1/17/2019 15:20	13.3	0.07	0.10	3,429
1/18/2019 18:45	1/19/2019 2:25	7.7	0.16	0.02	0.24	39.8	1/18/2019 18:40	1/19/2019 14:25	19.8	0.11	0.12	7,980
1/22/2019 13:45	1/23/2019 9:45	20.0	0.85	0.04	0.24	88.3	1/22/2019 13:40	1/23/2019 21:40	32.1	0.72	1.19	83,013
2/1/2019 4:40	2/1/2019 21:45	17.1	0.64	0.04	0.12	212.8	2/1/2019 4:40	2/2/2019 9:40	29.1	0.36	0.54	38,007
2/5/2019 11:55	2/5/2019 14:40	2.8	0.18	0.07	0.36	89.2	2/5/2019 11:55	2/6/2019 2:40	14.8	0.10	0.10	5,088
2/9/2019 13:55	2/9/2019 17:00	3.1	0.17	0.06	0.12	97.2	2/9/2019 13:50	2/10/2019 5:00	15.3	0.07	0.07	3,630
2/11/2019 12:00	2/11/2019 16:10	4.2	0.11	0.03	0.12	44.2	2/11/2019 11:55	2/12/2019 4:05	16.3	0.07	0.28	4,236
2/12/2019 11:35	2/13/2019 13:45	26.2	0.98	0.04	0.12	21.8	2/12/2019 11:35	2/14/2019 1:40	38.2	0.27	0.47	37,587
2/14/2019 8:55	2/14/2019 20:25	11.5	0.25	0.02	0.24	19.5	2/14/2019 8:55	2/15/2019 8:25	23.6	0.38	0.63	32,247
2/16/2019 8:00	2/16/2019 22:20	14.3	0.45	0.03	0.12	36.6	2/16/2019 8:00	2/17/2019 10:20	26.4	0.90	1.42	85,296
2/19/2019 13:35	2/20/2019 3:25	13.8	0.31	0.02	0.12	64.8	2/19/2019 13:30	2/20/2019 15:20	25.9	0.83	1.05	77,736
2/22/2019 8:35	2/22/2019 16:40	8.1	0.22	0.03	0.24	55.8	2/22/2019 8:35	2/23/2019 4:40	20.2	0.53	0.74	38,481
2/23/2019 13:55	2/23/2019 23:25	9.5	0.23	0.02	0.48	23.6	2/23/2019 13:50	2/24/2019 11:25	21.7	0.77	0.92	59,763
3/6/2019 13:20	3/6/2019 19:20	6.0	0.10	0.02	0.12	256.8	3/6/2019 13:15	3/7/2019 7:20	18.2	0.03	0.04	1,995
3/7/2019 9:15	3/7/2019 11:10	1.9	0.21	0.11	0.24	16.2	3/7/2019 9:10	3/7/2019 23:10	14.1	0.08	0.10	4,140
3/8/2019 8:25	3/8/2019 10:20	1.9	0.13	0.07	0.24	21.4	3/8/2019 8:25	3/8/2019 22:20	14.0	0.11	0.12	5,391
3/11/2019 17:40	3/12/2019 20:35	26.9	1.28	0.05	0.36	79.5	3/11/2019 17:35	3/13/2019 8:35	39.1	0.72	1.42	101,994
3/25/2019 17:15	3/26/2019 4:25	11.2	0.25	0.02	0.24	309.0	3/25/2019 17:10	3/26/2019 16:25	23.3	0.04	0.06	3,501
4/3/2019 3:40	4/3/2019 9:40	6.0	0.10	0.02	0.24	194.5	4/3/2019 3:40	4/3/2019 21:40	18.1	0.04	0.04	2,442
4/4/2019 21:35	4/5/2019 4:30	6.9	0.18	0.03	0.12	37.0	4/4/2019 21:30	4/5/2019 11:45	14.3	0.05	0.06	2,565
4/5/2019 11:45	4/5/2019 18:15	6.5	0.32	0.05	0.60	8.1	4/5/2019 11:45	4/6/2019 6:10	18.5	0.13	0.15	8,886
4/6/2019 6:10	4/6/2019 13:00	6.8	0.16	0.02	0.24	14.9	4/6/2019 6:10	4/6/2019 22:05	16.0	0.12	0.15	7,128
4/6/2019 22:05	4/7/2019 4:25	6.3	0.32	0.05	0.12	9.2	4/6/2019 22:05	4/7/2019 16:25	18.4	0.26	0.40	17,223
4/8/2019 17:20	4/9/2019 12:00	18.7	0.32	0.02	0.36	37.8	4/8/2019 17:15	4/10/2019 0:00	30.8	0.17	0.28	19,392
4/10/2019 10:35	4/11/2019 6:50	20.3	0.34	0.02	0.24	23.4	4/10/2019 10:30	4/11/2019 11:55	25.5	0.20	0.33	18,249
4/11/2019 12:00	4/11/2019 14:25	2.4	0.04	0.02	0.12	7.2	4/11/2019 11:55	4/11/2019 20:00	8.2	0.25	0.28	7,428
4/11/2019 20:00	4/12/2019 5:40	9.7	0.34	0.04	0.24	8.0	4/11/2019 20:00	4/12/2019 17:35	21.7	0.47	0.74	36,852
4/13/2019 5:45	4/13/2019 15:20	9.6	0.25	0.03	0.12	28.1	4/13/2019 5:45	4/14/2019 3:20	21.7	0.30	0.47	23,226
4/16/2019 17:05	4/16/2019 19:20	2.3	0.10	0.04	0.12	78.3	4/16/2019 17:00	4/17/2019 7:15	14.3	0.08	0.10	4,053
4/18/2019 5:50	4/18/2019 7:20	1.5	0.10	0.07	0.24	35.2	4/18/2019 5:50	4/18/2019 18:40	12.9	0.08	0.10	3,825
4/18/2019 18:45	4/18/2019 19:50	1.1	0.07	0.06	0.12	12.1	4/18/2019 18:40	4/19/2019 4:05	9.5	0.10	0.12	3,459
4/19/2019 4:05	4/19/2019 16:00	11.9	0.13	0.01	0.12	8.8	4/19/2019 4:05	4/20/2019 3:55	23.9	0.15	0.23	12,732
4/22/2019 10:50	4/22/2019 17:45	6.9	0.26	0.04	0.12	68.8	4/22/2019 10:50	4/23/2019 5:45	19.0	0.38	0.63	26,151
5/14/2019 8:30	5/14/2019 12:30	4.0	0.05	0.01	0.12	519.6	5/14/2019 8:30	5/15/2019 0:30	16.1	0.03	0.03	1,734
5/15/2019 16:40	5/15/2019 19:30	2.8	0.06	0.02	0.12	31.7	5/15/2019 16:40	5/16/2019 7:30	14.9	0.03	0.03	1,539
5/16/2019 10:50	5/17/2019 6:25	19.6	0.83	0.04	0.24	17.1	5/16/2019 10:50	5/17/2019 18:20	31.6	0.42	0.80	48,033
5/20/2019 9:30	5/20/2019 22:40	13.2	0.31	0.02	0.12	77.2	5/20/2019 9:30	5/21/2019 10:40	25.3	0.16	0.33	14,442
5/24/2019 8:55	5/24/2019 10:20	1.4	0.03	0.02	0.12	83.7	5/24/2019 8:55	5/24/2019 22:15	13.4	0.03	0.04	1,566
5/25/2019 12:00	5/25/2019 16:25	4.4	0.16	0.04	0.12	110.8	5/25/2019 12:00	5/26/2019 4:25	16.5	0.11	0.19	6,612

Table D-14. Summary Statistics for Individual Storm Events at the TYLMI Station.

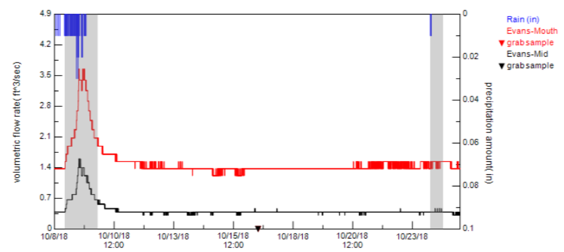
Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
6/6/2019 14:20	6/6/2019 18:10	3.8	0.08	0.02	0.36	286.8	6/6/2019 14:15	6/7/2019 6:10	16.0	0.03	0.03	1,587
6/7/2019 8:35	6/7/2019 12:30	3.9	0.03	0.01	0.12	15.7	6/7/2019 8:35	6/8/2019 0:30	16.0	0.02	0.03	1,287
6/19/2019 18:35	6/20/2019 2:55	8.3	0.70	0.08	0.72	313.7	6/19/2019 18:30	6/20/2019 14:55	20.5	0.22	0.40	16,566
6/23/2019 6:35	6/23/2019 8:30	1.9	0.04	0.02	0.12	77.1	6/23/2019 6:30	6/23/2019 20:25	14.0	0.02	0.02	1,008
6/23/2019 23:15	6/24/2019 2:45	3.5	0.04	0.01	0.12	16.7	6/23/2019 23:10	6/24/2019 14:45	15.7	0.02	0.02	1,128
6/27/2019 2:20	6/27/2019 6:55	4.6	0.04	0.01	0.12	75.1	6/27/2019 2:15	6/27/2019 18:55	16.8	0.02	0.03	1,464
7/2/2019 12:55	7/2/2019 21:15	8.3	0.13	0.02	0.12	130.6	7/2/2019 12:55	7/3/2019 4:15	15.4	0.03	0.04	1,890
7/3/2019 4:15	7/3/2019 9:50	5.6	0.13	0.02	0.12	9.1	7/3/2019 4:15	7/3/2019 21:45	17.6	0.08	0.12	4,770
7/9/2019 21:05	7/10/2019 15:00	17.9	0.25	0.01	0.12	157.4	7/9/2019 21:00	7/11/2019 6:30	33.6	0.07	0.12	8,514
7/16/2019 1:45	7/16/2019 7:10	5.4	0.52	0.10	1.20	132.0	7/16/2019 1:40	7/16/2019 19:05	17.5	0.35	0.47	21,960
7/17/2019 5:30	7/17/2019 7:55	2.4	0.09	0.04	0.12	26.2	7/17/2019 5:30	7/17/2019 19:50	14.4	0.09	0.12	4,875
7/17/2019 21:40	7/18/2019 7:30	9.8	0.28	0.03	0.48	15.0	7/17/2019 21:40	7/18/2019 19:10	21.6	0.25	0.40	19,422
7/18/2019 19:10	7/19/2019 4:35	9.4	0.25	0.03	0.12	17.1	7/18/2019 19:10	7/19/2019 16:30	21.4	0.22	0.33	17,298
8/2/2019 2:55	8/2/2019 4:40	1.8	0.33	0.19	0.96	340.0	8/2/2019 2:55	8/2/2019 16:40	13.8	0.15	0.19	7,686
8/10/2019 3:35	8/10/2019 8:25	4.8	0.71	0.15	0.72	191.7	8/10/2019 3:30	8/10/2019 20:25	17.0	0.35	0.47	21,597
8/11/2019 6:50	8/11/2019 11:55	5.1	0.05	0.01	0.12	22.8	8/11/2019 6:45	8/11/2019 23:55	17.3	0.13	0.23	7,968
8/21/2019 5:20	8/21/2019 8:30	3.2	0.09	0.03	0.24	238.2	8/21/2019 5:15	8/21/2019 17:35	12.4	0.04	0.04	1,563
8/21/2019 17:40	8/21/2019 21:55	4.3	0.06	0.01	0.12	10.1	8/21/2019 17:35	8/22/2019 9:55	16.4	0.05	0.06	3,198
8/29/2019 18:05	8/29/2019 23:30	5.4	0.18	0.03	0.36	189.9	8/29/2019 18:00	8/30/2019 11:25	17.5	0.05	0.06	3,303
9/7/2019 19:30	9/7/2019 21:35	2.1	0.72	0.35	0.96	215.8	9/7/2019 19:30	9/8/2019 5:30	10.1	0.40	0.63	14,625
9/8/2019 5:30	9/8/2019 9:25	3.9	0.09	0.02	0.12	8.3	9/8/2019 5:30	9/8/2019 14:55	9.5	0.37	0.40	12,510
9/8/2019 14:55	9/8/2019 21:00	6.1	0.48	0.08	2.64	8.2	9/8/2019 14:55	9/9/2019 1:50	11.0	0.42	0.74	16,482
9/9/2019 1:50	9/9/2019 21:45	19.9	2.20	0.11	2.40	10.7	9/9/2019 1:50	9/10/2019 9:40	31.9	0.82	2.33	94,146
9/12/2019 19:50	9/12/2019 22:10	2.3	0.21	0.09	0.48	73.9	9/12/2019 19:50	9/13/2019 10:05	14.3	0.07	0.10	3,537
9/14/2019 20:20	9/15/2019 14:20	18.0	0.68	0.04	0.24	46.4	9/14/2019 20:15	9/16/2019 2:15	30.1	0.17	0.28	18,405
9/16/2019 17:30	9/16/2019 19:20	1.8	0.04	0.02	0.36	30.7	9/16/2019 17:25	9/17/2019 7:05	13.8	0.02	0.04	990
9/17/2019 7:05	9/18/2019 10:50	27.8	0.63	0.02	0.72	13.6	9/17/2019 7:05	9/18/2019 22:50	39.8	0.15	0.23	20,898
9/22/2019 5:35	9/23/2019 0:05	18.5	0.54	0.03	0.24	90.9	9/22/2019 5:35	9/23/2019 11:00	29.5	0.10	0.19	10,500
9/23/2019 11:00	9/23/2019 14:30	3.5	0.10	0.03	0.12	11.8	9/23/2019 11:00	9/24/2019 1:15	14.3	0.09	0.12	4,422
9/24/2019 1:15	9/24/2019 9:40	8.4	0.10	0.01	0.12	11.6	9/24/2019 1:15	9/24/2019 21:40	20.5	0.03	0.07	2,499
9/26/2019 4:50	9/26/2019 8:25	3.6	0.17	0.05	0.12	44.8	9/26/2019 4:50	9/26/2019 20:25	15.7	0.03	0.06	1,860
9/27/2019 1:00	9/27/2019 4:10	3.2	0.09	0.03	0.12	17.8	9/27/2019 0:55	9/27/2019 10:25	9.6	0.03	0.04	972
9/27/2019 10:25	9/28/2019 0:00	13.6	0.23	0.02	0.72	7.2	9/27/2019 10:25	9/28/2019 11:55	25.6	0.04	0.06	3,969
9/29/2019 1:20	9/29/2019 3:55	2.6	0.08	0.03	0.24	30.9	9/29/2019 1:15	9/29/2019 15:55	14.8	0.01	0.02	576

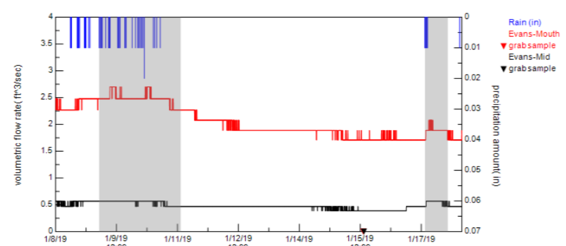
APPENDIX E

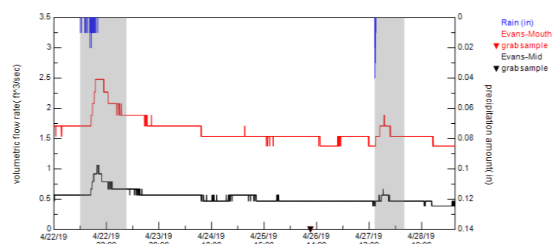
Line Plots Showing Sampling Times Relative to the Storm Event Hydrograph

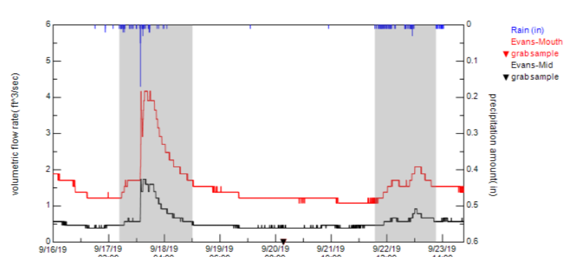
Evans – Application Watershed – Sampled Hydrographs

Base Flow



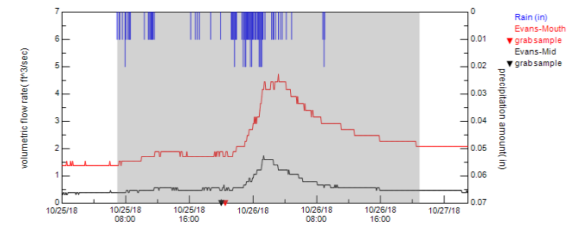




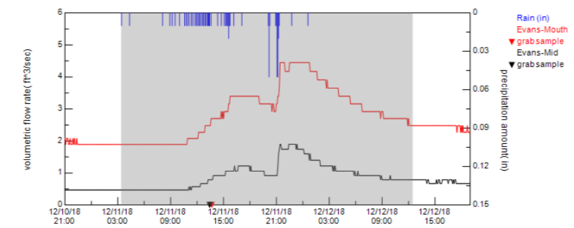


Storm Flow

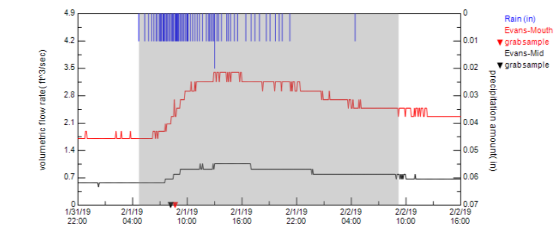
Evans Creek 10/25/2018



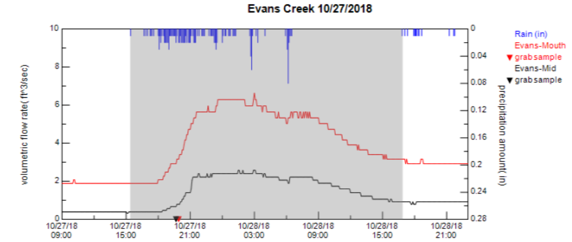
Evans Creek 12/11/2018



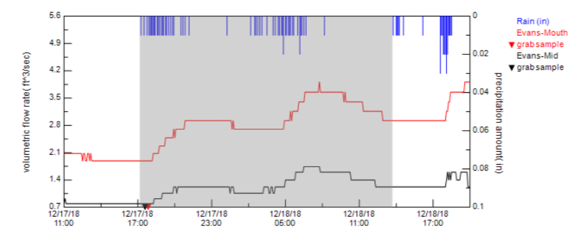
Evans Creek 2/1/2019



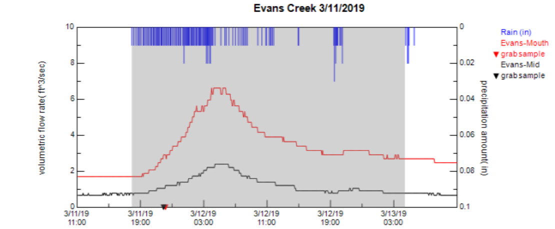
Evans Creek 10/27/2018



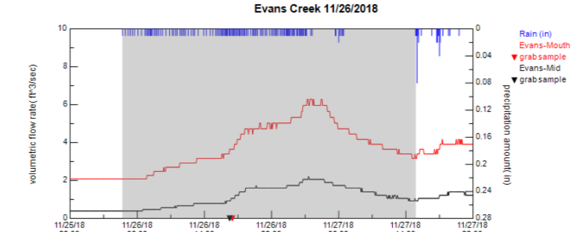
Evans Creek 12/17/2018



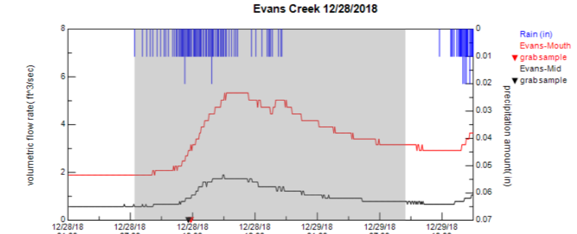
Evans Creek 3/11/2019



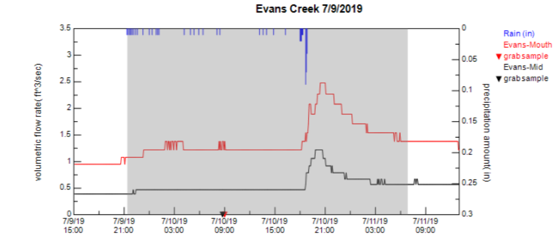
Evans Creek 11/26/2018



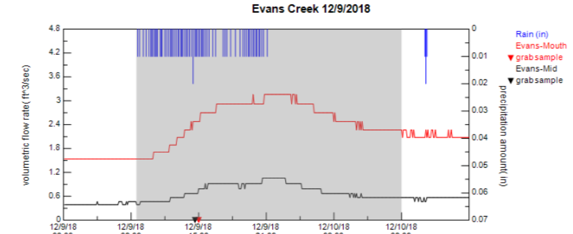
Evans Creek 12/28/2018



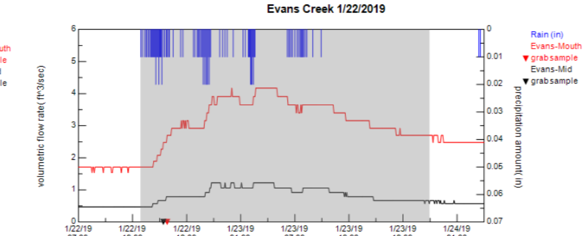
Evans Creek 7/9/2019



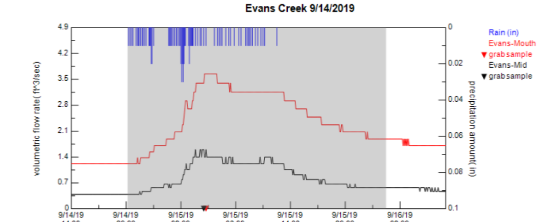
Evans Creek 12/9/2018



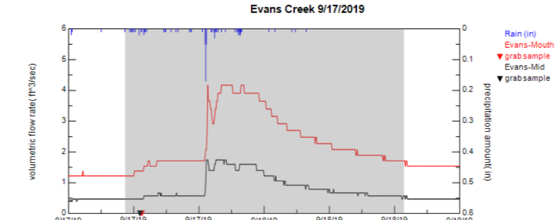
Evans Creek 1/22/2019



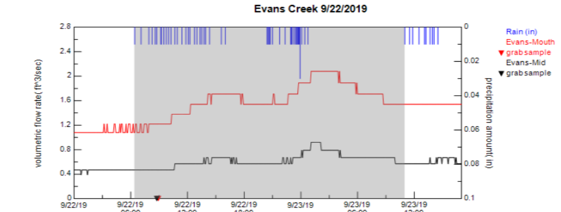
Evans Creek 9/14/2019



Evans Creek 9/17/2019

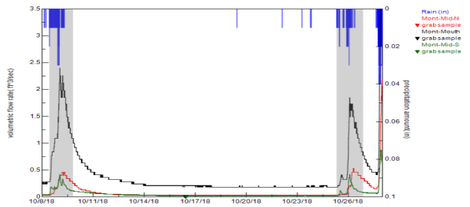


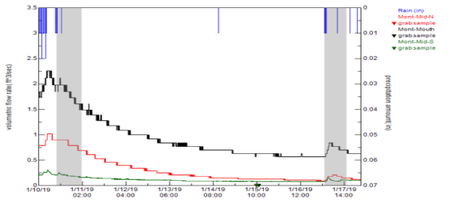
Evans Creek 9/22/2019

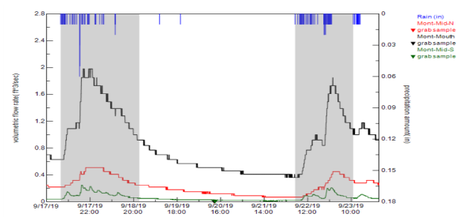


Monticello – Application Watershed – Sampled Hydrographs

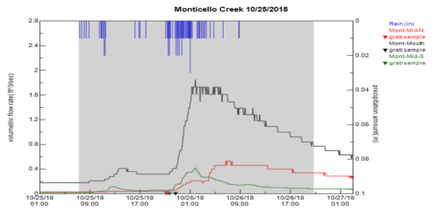
Base Flow

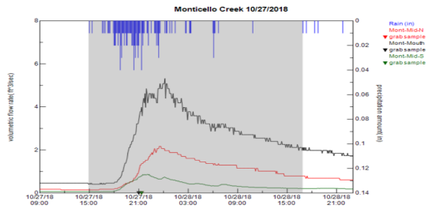


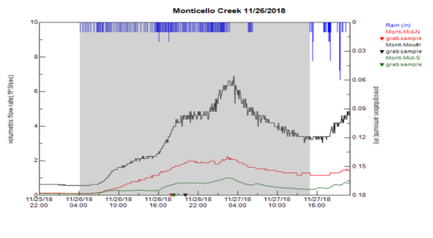


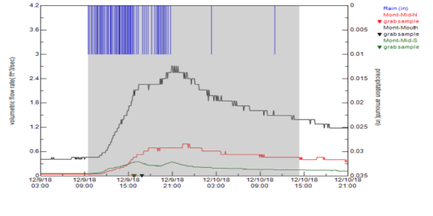


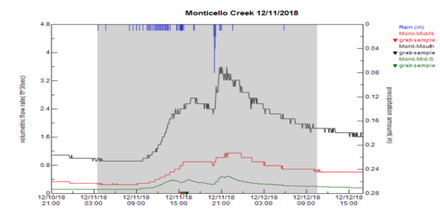
Storm Flow

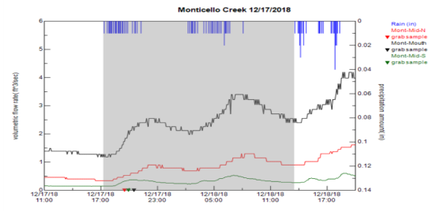


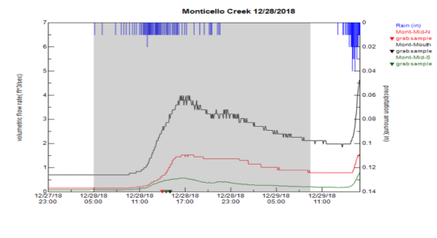


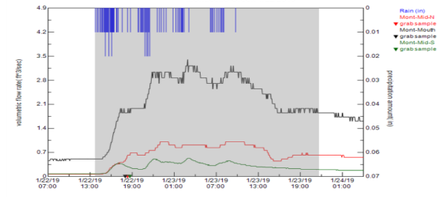


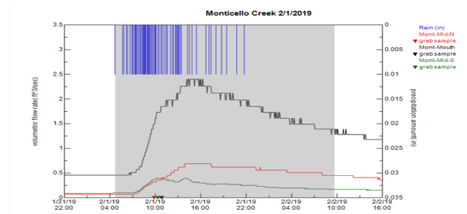


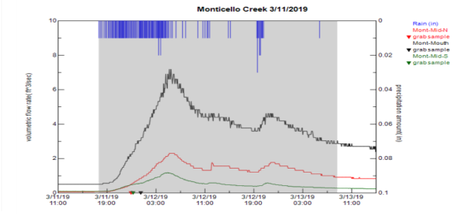


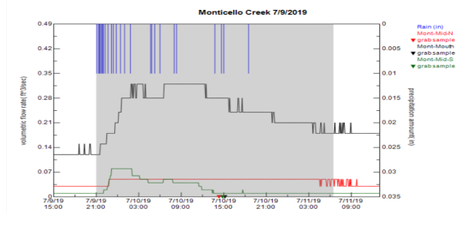


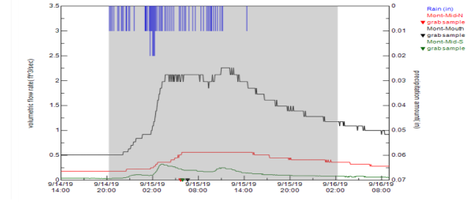


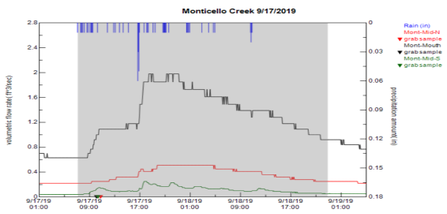


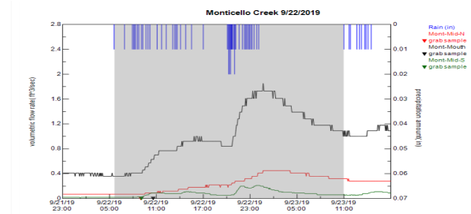






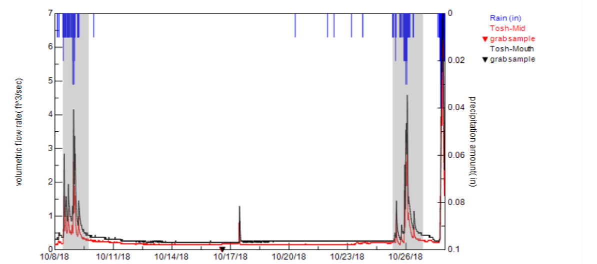


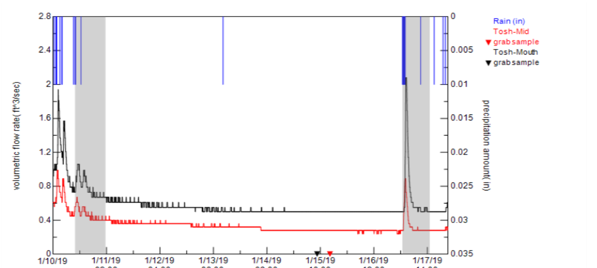


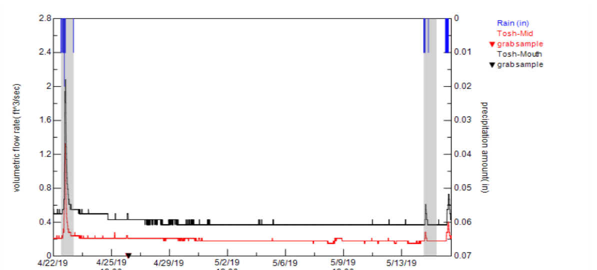


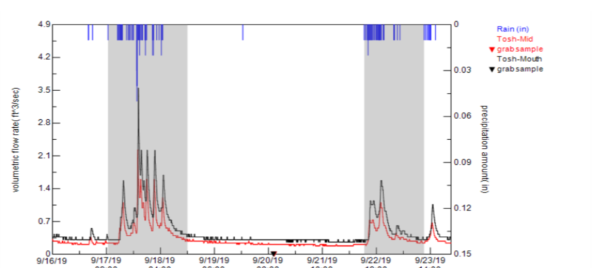
Tosh – Application Watershed – Sampled Hydrographs

Base Flow

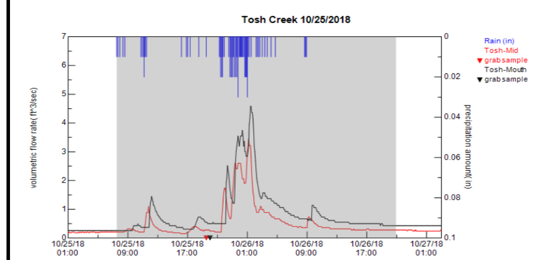


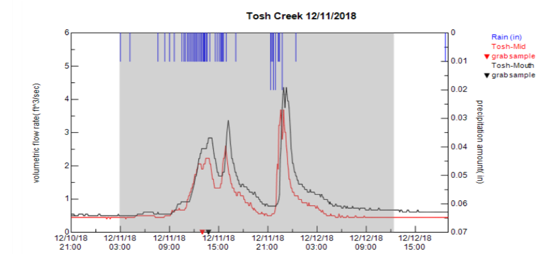


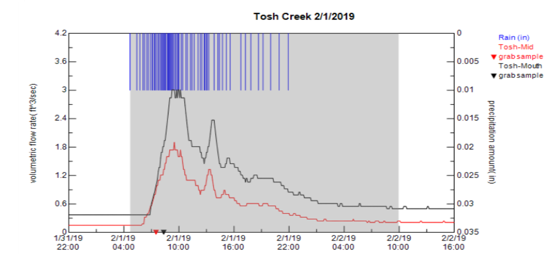


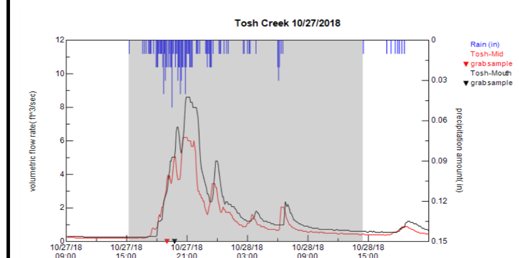


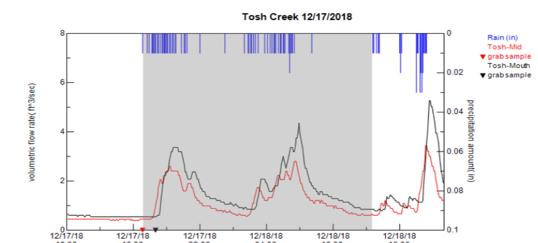
Storm Flow

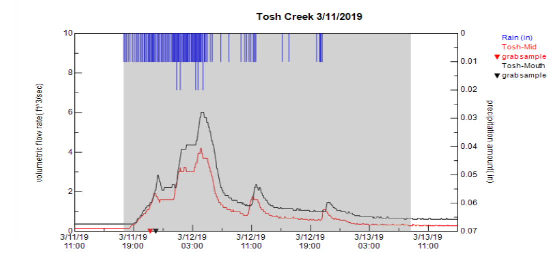


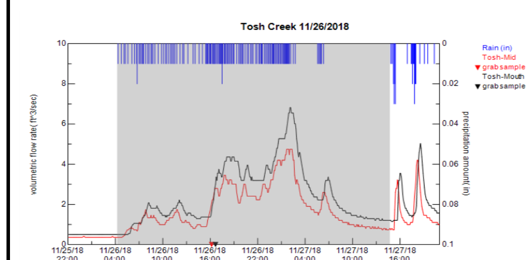


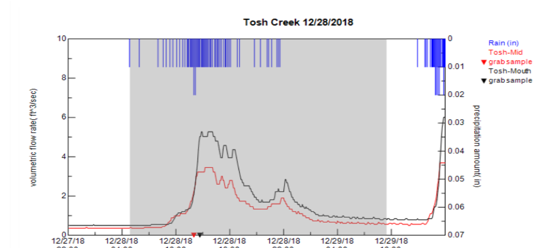


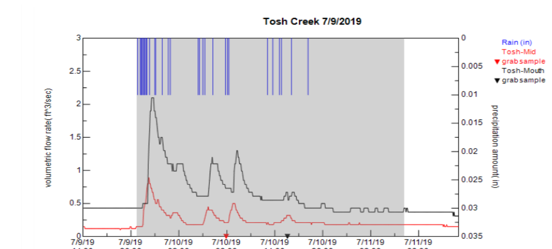


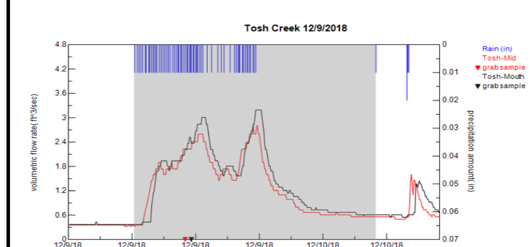


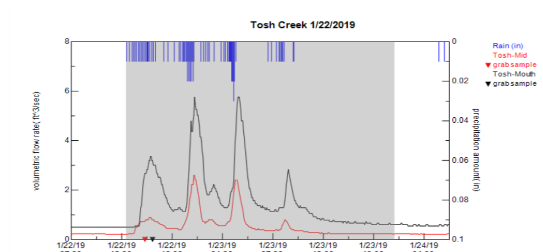


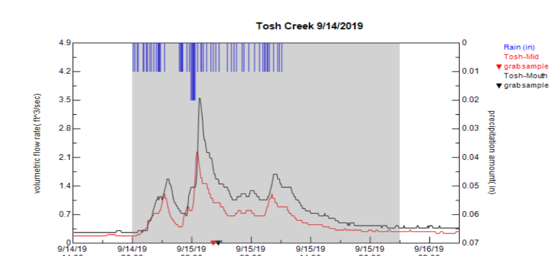


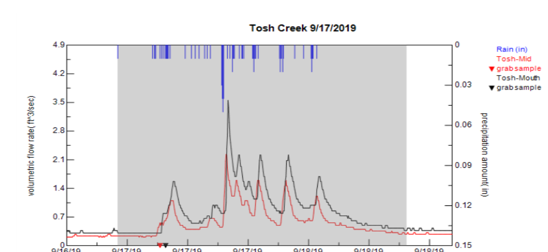


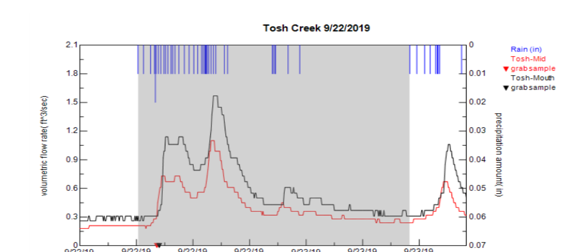






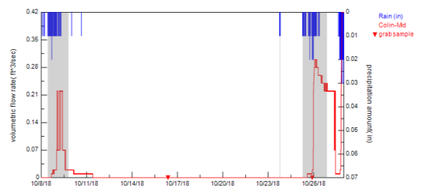


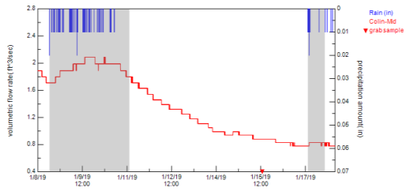


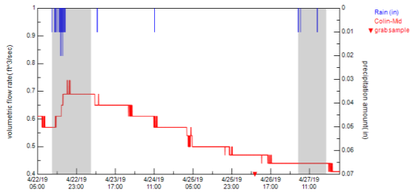


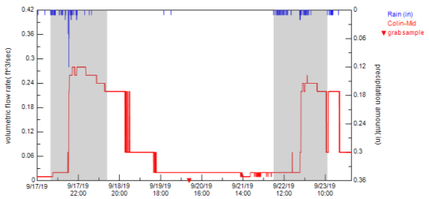
Colin – Reference Watershed – Sampled Hydrographs

Base Flow

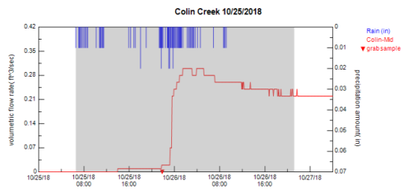


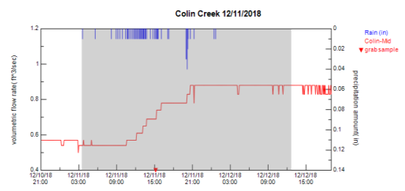


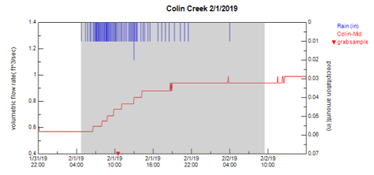


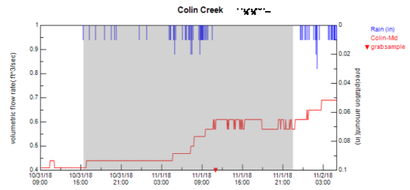


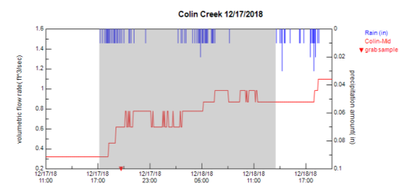
Storm Flow

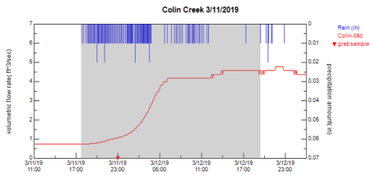


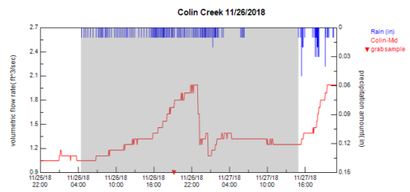


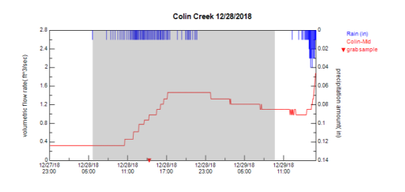


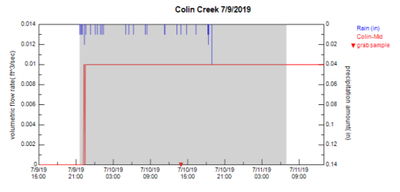


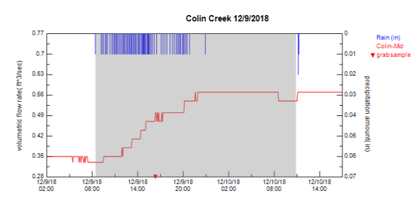


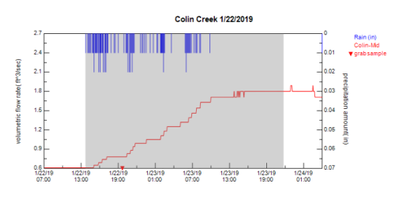


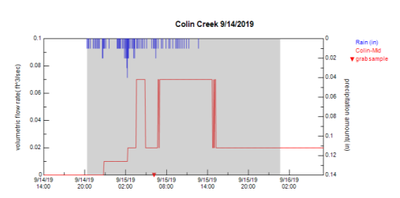


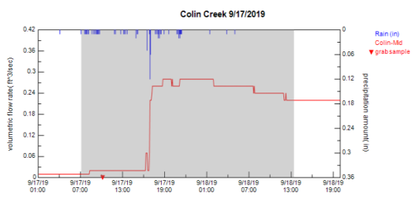


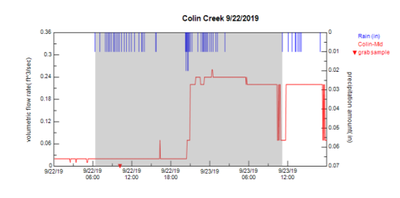






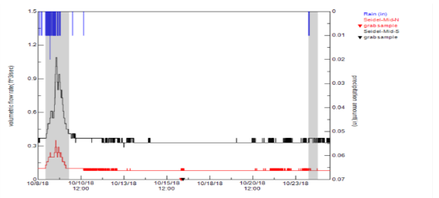


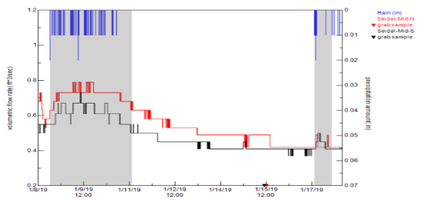


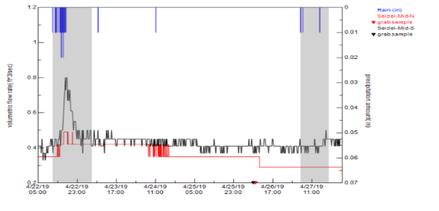


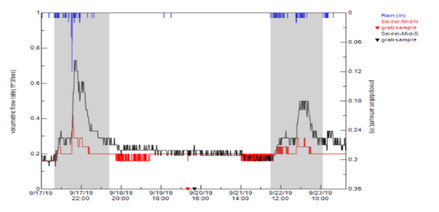
Seidel – Reference Watershed – Sampled Hydrographs

Base Flow

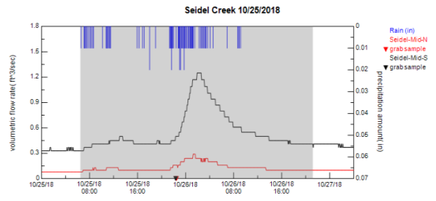


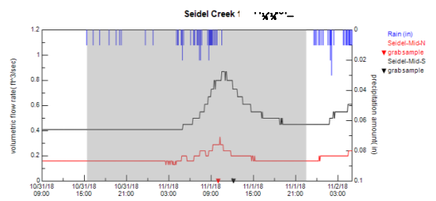


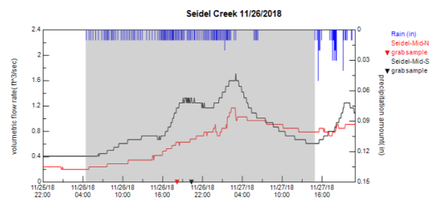


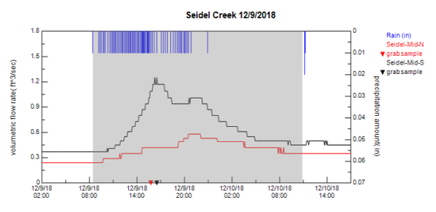


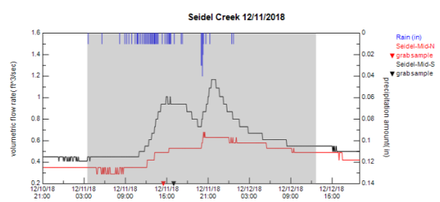
Storm Flow

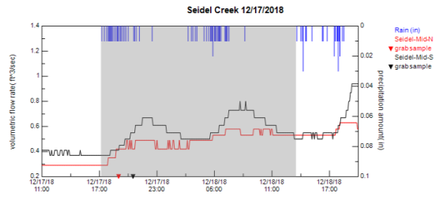


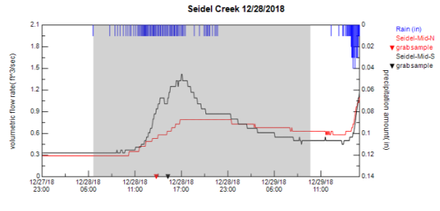


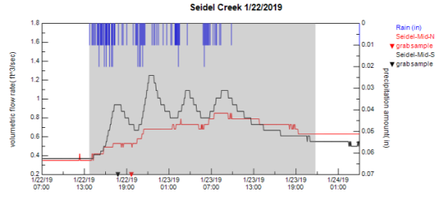


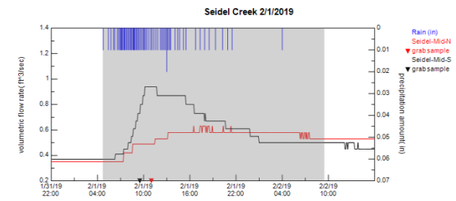


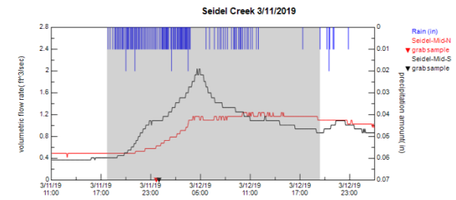


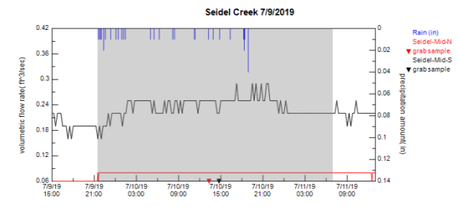


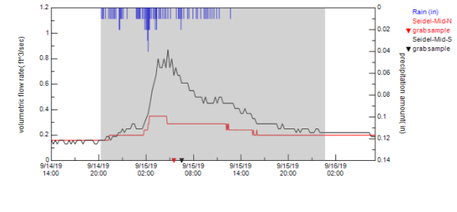


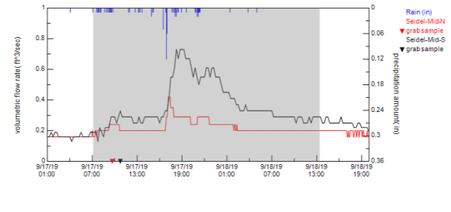


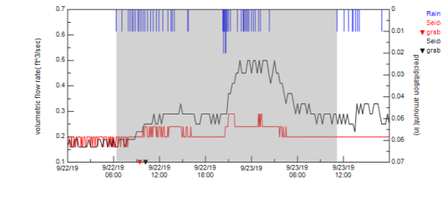






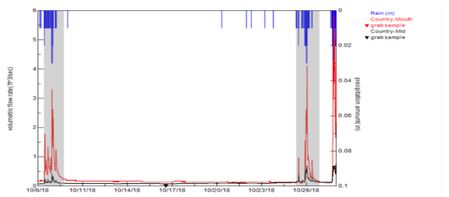


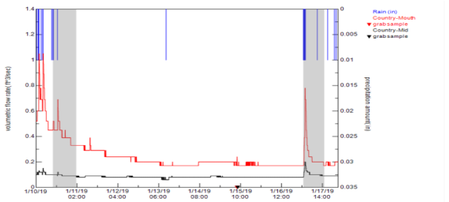


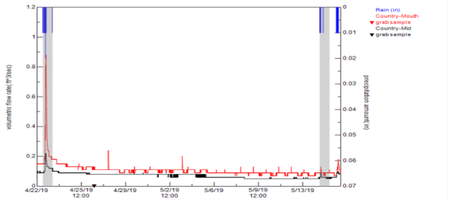


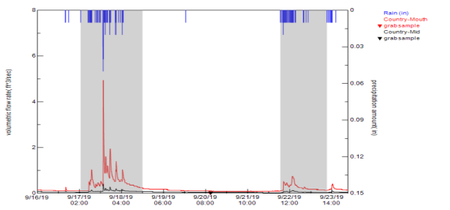
Country – Control Watershed – Sampled Hydrographs

Base Flow

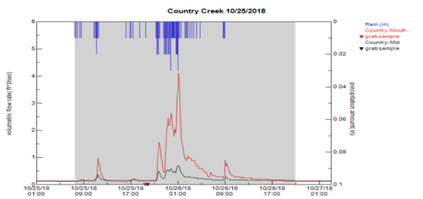


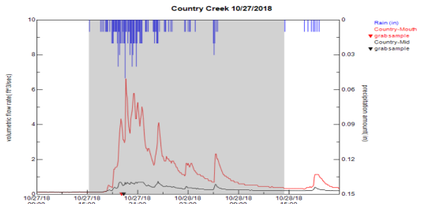


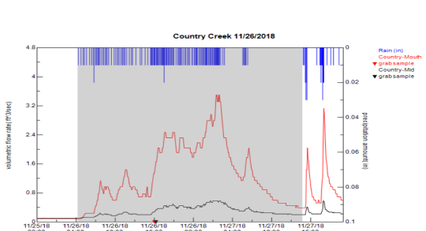


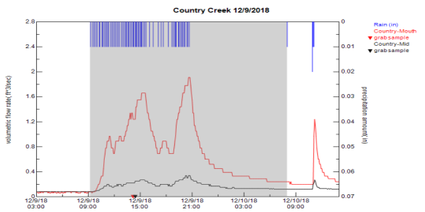


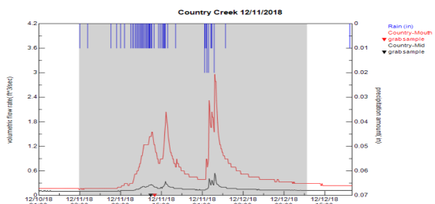
Storm Flow

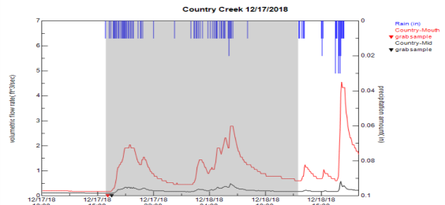


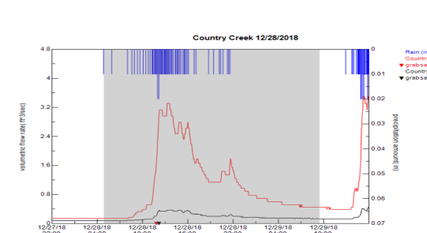


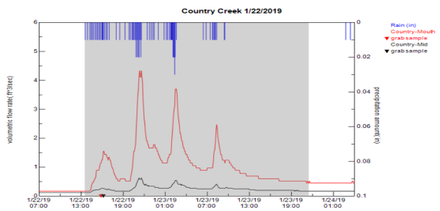


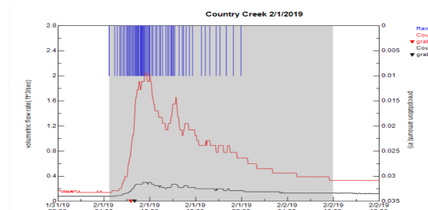


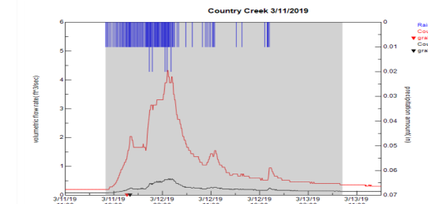


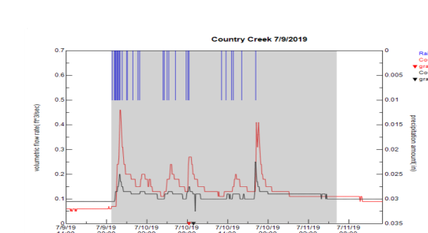


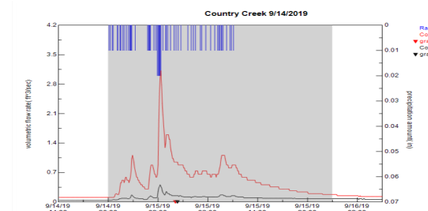


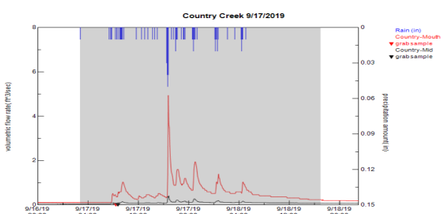


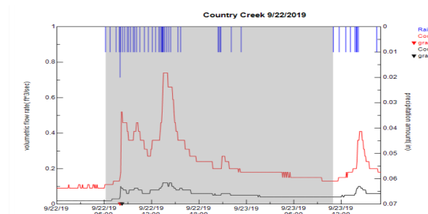






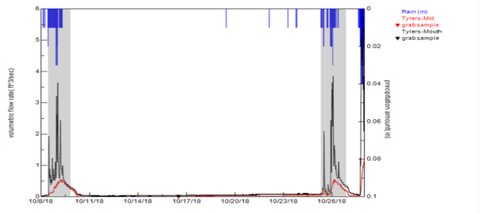


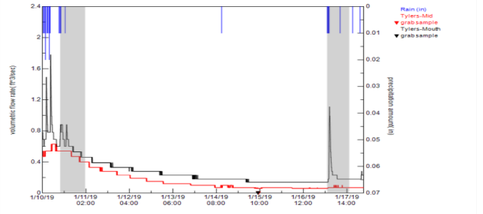


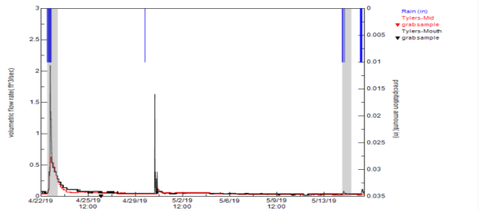


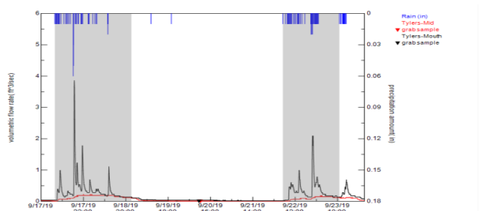
Tyler's – Control Watershed – Sampled Hydrographs

Base Flow

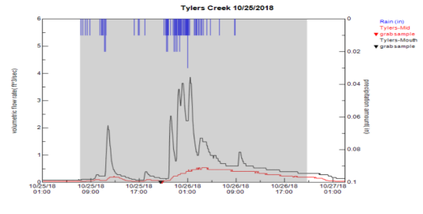


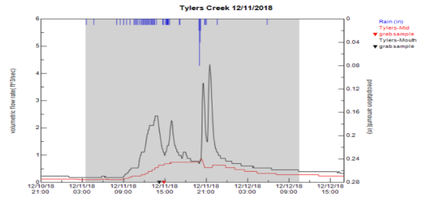


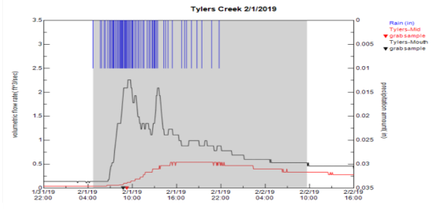


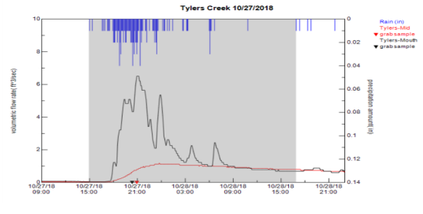


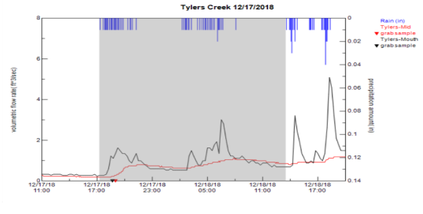
Storm Flow

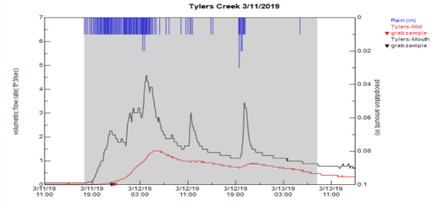


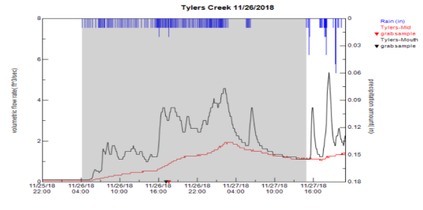


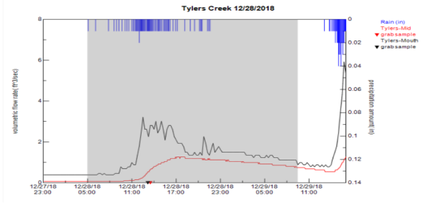


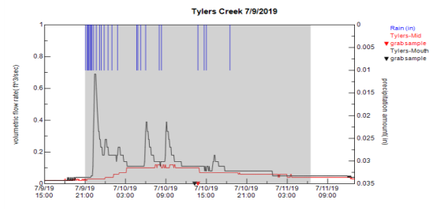


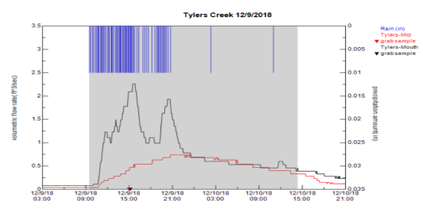


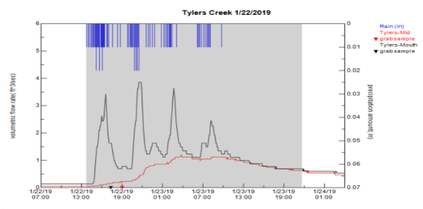


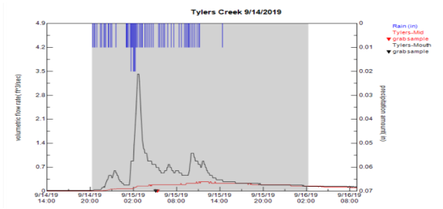


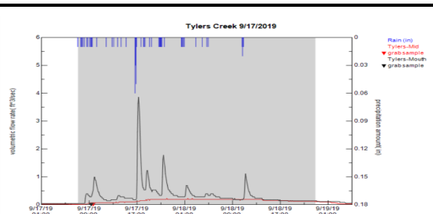


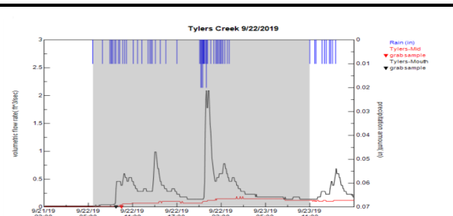












APPENDIX F

Laboratory Reports, Field Forms, and Data Quality Assurance Audit Forms for Water Quality Monitoring

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 2, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1810-212

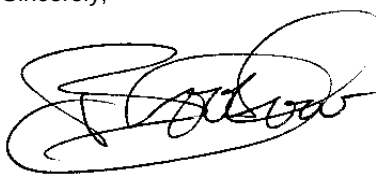
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on October 16, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

Case Narrative

Samples were collected on October 16, 2018 and received by the laboratory on October 16, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181016**					
Laboratory ID:	10-212-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**COUMI-20181016**					
Laboratory ID:	10-212-02					
Total Suspended Solids	**24**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**COUMO-20181016**					
Laboratory ID:	10-212-03					
Total Suspended Solids	**2.6**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**EVAMS-20181016**					
Laboratory ID:	10-212-04					
Total Suspended Solids	**4.4**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**EVALSS-20181016**					
Laboratory ID:	10-212-05					
Total Suspended Solids	**6.8**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**MONMN-20181016**					
Laboratory ID:	10-212-06					
Total Suspended Solids	**32**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**MONMS-20181016**					
Laboratory ID:	10-212-07					
Total Suspended Solids	**10**	1.0	SM 2540D	10-18-18	10-19-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181016**					
Laboratory ID:	10-212-08					
Total Suspended Solids	**2.2**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**SEIMN-20181016**					
Laboratory ID:	10-212-09					
Total Suspended Solids	**5.0**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**SEIMS-20181016**					
Laboratory ID:	10-212-10					
Total Suspended Solids	**32**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**TOSMI-20181016**					
Laboratory ID:	10-212-11					
Total Suspended Solids	**1.2**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**TOSMO-20181016**					
Laboratory ID:	10-212-12					
Total Suspended Solids	**2.0**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**TYLMI-20181016**					
Laboratory ID:	10-212-13					
Total Suspended Solids	**6.0**	1.0	SM 2540D	10-18-18	10-19-18	
Client ID:	**TYLMO-20181016**					
Laboratory ID:	10-212-14					
Total Suspended Solids	**5.4**	1.0	SM 2540D	10-18-18	10-19-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA53-20181016**					
Laboratory ID:	10-212-15					
Total Suspended Solids	**2.2**	1.0	SM 2540D	10-18-18	10-19-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1018W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-18-18	10-19-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-212-14								
	ORIG	DUP							
Total Suspended Solids	**5.40**	**6.00**	NA	NA	NA	NA	11	22	
SPIKE BLANK									
Laboratory ID:	SB1018W1								
	SB		SB		SB				
Total Suspended Solids	**105**		100	NA	105	76-114	NA	NA	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181016**					
Laboratory ID:	10-212-01					
Turbidity	**0.45**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**COUMI-20181016**					
Laboratory ID:	10-212-02					
Turbidity	**6.6**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**COUMO-20181016**					
Laboratory ID:	10-212-03					
Turbidity	**0.74**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**EVAMS-20181016**					
Laboratory ID:	10-212-04					
Turbidity	**2.9**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**EVALSS-20181016**					
Laboratory ID:	10-212-05					
Turbidity	**3.7**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**MONMN-20181016**					
Laboratory ID:	10-212-06					
Turbidity	**11**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**MONMS-20181016**					
Laboratory ID:	10-212-07					
Turbidity	**3.5**	0.10	EPA 180.1	10-17-18	10-17-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181016**					
Laboratory ID:	10-212-08					
Turbidity	**1.5**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**SEIMN-20181016**					
Laboratory ID:	10-212-09					
Turbidity	**2.5**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**SEIMS-20181016**					
Laboratory ID:	10-212-10					
Turbidity	**11**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**TOSMI-20181016**					
Laboratory ID:	10-212-11					
Turbidity	**0.95**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**TOSMO-20181016**					
Laboratory ID:	10-212-12					
Turbidity	**1.4**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**TYLMI-20181016**					
Laboratory ID:	10-212-13					
Turbidity	**3.0**	0.10	EPA 180.1	10-17-18	10-17-18	
Client ID:	**TYLMO-20181016**					
Laboratory ID:	10-212-14					
Turbidity	**2.9**	0.10	EPA 180.1	10-17-18	10-17-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA53-20181016**					
Laboratory ID:	10-212-15					
Turbidity	**0.67**	0.10	EPA 180.1	10-17-18	10-17-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1017W1					
Turbidity	**ND**	0.10	EPA 180.1	10-17-18	10-17-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-212-01								
	ORIG	DUP							
Turbidity	**0.450**	**0.350**	NA	NA	NA	NA	25	15	C

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181016**					
Laboratory ID:	10-212-01					
Hardness	**14**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**COUMI-20181016**					
Laboratory ID:	10-212-02					
Hardness	**170**	5.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**COUMO-20181016**					
Laboratory ID:	10-212-03					
Hardness	**120**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**EVAMS-20181016**					
Laboratory ID:	10-212-04					
Hardness	**110**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**EVALSS-20181016**					
Laboratory ID:	10-212-05					
Hardness	**99**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**MONMN-20181016**					
Laboratory ID:	10-212-06					
Hardness	**110**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**MONMS-20181016**					
Laboratory ID:	10-212-07					
Hardness	**180**	5.0	200.7/SM 2340B	10-22-18	10-23-18	

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Laboratory Reference: 1810-212
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181016**					
Laboratory ID:	10-212-08					
Hardness	**120**	5.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**SEIMN-20181016**					
Laboratory ID:	10-212-09					
Hardness	**53**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**SEIMS-20181016**					
Laboratory ID:	10-212-10					
Hardness	**57**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**TOSMI-20181016**					
Laboratory ID:	10-212-11					
Hardness	**160**	5.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**TOSMO-20181016**					
Laboratory ID:	10-212-12					
Hardness	**130**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**TYLMI-20181016**					
Laboratory ID:	10-212-13					
Hardness	**120**	1.0	200.7/SM 2340B	10-22-18	10-23-18	
Client ID:	**TYLMO-20181016**					
Laboratory ID:	10-212-14					
Hardness	**98**	1.0	200.7/SM 2340B	10-22-18	10-23-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA53-20181016**					
Laboratory ID:	10-212-15					
Hardness	**16**	1.0	200.7/SM 2340B	10-22-18	10-23-18	

Date of Report: November 2, 2018
Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1022WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	10-22-18	10-23-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-212-07										
	ORIG	DUP									
Hardness	**179**	**182**	NA		NA	NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	10-212-07										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**330**	**322**	132	132	179	114	108	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB1022WH1										
	SB		SB			SB					
Hardness	**141**		132		NA	107		80-120	NA	NA	

Date of Report: November 2, 2018
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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181016**					
Laboratory ID:	10-212-01					
Dissolved Organic Carbon	**7.2**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**COUMI-20181016**					
Laboratory ID:	10-212-02					
Dissolved Organic Carbon	**2.9**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**COUMO-20181016**					
Laboratory ID:	10-212-03					
Dissolved Organic Carbon	**2.8**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**EVAMS-20181016**					
Laboratory ID:	10-212-04					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**EVALSS-20181016**					
Laboratory ID:	10-212-05					
Dissolved Organic Carbon	**2.8**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**MONMN-20181016**					
Laboratory ID:	10-212-06					
Dissolved Organic Carbon	**3.6**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**MONMS-20181016**					
Laboratory ID:	10-212-07					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	10-22-18	10-22-18	

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Samples Submitted: October 16, 2018
Laboratory Reference: 1810-212
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181016**					
Laboratory ID:	10-212-08					
Dissolved Organic Carbon	**3.2**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**SEIMN-20181016**					
Laboratory ID:	10-212-09					
Dissolved Organic Carbon	**1.4**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**SEIMS-20181016**					
Laboratory ID:	10-212-10					
Dissolved Organic Carbon	**3.7**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**TOSMI-20181016**					
Laboratory ID:	10-212-11					
Dissolved Organic Carbon	**1.9**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**TOSMO-20181016**					
Laboratory ID:	10-212-12					
Dissolved Organic Carbon	**1.8**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**TYLMI-20181016**					
Laboratory ID:	10-212-13					
Dissolved Organic Carbon	**1.8**	1.0	SM 5310B	10-22-18	10-22-18	
Client ID:	**TYLMO-20181016**					
Laboratory ID:	10-212-14					
Dissolved Organic Carbon	**3.3**	1.0	SM 5310B	10-22-18	10-22-18	

Date of Report: November 2, 2018
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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA53-20181016**					
Laboratory ID:	10-212-15					
Dissolved Organic Carbon	**7.2**	1.0	SM 5310B	10-22-18	10-22-18	

Date of Report: November 2, 2018
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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1022W1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	10-22-18	10-22-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-212-01								
	ORIG	DUP							
Dissolved Organic Carbon	**7.21**	**7.25**	NA	NA	NA	NA	1	15	
MATRIX SPIKE									
Laboratory ID:	10-212-01								
	MS		MS		MS				
Dissolved Organic Carbon	**19.1**		10.0	7.21	119	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1022W1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.4**		10.0	NA	114	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181016**					
Laboratory ID:	10-212-01					
Total Phosphorus	**0.011**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**COUMI-20181016**					
Laboratory ID:	10-212-02					
Total Phosphorus	**0.16**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**COUMO-20181016**					
Laboratory ID:	10-212-03					
Total Phosphorus	**0.12**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**EVAMS-20181016**					
Laboratory ID:	10-212-04					
Total Phosphorus	**0.019**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**EVALSS-20181016**					
Laboratory ID:	10-212-05					
Total Phosphorus	**0.030**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**MONMN-20181016**					
Laboratory ID:	10-212-06					
Total Phosphorus	**0.14**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**MONMS-20181016**					
Laboratory ID:	10-212-07					
Total Phosphorus	**0.055**	0.010	EPA 365.1	10-19-18	10-22-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181016**					
Laboratory ID:	10-212-08					
Total Phosphorus	**0.042**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**SEIMN-20181016**					
Laboratory ID:	10-212-09					
Total Phosphorus	**0.039**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**SEIMS-20181016**					
Laboratory ID:	10-212-10					
Total Phosphorus	**0.090**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**TOSMI-20181016**					
Laboratory ID:	10-212-11					
Total Phosphorus	**0.060**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**TOSMO-20181016**					
Laboratory ID:	10-212-12					
Total Phosphorus	**0.062**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**TYLMI-20181016**					
Laboratory ID:	10-212-13					
Total Phosphorus	**0.037**	0.010	EPA 365.1	10-19-18	10-22-18	
Client ID:	**TYLMO-20181016**					
Laboratory ID:	10-212-14					
Total Phosphorus	**0.052**	0.010	EPA 365.1	10-19-18	10-22-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA53-20181016**					
Laboratory ID:	10-212-15					
Total Phosphorus	**0.011**	0.010	EPA 365.1	10-19-18	10-22-18	

Date of Report: November 2, 2018
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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1019W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	10-19-18	10-22-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-212-01								
	ORIG	DUP							
Total Phosphorus	**0.0111**	**0.0107**	NA	NA	NA	NA	4	12	
MATRIX SPIKE									
Laboratory ID:	10-212-01								
	MS		MS		MS				
Total Phosphorus	**0.252**		0.250	0.0111	96	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1019W1								
	SB		SB		SB				
Total Phosphorus	**0.243**		0.250	NA	97	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181016**					
Laboratory ID:	10-212-01					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**COUMI-20181016**					
Laboratory ID:	10-212-02					
Copper	**1.9**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**14**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**COUMO-20181016**					
Laboratory ID:	10-212-03					
Copper	**1.4**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**14**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**EVAMS-20181016**					
Laboratory ID:	10-212-04					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**EVALSS-20181016**					
Laboratory ID:	10-212-05					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**MONMN-20181016**					
Laboratory ID:	10-212-06					
Copper	**2.2**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**22**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**MONMS-20181016**					
Laboratory ID:	10-212-07					
Copper	**1.0**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181016**					
Laboratory ID:	10-212-08					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**7.3**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**SEIMN-20181016**					
Laboratory ID:	10-212-09					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**SEIMS-20181016**					
Laboratory ID:	10-212-10					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**TOSMI-20181016**					
Laboratory ID:	10-212-11					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**9.2**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**TOSMO-20181016**					
Laboratory ID:	10-212-12					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**TYLMI-20181016**					
Laboratory ID:	10-212-13					
Copper	**3.5**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**15**	5.0	EPA 200.8	10-22-18	10-23-18	
Client ID:	**TYLMO-20181016**					
Laboratory ID:	10-212-14					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA53-20181016**					
Laboratory ID:	10-212-15					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1022WH1					
Copper	**ND**	1.0	EPA 200.8	10-22-18	10-23-18	
Zinc	**ND**	5.0	EPA 200.8	10-22-18	10-23-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-212-03										
	ORIG	DUP									
Copper	**1.42**	**1.40**	NA	NA		NA		NA	1	20	
Zinc	**13.6**	**12.4**	NA	NA		NA		NA	9	20	
MATRIX SPIKES											
Laboratory ID:	10-212-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**99.0**	**100**	100	100	1.42	**98**	**99**	75-125	1	20	
Zinc	**115**	**121**	100	100	13.6	**102**	**108**	75-125	5	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181016**					
Laboratory ID:	10-212-01					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**COUMI-20181016**					
Laboratory ID:	10-212-02					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**COUMO-20181016**					
Laboratory ID:	10-212-03					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**EVAMS-20181016**					
Laboratory ID:	10-212-04					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**EVALSS-20181016**					
Laboratory ID:	10-212-05					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**MONMN-20181016**					
Laboratory ID:	10-212-06					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**MONMS-20181016**					
Laboratory ID:	10-212-07					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181016**					
Laboratory ID:	10-212-08					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**SEIMN-20181016**					
Laboratory ID:	10-212-09					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**SEIMS-20181016**					
Laboratory ID:	10-212-10					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**TOSMI-20181016**					
Laboratory ID:	10-212-11					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**9.4**	5.0	EPA 200.8		10-23-18	
Client ID:	**TOSMO-20181016**					
Laboratory ID:	10-212-12					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**TYLMI-20181016**					
Laboratory ID:	10-212-13					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	
Client ID:	**TYLMO-20181016**					
Laboratory ID:	10-212-14					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA53-20181016**					
Laboratory ID:	10-212-15					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	

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DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1023D1					
Copper	**ND**	1.0	EPA 200.8		10-23-18	
Zinc	**ND**	5.0	EPA 200.8		10-23-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-212-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-212-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**74.0**	**74.4**	80.0	80.0	ND	**93**	**93**	75-125	1	20	
Zinc	**79.6**	**78.0**	80.0	80.0	ND	**100**	**98**	75-125	2	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 2 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181016	Water	18-A018955	Micro, NUT
COUMI-20181016	Water	18-A018956	Micro, NUT
COUMO-20181016	Water	18-A018957	Micro, NUT
EVAMS-20181016	Water	18-A018958	Micro, NUT
EVALSS-20181016	Water	18-A018959	Micro, NUT
MONMN-20181016	Water	18-A018960	Micro, NUT
MONMS-20181016	Water	18-A018961	Micro, NUT
MONM-20181016	Water	18-A018962	Micro, NUT
SEIMN-20181016	Water	18-A018963	Micro, NUT
SEIMS-20181016	Water	18-A018964	Micro, NUT
TOSMI-20181016	Water	18-A018965	Micro, NUT
TOSMO-20181016	Water	18-A018966	Micro, NUT
TYLMI-20181016	Water	18-A018967	Micro, NUT
TYLMO-20181016	Water	18-A018968	Micro, NUT
QA53-20181016	Water	18-A018969	Micro, NUT

Your samples were received on Tuesday, October 16, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 2 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 10-212

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 10-212
All results reported on an as received basis.

Date Received: 10/16/18
Date Reported: 11/ 2/18

AMTEST Identification Number **18-A018955**
Client Identification **COLM-20181016**
Sampling Date **10/16/18, 10:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.20	mg/l		0.1			
Total Nitrogen (TKN)	0.140	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.060	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018956**
Client Identification **COUMI-20181016**
Sampling Date **10/16/18, 14:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	13.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.158	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.34	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018957**
Client Identification **COUMO-20181016**
Sampling Date **10/16/18, 15:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	34.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.37	mg/l		0.1			
Total Nitrogen (TKN)	< 0.1	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.37	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018958**
Client Identification **EVAMS-20181016**
Sampling Date **10/16/18, 13:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	32.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	2.23	mg/l		0.1			
Total Nitrogen (TKN)	0.231	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	2.0	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018959**
Client Identification **EVALSS-20181016**
Sampling Date **10/16/18, 14:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	94.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	1.66	mg/l		0.1			
Total Nitrogen (TKN)	0.158	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	1.5	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018960**
Client Identification **MONMN-20181016**
Sampling Date **10/16/18, 11:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.73	mg/l		0.1			
Total Nitrogen (TKN)	0.502	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.23	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018961**
Client Identification **MONMS-20181016**
Sampling Date **10/16/18, 12:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	24.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.56	mg/l		0.1			
Total Nitrogen (TKN)	0.532	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.032	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018962**
Client Identification **MONM-20181016**
Sampling Date **10/16/18, 10:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	620	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.19	mg/l		0.1			
Total Nitrogen (TKN)	< 0.1	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.19	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018963**
Client Identification **SEIMN-20181016**
Sampling Date **10/16/18, 09:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.25	mg/l		0.1			
Total Nitrogen (TKN)	< 0.1	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.25	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018964**
Client Identification **SEIMS-20181016**
Sampling Date **10/16/18, 11:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	13.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.58	mg/l		0.1			
Total Nitrogen (TKN)	0.331	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.25	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018965**
Client Identification **TOSMI-20181016**
Sampling Date **10/16/18, 14:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	38.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.92	mg/l		0.1			
Total Nitrogen (TKN)	0.128	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.79	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018966**
Client Identification **TOSMO-20181016**
Sampling Date **10/16/18, 15:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	< 0.1	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.54	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018967**
Client Identification **TYLMI-20181016**
Sampling Date **10/16/18, 13:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	170	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	1.71	mg/l		0.1			
Total Nitrogen (TKN)	0.610	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	1.1	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018968**
Client Identification **TYLMO-20181016**
Sampling Date **10/16/18, 12:45**

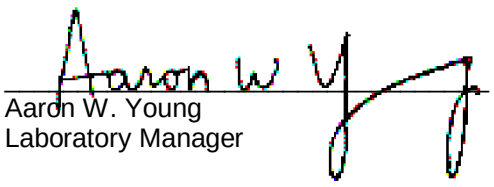
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	26.	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.239	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.30	mg/l		0.01	SM4500NO3	JC	10/19/18

AMTEST Identification Number **18-A018969**
Client Identification **QA53-20181016**
Sampling Date **10/16/18, 10:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	NG	10/17/18
Total Nitrogen (NOX&TKN)	0.26	mg/l		0.1			
Total Nitrogen (TKN)	0.192	mg/l		0.1	SM4500N	JC	10/31/18
Total Nitrate + Nitrite	0.073	mg/l		0.01	SM4500NO3	JC	10/19/18



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
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Kirkland, WA, 98034
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www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 18-A018955 to 18-A018969

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A018907	Fecal coliform	CFU/100 ml	< 2	< 2	
18-A018924	Fecal coliform	CFU/100 ml	780	760	2.6
18-A018931	Fecal coliform	CFU/100 ml	78.	76.	2.6
18-A018963	Fecal coliform	CFU/100 ml	4.	< 2	
18-A018931	Fecal coliform	CFU/100 ml	78.	< 2	
18-A018955	Total Nitrogen (TKN)	mg/l	0.140	0.201	36.
18-A018965	Total Nitrogen (TKN)	mg/l	0.128	< 0.1	
18-A019202	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019554	Total Nitrogen (TKN)	mg/l	0.417	0.406	2.7
18-A018924	Total Nitrate + Nitrite	mg/l	0.12	0.11	8.7
18-A018931	Total Nitrate + Nitrite	mg/l	0.51	0.51	0.00
18-A018964	Total Nitrate + Nitrite	mg/l	0.25	0.25	0.00
18-A018978	Total Nitrate + Nitrite	mg/l	0.58	0.58	0.00
18-A019065	Total Nitrate + Nitrite	mg/l	0.030	0.027	11.
18-A019106	Total Nitrate + Nitrite	mg/l	1.7	1.7	0.00
18-A019113	Total Nitrate + Nitrite	mg/l	0.010	0.017	52.

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A018955	Total Nitrogen (TKN)	mg/l	0.140	1.00	1.00	86.00 %
18-A018965	Total Nitrogen (TKN)	mg/l	0.128	1.01	1.00	88.20 %
18-A019202	Total Nitrogen (TKN)	mg/l	< 0.1	1.03	1.00	103.00 %
18-A019554	Total Nitrogen (TKN)	mg/l	0.417	1.33	1.00	91.30 %
18-A018924	Total Nitrate + Nitrite	mg/l	0.12	1.1	1.0	98.00 %
18-A018931	Total Nitrate + Nitrite	mg/l	0.51	1.6	1.0	109.00 %
18-A018964	Total Nitrate + Nitrite	mg/l	0.25	1.2	1.0	95.00 %
18-A018978	Total Nitrate + Nitrite	mg/l	0.58	1.6	1.0	102.00 %
18-A019065	Total Nitrate + Nitrite	mg/l	0.030	1.0	1.0	97.00 %
18-A019106	Total Nitrate + Nitrite	mg/l	1.7	2.7	1.0	100.00 %
18-A019113	Total Nitrate + Nitrite	mg/l	0.010	0.93	1.0	92.00 %

QC Summary for sample numbers: 18-A018955 to 18-A018969...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.09	109. %
Total Nitrogen (TKN)	mg/l	1.00	1.08	108. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-212

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20181016 18955	10/16/18	10:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20181016 56	10/16/18	14:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20181016 57	10/16/18	15:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20181016 58	10/16/18	13:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20181016 59	10/16/18	14:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20181016 60	10/16/18	11:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20181016 61	10/16/18	12:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20181016 62	10/16/18	10:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20181016 63	10/16/18	9:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20181016 64	10/16/18	11:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	10/16/18	1615	
Received by:	AMTEST T= 7.2	10/16/18	16:15	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-212

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20181016 18965	10/16/18	14:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMC-20181016 66	10/16/18	15:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20181016 67	10/16/18	13:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20181016 68	10/16/18	12:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA53-20181016 69	10/16/18	10:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time
Relinquished by:	OnSite Env	10/16/18	1645
Received by:	AMTEST T= 7.2	10/16/18	16:15
Relinquished by:			
Received by:			
Relinquished by:			
Received by:			

Comments/Special Instructions

EDDs - CSV

Reporting Limits:

Fecal Coliform - 1.0 cfu/100ml

Total Nitrogen - .10 mg/L

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Laboratory No. 10-212

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1016	10.16.18	10:00	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1016		14:45	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1016		15:00	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1016		13:45	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1016		14:00	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1016		11:55	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1016		12:18	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1016		10:45	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1016		9:05	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1016		11:25	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1016		14:20	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1016		15:15	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1016		13:15	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1016		12:45	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 53-20181016	↓	10:15	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by M Mullen Date 10.16.18 Received by _____ Date 10/16/18
Firm Herrera Inc Time 15:40 Firm ORE Time 1540

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Laboratory No. 10-212

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1016	10.16.18	10:00	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1016		14:45	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1016		15:00	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1016		13:45	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1016		14:60	Water	7	X	X	X	X	X	X	X	X	X			*
6	MONMN-2018 1016		11:55	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1016		12:15	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1016		10:45	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1016		9:05	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1016		11:25	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1016		14:20	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1016		15:15	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1016		13:15	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1016		12:45	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 53-2018 1016		10:15	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by M Mullen Date 10.16.18 15:40 Received by _____ Date 10/16/18
Firm Herrera Inc Time _____ Firm ORE Time 1540

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Mullen
Meter:	YSI ProDSS # 1
Date/Time:	10-15-18 / 15:30
Barometric Pressure Start of Day:	mmHg: 756.8 Time: 8:40 10.16.18
Barometric Pressure End of Day:	mmHg: 764.2 Time: 16:25 10.16.18

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.1	0	23.6	
Conductivity (µS/cm)	966	1,000	23.4	calibrated → 1000 (new reading)
Conductivity (µS/cm)	101.3	100	23.4	calibrated → 100.0 (new reading)
DO % Saturation	96.3	100		calibrated → 100% (new reading)

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.1	0	23.0	
Conductivity (µS/cm)	101.6	100	23.0	
DO % Saturation	101.5	100	22.6	calibrated → 100% (new reading)

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B. Kayser J. Geige

Sample Date: 10/16/18

Base Flow or Storm Event?

Sample Time: 10:00 QA 10:15 PDT

Field Filtered Time: 10:05 10:20 PST:
(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 55° sunny

Water Quality Sampling

Sample ID: COLM-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	Yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: ~~QA152018101~~ QA5320181016

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lamb **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): dry

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.7°

Specific Conductivity (µs/cm) 43.1

Dissolved Oxygen (mg/L) 2.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MEGAN MUELLER TODD PRESCOTT

Sample Date: 10/16/18 **Sample Time:** 14:45 PDT

Base Flow or Storm Event? BF **Field Filtered Time:** 14:50 PST

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 70 SUNNY

Water Quality Sampling

Sample ID: COUM1-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: CLEAR

Odor: NA

Sheen:

Floatables: WHITE FOAM (SMALL AMOUNT)

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Leutz **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.65

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.8°

Specific Conductivity (µs/cm) 338.6

Dissolved Oxygen (mg/L) 11.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Meghan Mullen Todd Prescott

Sample Date: 10/16/18 **Sample Time:** 13:00 PDT ✓ PST:

Base Flow or Storm Event? BF **Field Filtered Time:** 15:05 (Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 70 sunny

Water Quality Sampling

Sample ID: COUMO - 20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	N/A
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lemieux **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.29

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.5

Specific Conductivity (µs/cm) 250.6

Dissolved Oxygen (mg/L) 10.79

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Muller G. Kayser

Sample Date: 10/16/18 **Sample Time:** 13:45 (PDT) / PST

Base Flow or Storm Event? **Field Filtered Time:** 13:50

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 68° sunny

Water Quality Sampling

Sample ID: EVAMS 20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: CLEAR

Odor: N/A

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lantz **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.89

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.6°

Specific Conductivity (µs/cm) 215.4

Dissolved Oxygen (mg/L) 11.37

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Megan Mullen, Todd Prescott

Sample Date: 10/16/18 **Sample Time:** 14:00 PDT: ✓ PST:

Base Flow or Storm Event? BF **Field Filtered Time:** 14:05
(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 68 SUNNY

Water Quality Sampling

Sample ID: EVALSS - 20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: CLEAR

Odor: NA

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Lenth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.29

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.4°

Specific Conductivity (µs/cm) 208.6

Dissolved Oxygen (mg/L) 11.54

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G Kayser T Prescott

Sample Date: 10/16/18 Sample Time: 11:55 PDT / PST

Base Flow or Storm Event?

Field Filtered Time: 12:00 (Must filter within 15 minutes of collection)

SITE ID: MONMW

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 62° sunny

Water Quality Sampling

Sample ID: MONMW 20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: TURBID

Color: LIGHT YELLOW

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: T. Leutha Signature:

Date Checked: 11-21-18 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro~~ DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.0 → changed to '10.0', '9' marker obscured ## on SG in field

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.1

Specific Conductivity (µs/cm) 228.2

Dissolved Oxygen (mg/L) 10.64

↓ may also be 9.0 ft

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen, T Prescot J Geigel G Kayser

Sample Date: 10-16-18 Sample Time: 1215 PDT: X

Base Flow or Storm Event? Field Filtered Time: 1220 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 62 + Sunny

Water Quality Sampling

Sample ID: MONMS20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: cloudy clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: R. Lentz Signature:

Date Checked: 11-21-18 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6ft 8.5 inch

Reference Point (description): Top of PVC pipe

Water Quality Measurments

Temperature (°C) 8.5

Specific Conductivity (µs/cm) 370.7

Dissolved Oxygen (mg/L) ~~10.24~~ 9.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. Gregl, T. Prescott

Sample Date: 10/16/18 Sample Time: 10:45 PDT x PST

~~Base Flow~~ or Storm Event? Field Filtered Time: 10:50 (Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 55° Sunny

Water Quality Sampling

Sample ID: MONM-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: N/A

Odor: N/A

Sheen: Small amount P sheen

Floatables: N/A

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: T. Lemieux Signature:

Date Checked: 11-21-18 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A

Reference Point (description): N/A

Water Quality Measurments

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 243.3

Dissolved Oxygen (mg/L) 11.79

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Kayser T Gore

Sample Date: 10/16/18 **Sample Time:** 9:05 PDT: X PST:

Base Flow or Storm Event? **Field Filtered Time:** 9:10
(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 37° clear

Water Quality Sampling

Sample ID: SEIMN-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:
Filter blank sample ID:
Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
Color: none
Odor: none
Sheen: none
Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Leuth **Signature:**
Date Checked: 11-2-18 **Time:**
Data Entered into Database? YES / NO **initials:**
Date Entered: **Time:**
Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.72

Reference Point (description): top of bolt on side

Water Quality Measurments

Temperature (°C) 8.5°

Specific Conductivity (µs/cm) 122.7

Dissolved Oxygen (mg/L) 11.63

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. Gregel, T. Prescott

Sample Date: 10-16-18 Sample Time: 11:25 PDT X PST

Base Flow or Storm Event? Field Filtered Time: 1130 (Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 55° Sunny

Water Quality Sampling

Sample ID: SEIMS -20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: N/A

Odor: N/A

Sheen: N/A

Floatables: Yes, Foam (white)

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: J. Lovett Signature:

Date Checked: 11-21-18 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.70

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.1

Specific Conductivity (µs/cm) 122.1

Dissolved Oxygen (mg/L) 11.26

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MEGAN MULLEN TODD PRESCOTT

Sample Date: 10/16/18 **Sample Time:** 14:20 PDT: X PST:

Base Flow or Storm Event? BF **Field Filtered Time:** 14:25
(Must filter within 15 minutes of collection)

SITE ID: TOSM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: SUNNY, 70°

Water Quality Sampling

Sample ID: TOSM1-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	|
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	|
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	|
T Nitrogen	HDPE	250 ml	1	H_2SO_4	|
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	|
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	|

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	CLEAR
Color:	CLEAR
Odor:	NA
Sheen:	|
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Lenth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.72

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.5

Specific Conductivity (µs/cm) 326.8

Dissolved Oxygen (mg/L) 10.98

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Kayser, J Giegel

Sample Date: 10.16.18 **Sample Time:** 15:15 PDT: X PST:

Base Flow or Storm Event? (B)

Field Filtered Time: 15:20
(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny + 70°

Water Quality Sampling

Sample ID: ~~COL101020 18 TOTO~~ TOSMO-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Leuth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.56

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 16.0

Specific Conductivity (µs/cm) 276.5

Dissolved Oxygen (mg/L) 11.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Muellen, J. Gweagel

Sample Date: 10-16-2018 **Sample Time:** 1315 PDT: X PST:

Base Flow or Storm Event? **Field Filtered Time:** 1320
(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 70 ° sunny

Water Quality Sampling

Sample ID: TYLM1-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: N/A

Odor: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Leutch **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.64

Reference Point (description): Top of Culvert

Water Quality Measurments

Temperature (°C) 11.8

Specific Conductivity (µs/cm) 254.4

Dissolved Oxygen (mg/L) 10.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. Gregel, G Kayser

Sample Date: 10/16/18 **Sample Time:** 12:45 PDT: X

Base Flow or Storm Event? BF **Field Filtered Time:** 12:50 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 64°

Water Quality Sampling

Sample ID: TYLMO-20181016

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: CLEAR

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lenth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

~~YSI Pro Plus (15D100020)~~

~~YSI Pro DSS 1~~

~~YSI Pro DSS 2~~

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.84

Reference Point (description): TOP OF CULVERT

Water Quality Measurments

Temperature (°C) 8.7°

Specific Conductivity (µs/cm) 208.8

Dissolved Oxygen (mg/L) 11.57

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/16/2018 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/16/2018 / All locations, QA53 (COLM)

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	3	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	105	**±20**	11	**≤ 25**	NC	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	D=0.10	**≤ 25**	D=0.22	**≤ 25**	OK	NONE; MINOR EXCEEDANCE FD DIFFERENCE.
Hardness	OK / SM 2340B	NA	**NA**	7	**≤180**	≤1.0 mg/L 1.0 mg/L	114,108	**±25**	107	**±15**	2	**≤ 20**	13	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	6	**≤28**	≤1.0 mg/L 1.0 mg/L	119	**±25**	114	**±15**	1	**≤ 20**	0	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6	**≤28**	≤0.01 mg/L 0.01 mg/L	96	**±25**	97	**±20**	4	**≤ 20**	0	**≤ 20**	OK	None
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	15,3	**≤28**	≤0.1 mg/L 0.1 mg/L	86,88 95	**±25**	99-109	**±20**	D=0.061 , NC 0	**≤ 20**	D=0.052 20	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/16/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/16/2018 / All locations, QA53 (COLM)

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	7	**≤180**	≤1.0 µg/L 1.0 µg/L	98,99	**±25**	NR	**±15**	1	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	102,108	**±25**	NR	**±15**	9	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	7	**≤180**	≤1.0 µg/L 1.0 µg/L	93.93	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	100.98	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	NC	**≤ 35**	NC	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 16, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1810-329

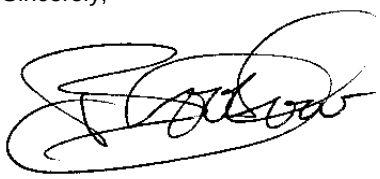
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on October 26, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

Case Narrative

Samples were collected on October 25, 2018 and received by the laboratory on October 26, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

TOC by SM 5310B Analysis

The sample COUMI-20181025 (10-329-02) was analyzed from a container preserved with HNO3. No sample container preserved with HCl was provided.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	10-329-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	10-329-02					
Total Suspended Solids	**67**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	10-329-03					
Total Suspended Solids	**5.4**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	10-329-04					
Total Suspended Solids	**5.8**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	10-329-05					
Total Suspended Solids	**8.2**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	10-329-06					
Total Suspended Solids	**8.6**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	10-329-07					
Total Suspended Solids	**3.6**	1.0	SM 2540D	10-29-18	10-30-18	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	10-329-08					
Total Suspended Solids	**6.4**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	10-329-09					
Total Suspended Solids	**39**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	10-329-10					
Total Suspended Solids	**32**	1.4	SM 2540D	10-29-18	10-30-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	10-329-11					
Total Suspended Solids	**10**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	10-329-12					
Total Suspended Solids	**10**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	10-329-13					
Total Suspended Solids	**11**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	10-329-14					
Total Suspended Solids	**55**	1.0	SM 2540D	10-29-18	10-30-18	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA54-20181025**					
Laboratory ID:	10-329-15					
Total Suspended Solids	**8.6**	1.0	SM 2540D	10-29-18	10-30-18	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1029W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-29-18	10-30-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-329-10								
	ORIG	DUP							
Total Suspended Solids	**32.3**	**30.9**	NA	NA	NA	NA	4	22	
SPIKE BLANK									
Laboratory ID:	SB1029W1								
	SB		SB		SB				
Total Suspended Solids	**85.0**		100	NA	85	79-114	NA	NA	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	10-329-01					
Turbidity	**0.45**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	10-329-02					
Turbidity	**19**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	10-329-03					
Turbidity	**4.7**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	10-329-04					
Turbidity	**3.3**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	10-329-05					
Turbidity	**4.2**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	10-329-06					
Turbidity	**5.1**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	10-329-07					
Turbidity	**2.5**	0.10	EPA 180.1	10-26-18	10-26-18	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	10-329-08					
Turbidity	**4.1**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	10-329-09					
Turbidity	**20**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	10-329-10					
Turbidity	**17**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	10-329-11					
Turbidity	**7.3**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	10-329-12					
Turbidity	**4.9**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	10-329-13					
Turbidity	**4.6**	0.10	EPA 180.1	10-26-18	10-26-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	10-329-14					
Turbidity	**21**	0.10	EPA 180.1	10-26-18	10-26-18	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA54-20181025**					
Laboratory ID:	10-329-15					
Turbidity	**3.9**	0.10	EPA 180.1	10-26-18	10-26-18	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1026W1					
Turbidity	**ND**	0.10	EPA 180.1	10-26-18	10-26-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-328-01								
	ORIG	DUP							
Turbidity	**12.1**	**12.1**	NA	NA	NA	NA	0	15	

Date of Report: November 16, 2018
Samples Submitted: October 26, 2018
Laboratory Reference: 1810-329
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	10-329-01					
Hardness	**14**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	10-329-02					
Hardness	**170**	5.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	10-329-03					
Hardness	**110**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	10-329-04					
Hardness	**100**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	10-329-05					
Hardness	**95**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	10-329-06					
Hardness	**110**	5.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	10-329-07					
Hardness	**150**	5.0	200.7/SM 2340B	10-31-18	11-1-18	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	10-329-08					
Hardness	**120**	5.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	10-329-09					
Hardness	**53**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	10-329-10					
Hardness	**57**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	10-329-11					
Hardness	**86**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	10-329-12					
Hardness	**98**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	10-329-13					
Hardness	**74**	1.0	200.7/SM 2340B	10-31-18	11-1-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	10-329-14					
Hardness	**80**	1.0	200.7/SM 2340B	10-31-18	11-1-18	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA54-20181025**					
Laboratory ID:	10-329-15					
Hardness	**100**	1.0	200.7/SM 2340B	10-31-18	11-1-18	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1031WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	10-31-18	11-1-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-329-01										
	ORIG	DUP									
Hardness	**14.0**	**13.9**	NA		NA	NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	10-329-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**155**	**151**	132	132	14.0	107	104	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB1031WH1										
	SB		SB			SB					
Hardness	**147**		132		NA	111		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	10-329-01					
Dissolved Organic Carbon	**7.7**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	10-329-02					
Dissolved Organic Carbon	**7.8**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	10-329-03					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	10-329-04					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	10-329-05					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	10-329-06					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	10-329-07					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	10-31-18	10-31-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	10-329-08					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	10-329-09					
Dissolved Organic Carbon	**3.1**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	10-329-10					
Dissolved Organic Carbon	**6.5**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	10-329-11					
Dissolved Organic Carbon	**8.8**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	10-329-12					
Dissolved Organic Carbon	**6.7**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	10-329-13					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	10-31-18	10-31-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	10-329-14					
Dissolved Organic Carbon	**5.4**	1.0	SM 5310B	10-31-18	10-31-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA54-20181025**					
Laboratory ID:	10-329-15					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	10-31-18	10-31-18	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1031D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	10-31-18	10-31-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-329-01								
	ORIG	DUP							
Dissolved Organic Carbon	**7.67**	**7.83**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	10-329-01								
	MS		MS		MS				
Dissolved Organic Carbon	**19.9**		10.0	7.67	122	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1031D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.6**		10.0	NA	116	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	10-329-01					
Total Phosphorus	**0.017**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	10-329-02					
Total Phosphorus	**0.12**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	10-329-03					
Total Phosphorus	**0.31**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	10-329-04					
Total Phosphorus	**0.018**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	10-329-05					
Total Phosphorus	**0.027**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	10-329-06					
Total Phosphorus	**0.051**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	10-329-07					
Total Phosphorus	**0.036**	0.010	EPA 365.1	11-1-18	11-2-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	10-329-08					
Total Phosphorus	**0.046**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	10-329-09					
Total Phosphorus	**0.12**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	10-329-10					
Total Phosphorus	**0.094**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	10-329-11					
Total Phosphorus	**0.086**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	10-329-12					
Total Phosphorus	**0.081**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	10-329-13					
Total Phosphorus	**0.060**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	10-329-14					
Total Phosphorus	**0.15**	0.010	EPA 365.1	11-1-18	11-2-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA54-20181025**					
Laboratory ID:	10-329-15					
Total Phosphorus	**0.054**	0.010	EPA 365.1	11-1-18	11-2-18	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	11-1-18	11-2-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-329-01								
	ORIG	DUP							
Total Phosphorus	**0.0170**	**0.0178**	NA	NA	NA	NA	5	12	
MATRIX SPIKE									
Laboratory ID:	10-329-01								
	MS		MS		MS				
Total Phosphorus	**0.251**		0.250	0.0170	94	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1101W1								
	SB		SB		SB				
Total Phosphorus	**0.228**		0.250	NA	91	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	10-329-01					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	10-329-02					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**9.7**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	10-329-03					
Copper	**3.1**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**140**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	10-329-04					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	10-329-05					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	10-329-06					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	10-329-07					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	10-329-08					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**11**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	10-329-09					
Copper	**1.0**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	10-329-10					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	10-329-11					
Copper	**9.9**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**56**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	10-329-12					
Copper	**4.7**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**16**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	10-329-13					
Copper	**7.6**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**14**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	10-329-14					
Copper	**7.6**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**33**	5.0	EPA 200.8	10-31-18	11-5-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA54-20181025**					
Laboratory ID:	10-329-15					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1031WH3					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-329-10										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-329-10										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**96.0**	**99.0**	100	100	ND	**96**	**99**	75-125	3	20	
Zinc	**112**	**116**	100	100	ND	**112**	**116**	75-125	3	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	10-329-01					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	10-329-02					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	10-329-03					
Copper	**2.8**	1.0	EPA 200.8		10-30-18	
Zinc	**120**	5.0	EPA 200.8		10-30-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	10-329-04					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	10-329-05					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	10-329-06					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	10-329-07					
Copper	**ND**	1.0	EPA 200.8		11-5-18	
Zinc	**ND**	5.0	EPA 200.8		11-5-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	10-329-08					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**6.2**	5.0	EPA 200.8		10-30-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	10-329-09					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	10-329-10					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	10-329-11					
Copper	**10**	1.0	EPA 200.8		10-30-18	
Zinc	**49**	5.0	EPA 200.8		10-30-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	10-329-12					
Copper	**4.0**	1.0	EPA 200.8		10-30-18	
Zinc	**13**	5.0	EPA 200.8		10-30-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	10-329-13					
Copper	**5.9**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	10-329-14					
Copper	**3.7**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA54-20181025**					
Laboratory ID:	10-329-15					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	

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DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1030D2					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Laboratory ID:	MB1030D1					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	10-346-12									
	ORIG	DUP								
Copper	**2.64**	**2.78**	NA	NA		NA	NA	5	20	
Zinc	**10.1**	**10.9**	NA	NA		NA	NA	8	20	
Laboratory ID:	10-329-01									
	ORIG	DUP								
Copper	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	10-346-12									
	MS	MSD	MS	MSD		MS	MSD			
Copper	**76.2**	**74.2**	80.0	80.0	2.64	**92**	**90**	75-125	3	20
Zinc	**89.2**	**90.8**	80.0	80.0	10.1	**99**	**101**	75-125	2	20
Laboratory ID:	10-329-01									
	MS	MSD	MS	MSD		MS	MSD			
Copper	**73.4**	**75.2**	80.0	80.0	ND	**92**	**94**	75-125	2	20
Zinc	**84.0**	**83.6**	80.0	80.0	ND	**105**	**105**	75-125	0	20

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 16 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181025	Water	18-A019579	Micro, NUT
COUMI-20181025	Water	18-A019580	Micro, NUT
COUMO-20181025	Water	18-A019581	Micro, NUT
EVAMS-20181025	Water	18-A019582	Micro, NUT
EVALSS-20181025	Water	18-A019583	Micro, NUT
MONMN-20181025	Water	18-A019584	Micro, NUT
MONMS-20181025	Water	18-A019585	Micro, NUT
MONM-20181025	Water	18-A019586	Micro, NUT
SEIMN-20181025	Water	18-A019587	Micro, NUT
SEIMS-20181025	Water	18-A019588	Micro, NUT
TOSMI-20181025	Water	18-A019589	Micro, NUT
TOSMO-20181025	Water	18-A019590	Micro, NUT
TYLMI-20181025	Water	18-A019591	Micro, NUT
TYLMO-20181025	Water	18-A019592	Micro, NUT
QA54-20181025	Water	18-A019593	Micro, NUT

Your samples were received on Friday, October 26, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 16 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 10-329

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 10-329
All results reported on an as received basis.

Date Received: 10/26/18
Date Reported: 11/16/18

AMTEST Identification Number **18-A019579**
Client Identification **COLM-20181025**
Sampling Date **10/25/18, 22:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.30	mg/l		0.1			
Total Nitrogen (TKN)	0.280	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	0.023	mg/l		0.01	SM4500NO3	JC	11/05/18

AMTEST Identification Number **18-A019580**
Client Identification **COUMI-20181025**
Sampling Date **10/25/18, 20:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	460	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.69	mg/l		0.1			
Total Nitrogen (TKN)	0.426	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	0.26	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019581**
Client Identification **COUMO-20181025**
Sampling Date **10/25/18, 20:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.581	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	0.37	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019582**
Client Identification **EVAMS-20181025**
Sampling Date **10/25/18, 21:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	98.	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	2.17	mg/l		0.1			
Total Nitrogen (TKN)	0.370	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	1.8	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019583**
Client Identification **EVALSS-20181025**
Sampling Date **10/25/18, 21:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	90.	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	1.55	mg/l		0.1			
Total Nitrogen (TKN)	0.248	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	1.3	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019584**
Client Identification **MONMN-20181025**
Sampling Date **10/25/18, 22:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	78.	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.26	mg/l		0.1			
Total Nitrogen (TKN)	0.255	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	< 0.01	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019585**
Client Identification **MONMS-20181025**
Sampling Date **10/25/18, 22:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	90.	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.52	mg/l		0.1			
Total Nitrogen (TKN)	0.458	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	0.062	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019586**
Client Identification **MONM-20181025**
Sampling Date **10/25/18, 23:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	540	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.65	mg/l		0.1			
Total Nitrogen (TKN)	0.503	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	0.15	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019587**
Client Identification **SEIMN-20181025**
Sampling Date **10/25/18, 23:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	660	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.312	mg/l		0.1	SM4500N	JC	11/16/18
Total Nitrate + Nitrite	0.23	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019588**
Client Identification **SEIMS-20181025**
Sampling Date **10/25/18, 23:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	48.	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.472	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.21	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019589**
Client Identification **TOSMI-20181025**
Sampling Date **10/25/18, 20:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	760	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	1.52	mg/l		0.1			
Total Nitrogen (TKN)	0.626	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.89	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019590**
Client Identification **TOSMO-20181025**
Sampling Date **10/25/18, 21:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	660	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.87	mg/l		0.1			
Total Nitrogen (TKN)	0.312	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.56	mg/l		0.01	SM4500NO3	JC	10/29/18

AMTEST Identification Number **18-A019591**
Client Identification **TYLMI-20181025**
Sampling Date **10/25/18, 21:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	320	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.419	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.53	mg/l		0.01	SM4500NO3	JC	11/05/18

AMTEST Identification Number **18-A019592**
Client Identification **TYLMO-20181025**
Sampling Date **10/25/18, 21:30**

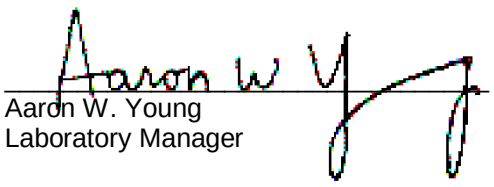
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	500	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.73	mg/l		0.1			
Total Nitrogen (TKN)	0.536	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.19	mg/l		0.01	SM4500NO3	JC	11/05/18

AMTEST Identification Number **18-A019593**
Client Identification **QA54-20181025**
Sampling Date **10/25/18, 22:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	70.	CFU/100 ml		2	SM 9222D	JM	10/26/18
Total Nitrogen (NOX&TKN)	0.36	mg/l		0.1			
Total Nitrogen (TKN)	0.267	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.095	mg/l		0.01	SM4500NO3	JC	11/05/18



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
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AMTEST LABORATORIES

Professional Analytical Services

QC Summary for sample numbers: 18-A019579 to 18-A019593

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A019575	Fecal coliform	CFU/100 ml	980	1200	20.
18-A019586	Fecal coliform	CFU/100 ml	540	500	7.7
18-A019600	Fecal coliform	CFU/100 ml	440	320	32.
18-A019643	Total Nitrogen (TKN)	mg/l	0.699	0.710	1.6
18-A019657	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019917	Total Nitrogen (TKN)	mg/l	0.296	0.279	5.9
18-A019966	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019563	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019587	Total Nitrogen (TKN)	mg/l	0.312	0.350	11.
18-A020216	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019276	Total Nitrate + Nitrite	mg/l	0.21	0.22	4.7
18-A019304	Total Nitrate + Nitrite	mg/l	0.18	0.19	5.4
18-A019324	Total Nitrate + Nitrite	mg/l	1.8	1.8	0.00
18-A019392	Total Nitrate + Nitrite	mg/l	0.42	0.40	4.9
18-A019501	Total Nitrate + Nitrite	mg/l	0.082	0.077	6.3
18-A019511	Total Nitrate + Nitrite	mg/l	< 0.01	< 0.01	
18-A019580	Total Nitrate + Nitrite	mg/l	0.26	0.27	3.8
18-A019590	Total Nitrate + Nitrite	mg/l	0.56	0.58	3.5
18-A019593	Total Nitrate + Nitrite	mg/l	0.095	0.095	0.00
18-A019649	Total Nitrate + Nitrite	mg/l	0.38	0.32	17.
18-A019808	Total Nitrate + Nitrite	mg/l	0.15	0.17	12.
18-A019811	Total Nitrate + Nitrite	mg/l	0.53	0.50	5.8
18-A019923	Total Nitrate + Nitrite	mg/l	0.15	0.15	0.00

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A019643	Total Nitrogen (TKN)	mg/l	0.699	1.52	1.00	82.10 %
18-A019657	Total Nitrogen (TKN)	mg/l	< 0.1	0.855	1.00	85.50 %
18-A019917	Total Nitrogen (TKN)	mg/l	0.296	1.13	1.00	83.40 %
18-A019966	Total Nitrogen (TKN)	mg/l	< 0.1	0.870	1.00	87.00 %
18-A019563	Total Nitrogen (TKN)	mg/l	< 0.1	0.891	1.00	89.10 %
18-A019587	Total Nitrogen (TKN)	mg/l	0.312	1.34	1.00	102.80 %
18-A020216	Total Nitrogen (TKN)	mg/l	< 0.1	0.904	1.00	90.40 %
18-A019276	Total Nitrate + Nitrite	mg/l	0.21	1.2	1.0	99.00 %
18-A019304	Total Nitrate + Nitrite	mg/l	0.18	1.1	1.0	92.00 %
18-A019324	Total Nitrate + Nitrite	mg/l	1.8	2.7	1.0	90.00 %
18-A019392	Total Nitrate + Nitrite	mg/l	0.42	1.4	1.0	98.00 %
18-A019501	Total Nitrate + Nitrite	mg/l	0.082	1.1	1.0	101.80 %
18-A019511	Total Nitrate + Nitrite	mg/l	< 0.01	1.0	1.0	100.00 %
18-A019580	Total Nitrate + Nitrite	mg/l	0.26	1.3	1.0	104.00 %

QC Summary for sample numbers: 18-A019579 to 18-A019593...

MATRIX SPIKES continued....

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A019590	Total Nitrate + Nitrite	mg/l	0.56	1.6	1.0	104.00 %
18-A019593	Total Nitrate + Nitrite	mg/l	0.095	1.2	1.0	110.50 %
18-A019649	Total Nitrate + Nitrite	mg/l	0.38	1.2	1.0	82.00 %
18-A019808	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %
18-A019811	Total Nitrate + Nitrite	mg/l	0.53	1.5	1.0	97.00 %
18-A019923	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.960	96.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.953	95.3 %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	1.03	103. %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	0.014
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	0.013

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-329

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20181025 19579	10/25/18	22:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20181025 80	10/25/18	20:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20181025 81	10/25/18	20:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20181025 82	10/25/18	21:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20181025 83	10/25/18	21:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20181025 84	10/25/18	22:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20181025 85	10/25/18	22:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20181025 86	10/25/18	23:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20181025 87	10/25/18	23:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20181025 88	10/25/18	23:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by: Matthew Lirow	OSE	10/26/18	1230	
Received by:	AMTEST T= 4.0	10/26/18	12:30	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

AMTEST

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-329

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20181016 19589	10/25/18	20:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20181016 90	10/25/18	21:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20181016 91	10/25/18	21:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20181016 92	10/25/18	21:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA54-20181016 93	10/25/18	22:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by: Heather Lisec	OSE	10/26/18	1230	
Received by:	AMTEST	10/26/18	12:30	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 10-329

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1025	10/25/18	22:50	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1025		20:50	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1025		20:25	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1025		21:00	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1025		21:30	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1025		22:15	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1025		22:40	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1025		23:40	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1025		23:30	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1025		23:20	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1025		20:30	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1025		21:00	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1025		21:45	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1025		21:30	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 54 20181025		22:30	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by J Geige Date 10/25/18 Received by Eileen Clark Date 10/26/18
Firm Herrera Environmental Time 23:50 Firm Alpha Time 10:27
Relinquished by Eileen Clark Date 10/26/18 Received by [illegible] Date 10/26/18
Firm Alpha Time 11:45 Firm OSE Time 1045

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

OnSite Environmental Inc.
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Page ___of___

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No.

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
	COLM-2018 1025	10/25/18	22:50	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2018 1025		20:50	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2018 1025		20:25	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2018 1025		21:00	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2018 1025		21:30	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2018 1025		22:15	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2018 1025		22:40	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2018 1025		23:10	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2018 1025		23:30	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2018 1025		23:20	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2018 1025		20:30	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2018 1025		21:00	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2018 1025		21:45	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2018 1025		21:30	Water	7	X	X	X	X	X	X	X	X	X			
	QA 5 4 2018 1025		22:30	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by J Geigel Date 10/25/18 Received by Eileen Clark Date 10/26/18
Firm Herrera Environmental Time 23:50 Firm Alpha Time 10:27

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

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Laboratory No.

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
	COLM-2018 1025	10/25/18	22:50	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2018 1025		20:50	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2018 1025		20:25	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2018 1025		21:00	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2018 1025		21:30	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2018 1025		22:15	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2018 1025		22:40	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2018 1025		23:40	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2018 1025		23:30	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2018 1025		23:20	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2018 1025		20:30	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2018 1025		21:00	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2018 1025		21:45	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2018 1025		21:30	Water	7	X	X	X	X	X	X	X	X	X			
	QA 54 20181025		22:30	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by J Geigel Date 10/25/18 Received by _____ Date _____
Firm Herrera Environmental Time 23:50 Firm _____ Time _____

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	Pro DSS 1
Date/Time:	10/25/18 @ 15:50
Barometric Pressure Start of Day:	mmHg: 759.1 Time: 16:06
Barometric Pressure End of Day:	mmHg: 757.4 Time: 10:15 / 10.26.18

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	7.5	0	24.1	
Conductivity (µS/cm)	1000	1,000	24.0	
Conductivity (µS/cm)	101.8	100	24.1	
DO % Saturation	~~97.8~~ 101.1	100	23.2	Calibrated NW

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.4	0	23.3	@ Herrera DI
Conductivity (µS/cm)	100.7	100	~~23.8~~	
DO % Saturation	99.5	100	23.3	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Mullen
Meter:	Pro PSS 2
Date/Time:	10/25/16 15:50
Barometric Pressure Start of Day:	mmHg: 759.4 Time: 16:06
Barometric Pressure End of Day:	mmHg: 757.7 Time: 10 15/10/26/16

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	6.6	0	24.5	
Conductivity (µS/cm)	1001	1,000	24.3	
Conductivity (µS/cm)	102.8	100	24.3	Calibrated new SpC 100.1
DO % Saturation	97.7	100	23.7	calibrated new value: 99.9

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.3	0	23.7	Herrera DI
Conductivity (µS/cm)	98.1	100	24.0	
DO % Saturation	98.2	100	23.4	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Ifft, T. Prescott

Sample Date: 10/25/18 **Sample Time:** 20:30 PDT: ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 20:35 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 55°

HERRERA

Water Quality Sampling

Sample ID: TOSMI-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	CLEAR
Color:	MILD YELLOW
Odor:	NA
Sheen:	NA
Floatables:	NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Cook **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.76

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.1°

Specific Conductivity (µs/cm) 178.6

Dissolved Oxygen (mg/L) 10.04

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller J Gerow

Sample Date: 10/25/18 **Sample Time:** 21:00 PDT

Base Flow or Storm Event? Storm **Field Filtered Time:** 21:05 PST

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 53° rainy

Water Quality Sampling

Sample ID: TOSMO-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E. Leutha **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.59

Reference Point (description): 56

Water Quality Measurments

Temperature (°C) 11.4

Specific Conductivity (µs/cm) 209.8

Dissolved Oxygen (mg/L) 10.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mullen J. Berg

Sample Date: 10/25/18 **Sample Time:** 21:45 PDT

Base Flow or Storm Event? Storm **Field Filtered Time:** 21:50 PST

(Must filter within 15 minutes of collection)

SITE ID: TYLMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 55° rainy

Water Quality Sampling

Sample ID: TYLMI-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	↓
Transfer blank sample ID:	↓

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lemieux **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.55

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 12.5

Specific Conductivity (µs/cm) 167.0

Dissolved Oxygen (mg/L) 9.60

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mullen J Geiger

Sample Date: 10/25/18 **Sample Time:** 21:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 21:35 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 53° rainy

Water Quality Sampling

Sample ID: TYLMO.20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	none
Odor:	decaying material smell
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lemith **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.80

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 11.2

Specific Conductivity (µs/cm) 170.7

Dissolved Oxygen (mg/L) 10.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Ifthner, T. Prescott

Sample Date: 10/25/18 **Sample Time:** 22:50 PDT: ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 23:00 PST:

(Must filter within 15 minutes of collection)

SITE ID: ~~COL LAND~~ CoL M

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 55°

HERRERA

Water Quality Sampling

Sample ID: CoLM-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	S
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	Colorless
Odor:	Odorless
Sheen:	NA
Floatables:	~~NA~~

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Leuth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.40

Reference Point (description): SG.

Water Quality Measurments

Temperature (°C) 10.6

Specific Conductivity (µs/cm) 41.6

Dissolved Oxygen (mg/L) 3.27

ODD how little flow there is! check for beaver dam upstream!

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Miller J Gosz

Sample Date: 10/25/18 **Sample Time:** 20:50 PDT

Base Flow or Storm Event? **Field Filtered Time:** 20:55 PST

(Must filter within 15 minutes of collection)

SITE ID: COUMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 53° rainy

Water Quality Sampling

Sample ID: COUMI-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	light yellow
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Leuth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.62 → MM assume 2.62

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.9°

Specific Conductivity (µs/cm) 333.0

Dissolved Oxygen (mg/L) 10.74

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen J Gerard

Sample Date: 10/25/18 **Sample Time:** 20:25 (PDT) / PST

Base Flow or Storm Event? (circled)

Field Filtered Time: 20:30
(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 53° rainy

Water Quality Sampling

Sample ID: COUMO-2018 1025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	N/A
Filter blank sample ID:	↓
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lemieux **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.2

Specific Conductivity (µs/cm) 222.1

Dissolved Oxygen (mg/L) 10.18

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Effner, T. Prescott

Sample Date: 10/25/18 **Sample Time:** 21:00 PDT: ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 21:10 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 56°

Water Quality Sampling

Sample ID: EVAMS-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	V. light yellow/brown
Odor:	odorless
Sheen:	NA
Floatables:	None

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E. Leuth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.91

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.8

Specific Conductivity (µs/cm) 217 → MM assume 217.0

Dissolved Oxygen (mg/L) 10.6

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, T. Prescott

Sample Date: 10/25/18 **Sample Time:** 21:30 PDT: ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 21:40 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 55°

Water Quality Sampling

Sample ID: EVALSS-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	✓
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	X
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	Colorless
Odor:	odorless
Sheen:	None
Floatables:	NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Leitch **Signature:**

Date Checked: 11-2-18 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 207 → MM assume 202.0

Dissolved Oxygen (mg/L) 10.86

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen, J Gorge

Sample Date: 10/25/18

Sample Time: 22:15 / 22:30 PDT

Base Flow or Storm Event? (8)

Field Filtered Time: 22:20 / 22:35 PST

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 55° rainy

Water Quality Sampling

Sample ID: MONMN 20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	Yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	QA54 - 20181025
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	cloudy clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S Louth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.00 → MM assume 10.00 OR 9.00, noted in spreadsheet

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.9

Specific Conductivity (µs/cm) 241.8

Dissolved Oxygen (mg/L) 9.74

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mullin J Greig

Sample Date: 10/25/18 **Sample Time:** 22:40 (PDT)

Base Flow or Storm Event? (B) **Field Filtered Time:** 22:45 (PST)

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 55° rainy

Water Quality Sampling

Sample ID: MONMS-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	ND
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	ND
Filter blank sample ID:	↓
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	some clear
Color:	none
Odor:	decaying natural
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: JG **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100028)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 7.75

MM may be 6.75 based on previous measurements

Reference Point (description): top of PVC pipe

Water Quality Measurments

Temperature (°C) 11.3

Specific Conductivity (µs/cm) 339.9

Dissolved Oxygen (mg/L) 8.62

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen J Gerow

Sample Date: 10/25/18 **Sample Time:** ~~11:40~~ 23:40 PDT

Base Flow or Storm Event? Base **Field Filtered Time:** 23:45 PST

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 55° rainy

Water Quality Sampling

Sample ID: MONM 20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NN
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	decaying material
Sheen:	none
Floatables:	light foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lemth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A

Reference Point (description):

Water Quality Measurments

Temperature (°C) 11.1

Specific Conductivity (µs/cm) 251.1

Dissolved Oxygen (mg/L) 10.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Ifthen, T. Prescott

Sample Date: 10/25/18 **Sample Time:** 18:30 PDT: ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 23:40 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 55°

Water Quality Sampling

Sample ID: SEIMN-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	CLEAR
Color:	COLORLESS
Odor:	NONE
Sheen:	NONE
Floatables:	NONE

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Leuth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.7 DOWN

Reference Point (description): TOP OF BOLT

Water Quality Measurments

Temperature (°C) 10.6

Specific Conductivity (µs/cm) 116 → MM assume 116.0

Dissolved Oxygen (mg/L) 10.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller J Gorge

Sample Date: 10/25/18 **Sample Time:** 23:20 PDT

Base Flow or Storm Event? Storm **Field Filtered Time:** 23:25 PST

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 55° rainy

Water Quality Sampling

Sample ID: SEIMS 20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	
Transfer blank sample ID:	↓

Visual and Olfactory Conditions:

Clarity:	clear
Color:	light yellow
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lentz **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.74

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.9

Specific Conductivity (µs/cm) 122.5

Dissolved Oxygen (mg/L) 10.17

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/18/2018 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/25/2018 / All locations, QA54 (MONMN)

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	5	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	85	**±20**	4	**≤ 25**	0	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	0	**≤ 25**	27	**≤ 25**	OK	J MONMN DUE TO FD RPD
Hardness	OK / SM 2340B	NA	**NA**	7	**≤180**	≤1.0 mg/L 1.0 mg/L	107,104	**±25**	111	**±15**	1	**≤ 20**	9.5	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	6	**≤28**	≤1.0 mg/L 1.0 mg/L	122	**±25**	116	**±15**	2	**≤ 20**	0	**≤ 20**	OK	NONE; INCORRECT PRESERVATIVE USED FOR COUMI. LCS LAB LIMIT 20.
Total Phosphorus	OK / EPA 365.1	NA	**NA**	8	**≤28**	≤0.01 mg/L 0.01 mg/L	94	**±25**	91	**±20**	5	**≤ 20**	5.7	**≤ 20**	OK	None
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	22,11	**≤28**	≤0.1 mg/L 0.1 mg/L	103,104	**±25**	92-104	**±20**	11 3.8, 3.5	**≤ 20**	D=0.012 NC	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/18/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/25/2018 / All locations, QA54 (MONMN)

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	11	**≤180**	≤1.0 µg/L 1.0 µg/L	96,99	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	11	**≤180**	≤5.0 µg/L 5.0 µg/L	112,116	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	90-94	**±25**	NR	**±15**	5, NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	99-105	**±25**	NR	**±15**	8, NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	7.7	**≤ 35**	11	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 13, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1810-346

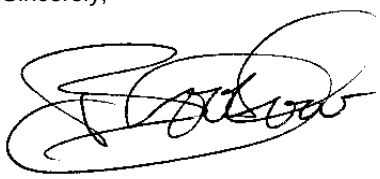
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on October 27, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: November 13, 2018
Samples Submitted: October 27, 2018
Laboratory Reference: 1810-346
Project: 14-05806-000

Case Narrative

Samples were collected on October 27, 2018 and received by the laboratory on October 27, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: November 13, 2018
Samples Submitted: October 27, 2018
Laboratory Reference: 1810-346
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUMI-20181027**					
Laboratory ID:	10-346-01					
Total Suspended Solids	**130**	1.4	SM 2540D	10-29-18	10-30-18	
Client ID:	**COUMO-20181027**					
Laboratory ID:	10-346-02					
Total Suspended Solids	**130**	2.5	SM 2540D	10-29-18	10-30-18	
Client ID:	**EVAMS-20181027**					
Laboratory ID:	10-346-03					
Total Suspended Solids	**27**	1.7	SM 2540D	10-29-18	10-30-18	
Client ID:	**EVALSS-20181027**					
Laboratory ID:	10-346-04					
Total Suspended Solids	**54**	2.5	SM 2540D	10-29-18	10-30-18	
Client ID:	**MONMN-20181027**					
Laboratory ID:	10-346-05					
Total Suspended Solids	**200**	2.5	SM 2540D	10-29-18	10-30-18	
Client ID:	**MONMS-20181027**					
Laboratory ID:	10-346-06					
Total Suspended Solids	**8.8**	1.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**MONM-20181027**					
Laboratory ID:	10-346-07					
Total Suspended Solids	**190**	5.0	SM 2540D	10-29-18	10-30-18	

Date of Report: November 13, 2018
Samples Submitted: October 27, 2018
Laboratory Reference: 1810-346
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSMI-20181027**					
Laboratory ID:	10-346-08					
Total Suspended Solids	**200**	2.5	SM 2540D	10-29-18	10-30-18	
Client ID:	**TOSMO-20181027**					
Laboratory ID:	10-346-09					
Total Suspended Solids	**990**	5.0	SM 2540D	10-29-18	10-30-18	
Client ID:	**TYLMI-20181027**					
Laboratory ID:	10-346-10					
Total Suspended Solids	**53**	2.5	SM 2540D	10-29-18	10-30-18	
Client ID:	**TYLMO-20181027**					
Laboratory ID:	10-346-11					
Total Suspended Solids	**47**	2.5	SM 2540D	10-29-18	10-30-18	
Client ID:	**QA55-20181027**					
Laboratory ID:	10-346-12					
Total Suspended Solids	**560**	5.0	SM 2540D	10-29-18	10-30-18	

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TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1029W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-29-18	10-30-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-346-09								
	ORIG	DUP							
Total Suspended Solids	**990**	**968**	NA	NA	NA	NA	2	22	
SPIKE BLANK									
Laboratory ID:	SB1029W2								
	SB		SB		SB				
Total Suspended Solids	**95.0**		100	NA	95	76-114	NA	NA	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUMI-20181027**					
Laboratory ID:	10-346-01					
Turbidity	**70**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**COUMO-20181027**					
Laboratory ID:	10-346-02					
Turbidity	**40**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**EVAMS-20181027**					
Laboratory ID:	10-346-03					
Turbidity	**11**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**EVALSS-20181027**					
Laboratory ID:	10-346-04					
Turbidity	**20**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**MONMN-20181027**					
Laboratory ID:	10-346-05					
Turbidity	**91**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**MONMS-20181027**					
Laboratory ID:	10-346-06					
Turbidity	**6.1**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**MONM-20181027**					
Laboratory ID:	10-346-07					
Turbidity	**81**	0.10	EPA 180.1	10-29-18	10-29-18	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSMI-20181027**					
Laboratory ID:	10-346-08					
Turbidity	**46**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**TOSMO-20181027**					
Laboratory ID:	10-346-09					
Turbidity	**270**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**TYLMI-20181027**					
Laboratory ID:	10-346-10					
Turbidity	**33**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**TYLMO-20181027**					
Laboratory ID:	10-346-11					
Turbidity	**31**	0.10	EPA 180.1	10-29-18	10-29-18	
Client ID:	**QA55-20181027**					
Laboratory ID:	10-346-12					
Turbidity	**180**	0.10	EPA 180.1	10-29-18	10-29-18	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1029W1					
Turbidity	**ND**	0.10	EPA 180.1	10-29-18	10-29-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-346-01								
	ORIG	DUP							
Turbidity	**69.8**	**71.5**	NA	NA	NA	NA	2	15	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUMI-20181027**					
Laboratory ID:	10-346-01					
Hardness	**66**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**COUMO-20181027**					
Laboratory ID:	10-346-02					
Hardness	**26**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**EVAMS-20181027**					
Laboratory ID:	10-346-03					
Hardness	**84**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**EVALSS-20181027**					
Laboratory ID:	10-346-04					
Hardness	**79**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**MONMN-20181027**					
Laboratory ID:	10-346-05					
Hardness	**63**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**MONMS-20181027**					
Laboratory ID:	10-346-06					
Hardness	**64**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**MONM-20181027**					
Laboratory ID:	10-346-07					
Hardness	**79**	1.0	200.7/SM 2340B	11-1-18	11-1-18	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSMI-20181027**					
Laboratory ID:	10-346-08					
Hardness	**23**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**TOSMO-20181027**					
Laboratory ID:	10-346-09					
Hardness	**55**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**TYLMI-20181027**					
Laboratory ID:	10-346-10					
Hardness	**27**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**TYLMO-20181027**					
Laboratory ID:	10-346-11					
Hardness	**23**	1.0	200.7/SM 2340B	11-1-18	11-1-18	
Client ID:	**QA55-20181027**					
Laboratory ID:	10-346-12					
Hardness	**45**	1.0	200.7/SM 2340B	11-1-18	11-1-18	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	11-1-18	11-1-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-346-03										
	ORIG	DUP									
Hardness	**84.4**	**86.9**	NA		NA	NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	10-346-03										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**244**	**236**	132	132	84.4	121	115	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB1101WH1										
	SB		SB			SB					
Hardness	**139**		132		NA	105		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUMI-20181027**					
Laboratory ID:	10-346-01					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**COUMO-20181027**					
Laboratory ID:	10-346-02					
Dissolved Organic Carbon	**8.4**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**EVAMS-20181027**					
Laboratory ID:	10-346-03					
Dissolved Organic Carbon	**6.9**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**EVALSS-20181027**					
Laboratory ID:	10-346-04					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**MONMN-20181027**					
Laboratory ID:	10-346-05					
Dissolved Organic Carbon	**14**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**MONMS-20181027**					
Laboratory ID:	10-346-06					
Dissolved Organic Carbon	**7.6**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**MONM-20181027**					
Laboratory ID:	10-346-07					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	11-6-18	11-6-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSMI-20181027**					
Laboratory ID:	10-346-08					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**TOSMO-20181027**					
Laboratory ID:	10-346-09					
Dissolved Organic Carbon	**8.3**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**TYLMI-20181027**					
Laboratory ID:	10-346-10					
Dissolved Organic Carbon	**7.1**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**TYLMO-20181027**					
Laboratory ID:	10-346-11					
Dissolved Organic Carbon	**6.4**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**QA55-20181027**					
Laboratory ID:	10-346-12					
Dissolved Organic Carbon	**8.6**	1.0	SM 5310B	11-6-18	11-6-18	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1106D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	11-6-18	11-6-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-006-03								
	ORIG	DUP							
Dissolved Organic Carbon	**10.9**	**11.1**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	11-006-03								
	MS		MS		MS				
Dissolved Organic Carbon	**20.7**		10.0	10.9	98	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1106D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.86**		10.0	NA	99	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUMI-20181027**					
Laboratory ID:	10-346-01					
Total Phosphorus	**0.34**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**COUMO-20181027**					
Laboratory ID:	10-346-02					
Total Phosphorus	**0.31**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**EVAMS-20181027**					
Laboratory ID:	10-346-03					
Total Phosphorus	**0.072**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**EVALSS-20181027**					
Laboratory ID:	10-346-04					
Total Phosphorus	**0.12**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**MONMN-20181027**					
Laboratory ID:	10-346-05					
Total Phosphorus	**0.65**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**MONMS-20181027**					
Laboratory ID:	10-346-06					
Total Phosphorus	**0.074**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**MONM-20181027**					
Laboratory ID:	10-346-07					
Total Phosphorus	**0.41**	0.010	EPA 365.1	11-1-18	11-2-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSMI-20181027**					
Laboratory ID:	10-346-08					
Total Phosphorus	**0.25**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**TOSMO-20181027**					
Laboratory ID:	10-346-09					
Total Phosphorus	**0.91**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**TYLMI-20181027**					
Laboratory ID:	10-346-10					
Total Phosphorus	**0.17**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**TYLMO-20181027**					
Laboratory ID:	10-346-11					
Total Phosphorus	**0.16**	0.010	EPA 365.1	11-1-18	11-2-18	
Client ID:	**QA55-20181027**					
Laboratory ID:	10-346-12					
Total Phosphorus	**0.54**	0.010	EPA 365.1	11-1-18	11-2-18	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W2					
Total Phosphorus	**ND**	0.010	EPA 365.1	11-1-18	11-2-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-346-01								
	ORIG	DUP							
Total Phosphorus	**0.340**	**0.346**	NA	NA	NA	NA	2	12	
MATRIX SPIKE									
Laboratory ID:	10-346-01								
	MS		MS		MS				
Total Phosphorus	**0.586**		0.250	0.340	98	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1101W2								
	SB		SB		SB				
Total Phosphorus	**0.229**		0.250	NA	92	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUMI-20181027**					
Laboratory ID:	10-346-01					
Copper	**7.0**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**120**	5.0	EPA 200.8	10-31-18	10-31-18	
Client ID:	**COUMO-20181027**					
Laboratory ID:	10-346-02					
Copper	**13**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**110**	5.0	EPA 200.8	10-31-18	10-31-18	
Client ID:	**EVAMS-20181027**					
Laboratory ID:	10-346-03					
Copper	**1.5**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**22**	5.0	EPA 200.8	10-31-18	10-31-18	
Client ID:	**EVALSS-20181027**					
Laboratory ID:	10-346-04					
Copper	**1.7**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**6.0**	5.0	EPA 200.8	10-31-18	10-31-18	
Client ID:	**MONMN-20181027**					
Laboratory ID:	10-346-05					
Copper	**7.5**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**77**	5.0	EPA 200.8	10-31-18	10-31-18	
Client ID:	**MONMS-20181027**					
Laboratory ID:	10-346-06					
Copper	**2.6**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**5.9**	5.0	EPA 200.8	10-31-18	10-31-18	
Client ID:	**MONM-20181027**					
Laboratory ID:	10-346-07					
Copper	**7.3**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**95**	5.0	EPA 200.8	10-31-18	10-31-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSMI-20181027**					
Laboratory ID:	10-346-08					
Copper	**13**	1.0	EPA 200.8	10-31-18	10-31-18	
Zinc	**110**	5.0	EPA 200.8	10-31-18	10-31-18	
Client ID:	**TOSMO-20181027**					
Laboratory ID:	10-346-09					
Copper	**22**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**190**	13	EPA 200.8	10-31-18	11-5-18	
Client ID:	**TYLMI-20181027**					
Laboratory ID:	10-346-10					
Copper	**9.9**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**34**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**TYLMO-20181027**					
Laboratory ID:	10-346-11					
Copper	**7.9**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**27**	5.0	EPA 200.8	10-31-18	11-5-18	
Client ID:	**QA55-20181027**					
Laboratory ID:	10-346-12					
Copper	**18**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**170**	5.0	EPA 200.8	10-31-18	11-5-18	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1031WH2					
Copper	**ND**	1.0	EPA 200.8	10-31-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	10-31-18	11-5-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-346-06										
	ORIG	DUP									
Copper	**2.64**	**2.70**	NA	NA		NA		NA	2	20	
Zinc	**5.94**	**5.58**	NA	NA		NA		NA	6	20	
MATRIX SPIKES											
Laboratory ID:	10-329-10										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**102**	**111**	100	100	2.64	**100**	**108**	75-125	8	20	
Zinc	**111**	**115**	100	100	5.94	**105**	**109**	75-125	3	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUMI-20181027**					
Laboratory ID:	10-346-01					
Copper	**2.3**	1.0	EPA 200.8		10-30-18	
Zinc	**37**	5.0	EPA 200.8		10-30-18	
Client ID:	**COUMO-20181027**					
Laboratory ID:	10-346-02					
Copper	**2.8**	1.0	EPA 200.8		10-30-18	
Zinc	**18**	5.0	EPA 200.8		10-30-18	
Client ID:	**EVAMS-20181027**					
Laboratory ID:	10-346-03					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**14**	5.0	EPA 200.8		10-30-18	
Client ID:	**EVALSS-20181027**					
Laboratory ID:	10-346-04					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**MONMN-20181027**					
Laboratory ID:	10-346-05					
Copper	**1.4**	1.0	EPA 200.8		10-30-18	
Zinc	**5.1**	5.0	EPA 200.8		10-30-18	
Client ID:	**MONMS-20181027**					
Laboratory ID:	10-346-06					
Copper	**1.7**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	
Client ID:	**MONM-20181027**					
Laboratory ID:	10-346-07					
Copper	**1.3**	1.0	EPA 200.8		10-30-18	
Zinc	**9.4**	5.0	EPA 200.8		10-30-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSMI-20181027**					
Laboratory ID:	10-346-08					
Copper	**2.2**	1.0	EPA 200.8		10-30-18	
Zinc	**15**	5.0	EPA 200.8		10-30-18	
Client ID:	**TOSMO-20181027**					
Laboratory ID:	10-346-09					
Copper	**2.4**	1.0	EPA 200.8		10-30-18	
Zinc	**8.1**	5.0	EPA 200.8		10-30-18	
Client ID:	**TYLMI-20181027**					
Laboratory ID:	10-346-10					
Copper	**4.3**	1.0	EPA 200.8		10-30-18	
Zinc	**5.2**	5.0	EPA 200.8		10-30-18	
Client ID:	**TYLMO-20181027**					
Laboratory ID:	10-346-11					
Copper	**3.6**	1.0	EPA 200.8		10-30-18	
Zinc	**5.6**	5.0	EPA 200.8		10-30-18	
Client ID:	**QA55-20181027**					
Laboratory ID:	10-346-12					
Copper	**2.6**	1.0	EPA 200.8		10-30-18	
Zinc	**10**	5.0	EPA 200.8		10-30-18	

Date of Report: November 13, 2018
Samples Submitted: October 27, 2018
Laboratory Reference: 1810-346
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1030D2					
Copper	**ND**	1.0	EPA 200.8		10-30-18	
Zinc	**ND**	5.0	EPA 200.8		10-30-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-346-12										
	ORIG	DUP									
Copper	**2.64**	**2.78**	NA	NA		NA		NA	5	20	
Zinc	**10.1**	**10.9**	NA	NA		NA		NA	8	20	
MATRIX SPIKES											
Laboratory ID:	10-346-12										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**76.2**	**74.2**	80.0	80.0	2.64	**92**	**90**	75-125	3	20	
Zinc	**89.2**	**90.8**	80.0	80.0	10.1	**99**	**101**	75-125	2	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 13 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMON PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COUMI-20181027	Water	18-A019640	Micro, NUT
COUMO-20181027	Water	18-A019641	Micro, NUT
EVAMS-20181027	Water	18-A019642	Micro, NUT
EVALSS-20181027	Water	18-A019643	Micro, NUT
MONMN-20181027	Water	18-A019644	Micro, NUT
MONMS-20181027	Water	18-A019645	Micro, NUT
MONM-20181027	Water	18-A019646	Micro, NUT
TOSMI-20181027	Water	18-A019647	Micro, NUT
TOSMO-20181027	Water	18-A019648	Micro, NUT
TYLMI-20181027	Water	18-A019649	Micro, NUT
TYLMO-20181027	Water	18-A019650	Micro, NUT
QA55-20181027	Water	18-A019651	Micro, NUT

Your samples were received on Monday, October 29, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

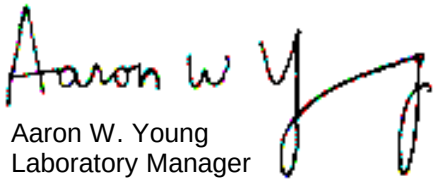
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 10-346

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMON PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 10-346
All results reported on an as received basis.

Date Received: 10/29/18
Date Reported: 11/13/18

AMTEST Identification Number **18-A019640**
Client Identification **COUMI-20181027**
Sampling Date **10/27/18, 20:20**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	4000	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.56	mg/l		0.1			
Total Nitrogen (TKN)	1.33	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.23	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019641**
Client Identification **COUMO-20181027**
Sampling Date **10/27/18, 20:05**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	5000	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.02	mg/l		0.1			
Total Nitrogen (TKN)	0.820	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.20	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019642**
Client Identification **EVAMS-20181027**
Sampling Date **10/27/18, 20:40**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	300	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	2.00	mg/l		0.1			
Total Nitrogen (TKN)	0.597	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	1.4	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019643**
Client Identification **EVALSS-20181027**
Sampling Date **10/27/18, 20:55**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	280	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.90	mg/l		0.1			
Total Nitrogen (TKN)	0.699	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	1.2	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019644**
Client Identification **MONMN-20181027**
Sampling Date **10/27/18, 22:20**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	840	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	2.48	mg/l		0.1			
Total Nitrogen (TKN)	2.20	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.28	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019645**
Client Identification **MONMS-20181027**
Sampling Date **10/27/18, 22:20**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	660	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.60	mg/l		0.1			
Total Nitrogen (TKN)	0.424	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.18	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019646**
Client Identification **MONM-20181027**
Sampling Date **10/27/18, 22:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	1500	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	2.21	mg/l		0.1			
Total Nitrogen (TKN)	1.90	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.31	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019647**
Client Identification **TOSMI-20181027**
Sampling Date **10/27/18, 20:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.90	mg/l		0.1			
Total Nitrogen (TKN)	0.746	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.15	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019648**
Client Identification **TOSMO-20181027**
Sampling Date **10/27/18, 20:45**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	1300	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	2.84	mg/l		0.1			
Total Nitrogen (TKN)	2.62	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.22	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019649**
Client Identification **TYLMI-20181027**
Sampling Date **10/27/18, 21:50**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	840	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.15	mg/l		0.1			
Total Nitrogen (TKN)	0.768	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.38	mg/l		0.01	EPA 353.2	JC	11/05/18

AMTEST Identification Number **18-A019650**
Client Identification **TYLMO-20181027**
Sampling Date **10/27/18, 21:20**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	1800	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.698	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.25	mg/l		0.01	EPA 353.2	JC	11/05/18

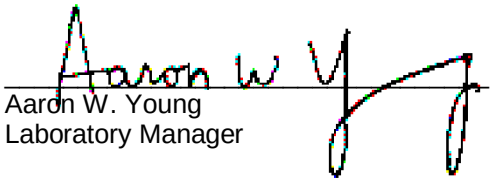
AMTEST Identification Number **18-A019651**
Client Identification **QA55-20181027**
Sampling Date **10/27/18, 21:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	1700	CFU/100 ml		1	SM 9222D	JM	10/29/18 16:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.70	mg/l		0.1			
Total Nitrogen (TKN)	1.49	mg/l		0.1	EPA 351.2	JC	11/08/18
Total Nitrate + Nitrite	0.21	mg/l		0.01	EPA 353.2	JC	11/05/18



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 18-A019640 to 18-A019651

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A019643	Fecal coliform	CFU/100 ml	280	180	43.
18-A019648	Fecal coliform	CFU/100 ml	1300	1000	26.
18-A019643	Total Nitrogen (TKN)	mg/l	0.699	0.710	1.6
18-A019657	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019917	Total Nitrogen (TKN)	mg/l	0.296	0.279	5.9
18-A019966	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019593	Total Nitrate + Nitrite	mg/l	0.095	0.095	0.00
18-A019649	Total Nitrate + Nitrite	mg/l	0.38	0.32	17.
18-A019808	Total Nitrate + Nitrite	mg/l	0.15	0.17	12.
18-A019811	Total Nitrate + Nitrite	mg/l	0.53	0.50	5.8
18-A019923	Total Nitrate + Nitrite	mg/l	0.15	0.15	0.00

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A019643	Total Nitrogen (TKN)	mg/l	0.699	1.52	1.00	82.10 %
18-A019657	Total Nitrogen (TKN)	mg/l	< 0.1	0.855	1.00	85.50 %
18-A019917	Total Nitrogen (TKN)	mg/l	0.296	1.13	1.00	83.40 %
18-A019966	Total Nitrogen (TKN)	mg/l	< 0.1	0.870	1.00	87.00 %
18-A019593	Total Nitrate + Nitrite	mg/l	0.095	1.2	1.0	110.50 %
18-A019649	Total Nitrate + Nitrite	mg/l	0.38	1.2	1.0	82.00 %
18-A019808	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %
18-A019811	Total Nitrate + Nitrite	mg/l	0.53	1.5	1.0	97.00 %
18-A019923	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.960	96.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.953	95.3 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1

QC Summary for sample numbers: 18-A019640 to 18-A019651...

BLANKS continued....

ANALYTE	UNITS	RESULT
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	0.014
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	0.013

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-346

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COUMI-20181027 19640	10/27/18	20:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMO-20181027 41	10/27/18	20:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	EVAMS-20181027 42	10/27/18	20:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVALSS-20181027 43	10/27/18	20:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	MONMN-20181027 44	10/27/18	22:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMS-20181027 45	10/27/18	22:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONM-20181027 46	10/27/18	22:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	TOSMI-20181027 47	10/27/18	20:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	TOSMO-20181027 48	10/27/18	20:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	TYLMI-20181027 49	10/27/18	21:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:			10/29/18	845	
Received by:		AMTEST T= 7.4	10/29/18	8:45	**EDDs - CSV**
Relinquished by:					**Reporting Limits:**
Received by:					**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:					**Total Nitrogen - .10 mg/L**
Received by:					

CLIENT

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-346

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TYLMO-20181027 19650	10/27/18	21:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	QA55-20181027 51	10/27/18	21:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time
Relinquished by:			
Received by:			
Relinquished by:			
Received by:			
Relinquished by:			
Received by:			

Comments/Special Instructions

EDDs - CSV

Reporting Limits:

Fecal Coliform - 1.0 cfu/100ml

Total Nitrogen - .10 mg/L

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No. 10-346

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
~~—~~	~~COLM-2018~~	~~[illegible]~~		Water	7	X	X	X	X	X	X	X	X	X			
1	COUMI-2018 1027	10/27/18	2020	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMO-2018 1027	10/27/18	2005	Water	7	X	X	X	X	X	X	X	X	X			
3	EVAMS-2018 1027	10/27/18	2040	Water	7	X	X	X	X	X	X	X	X	X			
4	EVALSS-2018 1027	10/27/18	2055	Water	7	X	X	X	X	X	X	X	X	X			
5	MONMN-2018 1027	10/27/18	2220	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMS-2018 1027	10/27/18	2220	Water	7	X	X	X	X	X	X	X	X	X			
7	MONM-2018 1027	10/27/18	2200	Water	7	X	X	X	X	X	X	X	X	X			
~~—~~	~~SEIMN-2018~~			Water	7	X	X	X	X	X	X	X	X	X			
~~—~~	~~SEIMS-2018~~			Water	7	X	X	X	X	X	X	X	X	X			
8	TOSMI-2018 1027	10/27/18	2060	Water	7	X	X	X	X	X	X	X	X	X			
9	TOSMO-2018 1027	10/27/18	2045	Water	7	X	X	X	X	X	X	X	X	X			
10	TYLMI-2018 1027	10/27/18	2150	Water	7	X	X	X	X	X	X	X	X	X			
11	TYLMO-2018 1027	10/27/18	2120	Water	7	X	X	X	X	X	X	X	X	X			
12	~~QA55-2018~~ QA55-20181027	10/27/18	2100	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Valerie Wu Date 10/27/18 Received by _____ Date 10/27/18

Firm Herrera Time 23:01 Firm _____ Time 23011

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No. 10-346

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
~~—~~	~~COLM-2018~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
1	COUMI-2018 1027	10/27/18	2020	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMO-2018 1027	10/27/18	2005	Water	7	X	X	X	X	X	X	X	X	X			
3	EVAMS-2018 1027	10/27/18	2040	Water	7	X	X	X	X	X	X	X	X	X			
4	EVALSS-2018 1027	10/27/18	2055	Water	7	X	X	X	X	X	X	X	X	X			
5	MONMN-2018 1027	10/27/18	2220	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMS-2018 1027	10/27/18	2220	Water	7	X	X	X	X	X	X	X	X	X			
7	MONM-2018 1027	10/27/18	2200	Water	7	X	X	X	X	X	X	X	X	X			
~~—~~	~~SEIMN-2018~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
~~—~~	~~SEIMS-2018~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
8	TOSMI-2018 1027	10/27/18	2060	Water	7	X	X	X	X	X	X	X	X	X			
9	TOSMO-2018 1027	10/27/18	2045	Water	7	X	X	X	X	X	X	X	X	X			
10	TYLMI-2018 1027	10/27/18	2150	Water	7	X	X	X	X	X	X	X	X	X			
11	TYLMO-2018 1027	10/27/18	2120	Water	7	X	X	X	X	X	X	X	X	X			
12	[redacted] QA55-20181027	10/27/18	2100	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Valerie Wu Date 10/27 Received by [signature] Date 10/27/18
Firm Herrera Time 23:01 Firm [illegible] Time 23011

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Gretchen Kayser
Meter:	YSI ProDSS #1
Date/Time:	10/27/18 19:00
Barometric Pressure Start of Day:	mmHg: 753.9 Time: 19:00
Barometric Pressure End of Day:	mmHg: 763.6 Time: 10/29/18 14:40

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.2	0	13.7	
Conductivity (µS/cm)	979	1,000	13.8	Post Cal #1000
Conductivity (µS/cm)	101.4	100	13.9	
DO % Saturation	98.5	100	13.6	wouldn't let me change cal. value #99.1

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.4 [redacted]	0	23.1	Herrera DI
Conductivity (µS/cm)	101.0	100	21.9	
DO % Saturation	100.0	100	22.4	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Gretchen Kvistad
Meter:	YSI ProDSS #2
Date/Time:	10/27/18 19:00
Barometric Pressure Start of Day:	mmHg: 753.5 Time: 19:00
Barometric Pressure End of Day:	mmHg: 763.8 Time: 10/29/18 14:40

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.8	0	14.5	
Conductivity (µS/cm)	944	1,000	14.3	Post Cal #1000
Conductivity (µS/cm)	99.5	100	13.5	
DO % Saturation	100.2	100	13.4	Post Cal #100.0

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.1	0	24.1	Herrera DI
Conductivity (µS/cm)	102.3	100	22.2	
DO % Saturation	101.1	100	22.7	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B Bland

Sample Date: 10.23.18 **Sample Time:** 2020 PDT: X PST:

Base Flow or Storm Event? **Field Filtered Time:** 2025 (Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 53°F

Water Quality Sampling

Sample ID: COUM1-20181023

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	✓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	cloudy
Color:	dark gray
Odor:	none
Sheen:	
Floatables:	sus'p sed, org deb

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Z. Lentz **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.83

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.5

Specific Conductivity (µs/cm) 90.0

Dissolved Oxygen (mg/L) 10.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B.Bland

Sample Date: 10-25-18 **Sample Time:** 2005 PDT: X PST:

Base Flow or Storm Event? **Field Filtered Time:** 2010 (Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain, 53°

Water Quality Sampling

Sample ID: COUMO-20181025-7

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	D
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	dark gray
Odor:	none
Sheen:	
Floatables:	susp sed, org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lenth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.62

Reference Point (description): EG

Water Quality Measurments

Temperature (°C) 12.2

Specific Conductivity (µs/cm) 59.0

Dissolved Oxygen (mg/L) 10.8

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: VW + GK

Sample Date: 10/27/18 **Sample Time:** 20:40 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 20:45 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 54°F

Water Quality Sampling

Sample ID: EVAMS-20181027

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	slightly turbid
Color:	light brown/yellow
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Lentz **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS II
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.92

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.3

Specific Conductivity (µs/cm) 194.3

Dissolved Oxygen (mg/L) 10.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: VW + GK

Sample Date: 10/27/18 **Sample Time:** 20:55 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 21:00 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 52°

Water Quality Sampling

Sample ID: EVALSS-20181027

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear / clear

Color: clear

Odor: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lentz **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.38

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.3

Specific Conductivity (µs/cm) 179.6

Dissolved Oxygen (mg/L) 10.99

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: VW + GK

Sample Date: 10/27/18 **Sample Time:** 22:20 PDT: X PST:

Base Flow or Storm Event?

Field Filtered Time: 22:25 (Must filter within 15 minutes of collection)

SITE ID: MoNMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 54 + Rainy

Water Quality Sampling

Sample ID: MoNMN20181027

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: ~~Slightly~~ v. turbid

Color: brown/tan

Odor: N/A

Sheen: N/A

Floatables: Nil

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Smith **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.35 → assume 10.55 (MM) ↓ may be 9.35

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 16.7

Specific Conductivity (µs/cm) 134.1

Dissolved Oxygen (mg/L) 10.22

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B Bland

Sample Date: 10.25.18 | Sample Time: 2220 | PDT: X | PST:

Base Flow or Storm Event? | Field Filtered Time: 2225 (Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain, 53°F

Water Quality Sampling

Sample ID: MONMS-20181027

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: slight sulfur

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: T. Lentsch Signature:

Date Checked: 11-21-18 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.43

Reference Point (description): vault

Water Quality Measurments

Temperature (°C) 11.3

Specific Conductivity (µs/cm) 164.6

Dissolved Oxygen (mg/L) 8.09

the area had a sewer/sulfur/septic smell

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: VW + GK

Sample Date: 10/27/18 **Sample Time:** 22:00 PDT: X PST:

Base Flow or Storm Event? **Field Filtered Time:** 22:05
(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 54°

Water Quality Sampling

Sample ID: MONM

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	V. turbid
Color:	brownish
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lemith **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 10.9

Specific Conductivity (µs/cm) 166.7

Dissolved Oxygen (mg/L) 10.83

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: VW + GK

Sample Date: 10/27/18 Sample Time: 20:00 PDT: X PST:

Base Flow or Storm Event?

Field Filtered Time: 20:05 (Must filter within 15 minutes of collection)

SITE ID: TOSM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Rainy + 54°

Water Quality Sampling

Sample ID: TOSM1-20181027

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: ~~Clear~~ filters clogged/turbid

Color: brownish/gray

Odor: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: T. Lentz Signature:

Date Checked: 11-21-18 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.06

Reference Point (description): S.G.

Water Quality Measurments

Temperature (°C) 12.0

Specific Conductivity (µs/cm) 40.5

Dissolved Oxygen (mg/L) 10.63

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B Bland

Sample Date: 10-25-18 **Sample Time:** 2045 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 2050 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain, 53°F

Water Quality Sampling

Sample ID: TOSMO-20181025

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	YES
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QASS-20181025TO 2100

Filter blank sample ID: NA

Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: cloudy

Color: dark brown

Odor: none

Sheen: none

Floatables: foam, susp sed, org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.01

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.9

Specific Conductivity (µs/cm) 75.2

Dissolved Oxygen (mg/L) 10.63

A lot of foam under weir. See photo

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B Bland

Sample Date: 10/25/18 **Sample Time:** 2150 PDT: X

Base Flow or Storm Event? PST:

Field Filtered Time: 2155 (Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 53°F

Water Quality Sampling

Sample ID: TYLM1-20181025 7

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: light gray

Odor: none

Sheen: none

Floatables: susp sed, org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lauth **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.37

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 12.0

Specific Conductivity (µs/cm) 68.4

Dissolved Oxygen (mg/L) 9.89

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B Bland

Sample Date: 10.28.18 **Sample Time:** 2120 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 2125 PST:
(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain, 53°F

Water Quality Sampling

Sample ID: TYLMO-20181028-1

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: light gray

Odor: none

Sheen:

Floatables: org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Leath **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.41

Reference Point (description): top of culvert L

Water Quality Measurments

Temperature (°C) 11.8

Specific Conductivity (µs/cm) 58.8

Dissolved Oxygen (mg/L) 10.38

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/18/2018 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/27/2018 / All locations, except as noted, QA55 (TOSMO); COLM, SEIMN, SEIMS collected 11/01/2018

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	3,4	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	95, 105	**±20**	2, 6	**≤ 25**	56	**≤ 25**	OK	J TOSMO DUE TO FD RPD
Turbidity	OK / EPA 180.1	NA	**NA**	2, <1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	2, 1	**≤ 25**	40	**≤ 25**	OK	J TOSMO DUE TO FD RPD
Hardness	OK / SM 2340B	NA	**NA**	5, 8	**≤180**	≤1.0 mg/L 1.0 mg/L	107-121	**±25**	105, 106	**±15**	3, 1	**≤ 20**	20	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	10, 5	**≤28**	≤1.0 mg/L 1.0 mg/L	98	**±25**	99	**±15**	2	**≤ 20**	3.6	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6, 1	**≤28**	≤0.01 mg/L 0.01 mg/L	98, 91	**±25**	92, 94	**±20**	2, 4	**≤ 20**	51	**≤ 20**	OK	J TOSMO DUE TO FD RPD
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	12,9 7, 4	**≤28**	≤0.1 mg/L 0.1 mg/L	82-86 82	**±25**	95-100	**±20**	1.6, NC 17	**≤ 20**	55 4.9	**≤ 20**	OK	J TOSMO FOR TKN DUE TO FD RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/18/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/27/2018 / All locations, except as noted, QA55 (TOSMO); COLM, SEIMN, SEIMS collected 11/01/2018

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤1.0 µg/L 1.0 µg/L	100-108	**±25**	NR	**±15**	2, NC	**≤ 20**	20	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	105-119	**±25**	NR	**±15**	6, NC	**≤ 20**	11	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	3, 7	**≤180**	≤1.0 µg/L 1.0 µg/L	88-92	**±25**	NR	**±15**	5, NC	**≤ 20**	8	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	3, 7	**≤180**	≤5.0 µg/L 5.0 µg/L	95-101	**±25**	NR	**±15**	8, NC	**≤ 20**	D=1.9	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	2, <1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	43, 26	**≤ 35**	27	**≤ 50**	OK	J 10/27 DUE TO HOLDING TIME. J EVALSS DUE TO LAB DUP RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 13, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1811-006

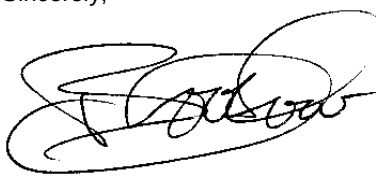
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on November 1, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

Case Narrative

Samples were collected on November 1, 2018 and received by the laboratory on November 1, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181101**					
Laboratory ID:	11-006-01					
Total Suspended Solids	**1.0**	1.0	SM 2540D	11-2-18	11-5-18	
Client ID:	**SEIMN-20181101**					
Laboratory ID:	11-006-02					
Total Suspended Solids	**40**	1.0	SM 2540D	11-2-18	11-5-18	
Client ID:	**SEIMS-20181101**					
Laboratory ID:	11-006-03					
Total Suspended Solids	**7.4**	1.0	SM 2540D	11-2-18	11-5-18	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	11-2-18	11-5-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-006-03								
	ORIG	DUP							
Total Suspended Solids	**7.40**	**7.00**	NA	NA	NA	NA	6	22	
SPIKE BLANK									
Laboratory ID:	SB1102W1								
	SB		SB		SB				
Total Suspended Solids	**105**		100	NA	105	76-114	NA	NA	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181101**					
Laboratory ID:	11-006-01					
Turbidity	**1.2**	0.10	EPA 180.1	11-1-18	11-1-18	
Client ID:	**SEIMN-20181101**					
Laboratory ID:	11-006-02					
Turbidity	**20**	0.10	EPA 180.1	11-1-18	11-1-18	
Client ID:	**SEIMS-20181101**					
Laboratory ID:	11-006-03					
Turbidity	**3.9**	0.10	EPA 180.1	11-1-18	11-1-18	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W1					
Turbidity	**ND**	0.10	EPA 180.1	11-1-18	11-1-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-006-01								
	ORIG	DUP							
Turbidity	**1.15**	**1.16**	NA	NA	NA	NA	1	15	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181101**					
Laboratory ID:	11-006-01					
Hardness	**12**	1.0	200.7/SM 2340B	11-2-18	11-9-18	
Client ID:	**SEIMN-20181101**					
Laboratory ID:	11-006-02					
Hardness	**40**	1.0	200.7/SM 2340B	11-2-18	11-9-18	
Client ID:	**SEIMS-20181101**					
Laboratory ID:	11-006-03					
Hardness	**50**	1.0	200.7/SM 2340B	11-2-18	11-9-18	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	11-2-18	11-9-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-006-01										
	ORIG	DUP									
Hardness	**12.2**	**12.1**	NA		NA	NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	11-006-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**157**	**153**	132	132	12.2	110	107	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB1102WH1										
	SB		SB			SB					
Hardness	**140**		132		NA	106		80-120	NA	NA	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181101**					
Laboratory ID:	11-006-01					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**SEIMN-20181101**					
Laboratory ID:	11-006-02					
Dissolved Organic Carbon	**6.3**	1.0	SM 5310B	11-6-18	11-6-18	
Client ID:	**SEIMS-20181101**					
Laboratory ID:	11-006-03					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	11-6-18	11-6-18	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1106D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	11-6-18	11-6-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-006-03								
	ORIG	DUP							
Dissolved Organic Carbon	**10.9**	**11.1**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	11-006-03								
	MS		MS		MS				
Dissolved Organic Carbon	**20.7**		10.0	10.9	98	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1106D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.86**		10.0	NA	99	80-120	NA	NA	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181101**					
Laboratory ID:	11-006-01					
Total Phosphorus	**0.018**	0.010	EPA 365.1	11-2-18	11-2-18	
Client ID:	**SEIMN-20181101**					
Laboratory ID:	11-006-02					
Total Phosphorus	**0.12**	0.010	EPA 365.1	11-2-18	11-2-18	
Client ID:	**SEIMS-20181101**					
Laboratory ID:	11-006-03					
Total Phosphorus	**0.044**	0.010	EPA 365.1	11-2-18	11-2-18	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	11-2-18	11-2-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-006-01								
	ORIG	DUP							
Total Phosphorus	**0.0177**	**0.0170**	NA	NA	NA	NA	4	12	
MATRIX SPIKE									
Laboratory ID:	11-006-01								
	MS		MS		MS				
Total Phosphorus	**0.245**		0.250	0.0177	91	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1102W1								
	SB		SB		SB				
Total Phosphorus	**0.236**		0.250	NA	94	83-114	NA	NA	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181101**					
Laboratory ID:	11-006-01					
Copper	**ND**	1.0	EPA 200.8	11-2-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	11-2-18	11-5-18	
Client ID:	**SEIMN-20181101**					
Laboratory ID:	11-006-02					
Copper	**1.7**	1.0	EPA 200.8	11-2-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	11-2-18	11-5-18	
Client ID:	**SEIMS-20181101**					
Laboratory ID:	11-006-03					
Copper	**ND**	1.0	EPA 200.8	11-2-18	11-5-18	
Zinc	**ND**	5.0	EPA 200.8	11-2-18	11-5-18	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102WH2					
Copper	**ND**	1.0	EPA 200.8	11-2-18	11-2-18	
Zinc	**ND**	5.0	EPA 200.8	11-2-18	11-2-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-383-01										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**5.04**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-383-01										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**106**	**105**	100	100	ND	**106**	**105**	75-125	1	20	
Zinc	**114**	**115**	100	100	ND	**114**	**115**	75-125	1	20	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181101**					
Laboratory ID:	11-006-01					
Copper	**ND**	1.0	EPA 200.8		11-8-18	
Zinc	**ND**	5.0	EPA 200.8		11-8-18	
Client ID:	**SEIMN-20181101**					
Laboratory ID:	11-006-02					
Copper	**ND**	1.0	EPA 200.8		11-8-18	
Zinc	**ND**	5.0	EPA 200.8		11-8-18	
Client ID:	**SEIMS-20181101**					
Laboratory ID:	11-006-03					
Copper	**ND**	1.0	EPA 200.8		11-8-18	
Zinc	**ND**	5.0	EPA 200.8		11-8-18	

Date of Report: November 13, 2018
Samples Submitted: November 1, 2018
Laboratory Reference: 1811-006
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1108D1					
Copper	**ND**	1.0	EPA 200.8		11-8-18	
Zinc	**ND**	5.0	EPA 200.8		11-8-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-006-03										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	11-006-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**70.6**	**71.8**	80.0	80.0	ND	**88**	**90**	75-125	2	20	
Zinc	**76.2**	**80.6**	80.0	80.0	ND	**95**	**101**	75-125	6	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 13 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181101	Water	18-A019865	Micro, NUT
SEIMN-20181101	Water	18-A019866	Micro, NUT
SEIMS-20181101	Water	18-A019867	Micro, NUT

Your samples were received on Thursday, November 1, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 11-006

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 11-006
All results reported on an as received basis.

Date Received: 11/01/18
Date Reported: 11/13/18

AMTEST Identification Number **18-A019865**
Client Identification **COLM-20181101**
Sampling Date **11/01/18, 12:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	40.	CFU/100 ml		1	SM 9222D	JM	11/01/18
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.440	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.061	mg/l		0.01	SM4500NO3	JC	11/05/18

AMTEST Identification Number **18-A019866**
Client Identification **SEIMN-20181101**
Sampling Date **11/01/18, 11:00**

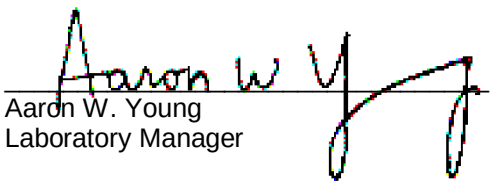
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	340	CFU/100 ml		1	SM 9222D	JM	11/01/18
Total Nitrogen (NOX&TKN)	0.89	mg/l		0.1			
Total Nitrogen (TKN)	0.403	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.49	mg/l		0.01	SM4500NO3	JC	11/05/18

AMTEST Identification Number **18-A019867**
Client Identification **SEIMS-20181101**
Sampling Date **11/01/18, 13:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	29.	CFU/100 ml		1	SM 9222D	JM	11/01/18
Total Nitrogen (NOX&TKN)	0.57	mg/l		0.1			
Total Nitrogen (TKN)	0.306	mg/l		0.1	SM4500N	JC	11/08/18
Total Nitrate + Nitrite	0.26	mg/l		0.01	SM4500NO3	JC	11/05/18



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 18-A019865 to 18-A019867

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A019860	Fecal coliform	CFU/100 ml	62.	60.	3.3
18-A019643	Total Nitrogen (TKN)	mg/l	0.699	0.710	1.6
18-A019657	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019917	Total Nitrogen (TKN)	mg/l	0.296	0.279	5.9
18-A019966	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A019593	Total Nitrate + Nitrite	mg/l	0.095	0.095	0.00
18-A019649	Total Nitrate + Nitrite	mg/l	0.38	0.32	17.
18-A019808	Total Nitrate + Nitrite	mg/l	0.15	0.17	12.
18-A019811	Total Nitrate + Nitrite	mg/l	0.53	0.50	5.8
18-A019923	Total Nitrate + Nitrite	mg/l	0.15	0.15	0.00

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A019643	Total Nitrogen (TKN)	mg/l	0.699	1.52	1.00	82.10 %
18-A019657	Total Nitrogen (TKN)	mg/l	< 0.1	0.855	1.00	85.50 %
18-A019917	Total Nitrogen (TKN)	mg/l	0.296	1.13	1.00	83.40 %
18-A019966	Total Nitrogen (TKN)	mg/l	< 0.1	0.870	1.00	87.00 %
18-A019593	Total Nitrate + Nitrite	mg/l	0.095	1.2	1.0	110.50 %
18-A019649	Total Nitrate + Nitrite	mg/l	0.38	1.2	1.0	82.00 %
18-A019808	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %
18-A019811	Total Nitrate + Nitrite	mg/l	0.53	1.5	1.0	97.00 %
18-A019923	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.960	96.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.953	95.3 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01

QC Summary for sample numbers: 18-A019865 to 18-A019867...

BLANKS continued....

ANALYTE	UNITS	RESULT
Total Nitrate + Nitrite	mg/l	0.014
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	0.013

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 11-006

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20181101 19865	11/1/18	12:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	SEIMN-20181101 66	11/1/18	11:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	SEIMS-20181101 67	11/1/18	13:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	11/1/18	3:45p	
Received by:	Amtest	11/1/18	15:45	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

F8.2

~~Courier~~ client

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 11-006

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1101	11.1.18	12:00	Water	7	X	X	X	X	X	X	X	X	X			
~~2~~	COUMI-2018 ~~1101~~			Water	7	X	X	X	X	X	X	X	X	X			
~~3~~	COUMO-2018 ~~1101~~			Water	7	X	X	X	X	X	X	X	X	X			
~~4~~	EVAMS-2018 ~~1~~			Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2018			Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2018			Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2018			Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2018			Water	7	X	X	X	X	X	X	X	X	X			
2	SEIMN-2018 1101	11.1.18	11:00	Water	7	X	X	X	X	X	X	X	X	X			
3	SEIMS-2018 1101	11.1.18	13:10	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2018			Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2018			Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2018			Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2018			Water	7	X	X	X	X	X	X	X	X	X			
	QA			Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 11.1.18 Received by [illegible] Date 11/1/18

Firm Herrera Environmental Time 13:35 Firm OSE Time 1335

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

Page 1 of 1

OnSite Environmental Inc.

4648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iltner

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

__X__ Standard

Laboratory No. 11-006

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1101	11.1.18	12:00	Water	7	X	X	X	X	X	X	X	X	X			
~~2~~	COUMI-2018 ~~1101~~	"	"	Water	7	X	X	X	X	X	X	X	X	X			
~~3~~	COUMO-2018 ~~1101~~	"	"	Water	7	X	X	X	X	X	X	X	X	X			
~~4~~	EVAMS-2018 1	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
2	SEIMN-2018 1101	11.1.18	11:00	Water	7	X	X	X	X	X	X	X	X	X			
3	SEIMS-2018 1101	11.1.18	13:10	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2018	"	"	Water	7	X	X	X	X	X	X	X	X	X			
	QA	"	"	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 11.1.18 Received by [illegible] Date 11/1/18

Firm Herrera Environmental Time 13:35 Firm OSE Time 1335

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller K Blesr
Meter:	Pro° DSS # 2
Date/Time:	11/1/18 10:00
Barometric Pressure Start of Day:	mmHg: 760.8 Time: 10:00
Barometric Pressure End of Day:	mmHg: 761.2 Time: 14:15

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.0	0	24.3	Herrera DI water
Conductivity (µS/cm)	1031	1,000	24.3	Calibrated→ new: 1000
Conductivity (µS/cm)	100.6	100	24.0	
DO % Saturation	~~99.0~~ 101.1	100	~~24.7~~	calibrated new: 100.1

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.2	0	23.8	
Conductivity (µS/cm)	101.1	100	24.2	
DO % Saturation	100.5	100	23.6	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mullen K. Bliss

Sample Date: 11/1/18 **Sample Time:** 12:00 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 12:05 PST:

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 54°

Water Quality Sampling

Sample ID: COLM-20181101

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NA
Filter blank sample ID:	NA
Transfer blank sample ID:	NA

Visual and Olfactory Conditions:

Clarity:	clear
Color:	tannin
Odor:	none
Sheen:	none
Floatables:	leaves

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lewis **Signature:**

Date Checked: 11-29-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.50

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 40.3

Dissolved Oxygen (mg/L) ~~10~~ 8.73

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen K Bliss

Sample Date: 11/1/18 Sample Time: 11:00 PDT: X

Base Flow or Storm Event? Field Filtered Time: 11:05 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 58°

Water Quality Sampling

Sample ID: SEIMN-20181101

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: NA

Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: fallen leaves

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: J. Louth Signature:

Date Checked: 11-21-18 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.71

Reference Point (description): top of bolt down

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 93.7

Dissolved Oxygen (mg/L) 10.74

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller K Bliss

Sample Date: 11.1.18 **Sample Time:** 13:10 PDT: X

Base Flow or Storm Event? (B) **Field Filtered Time:** 13:15 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 58°

Water Quality Sampling

Sample ID: SEIMS-20181101

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	NO
Transfer blank sample ID:	NO

Visual and Olfactory Conditions:

Clarity:	clear
Color:	tannin
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Lautz **Signature:**

Date Checked: 11-21-18 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.80

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.2

Specific Conductivity (µs/cm) 113.8

Dissolved Oxygen (mg/L) 9.48

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/18/2018 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/27/2018 / All locations, except as noted, QA55 (TOSMO); COLM, SEIMN, SEIMS collected 11/01/2018

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	3,4	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	95, 105	**±20**	2, 6	**≤ 25**	56	**≤ 25**	OK	J TOSMO DUE TO FD RPD
Turbidity	OK / EPA 180.1	NA	**NA**	2, <1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	2, 1	**≤ 25**	40	**≤ 25**	OK	J TOSMO DUE TO FD RPD
Hardness	OK / SM 2340B	NA	**NA**	5, 8	**≤180**	≤1.0 mg/L 1.0 mg/L	107-121	**±25**	105, 106	**±15**	3, 1	**≤ 20**	20	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	10, 5	**≤28**	≤1.0 mg/L 1.0 mg/L	98	**±25**	99	**±15**	2	**≤ 20**	3.6	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6, 1	**≤28**	≤0.01 mg/L 0.01 mg/L	98, 91	**±25**	92, 94	**±20**	2, 4	**≤ 20**	51	**≤ 20**	OK	J TOSMO DUE TO FD RPD
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	12,9 7, 4	**≤28**	≤0.1 mg/L 0.1 mg/L	82-86 82	**±25**	95-100	**±20**	1.6, NC 17	**≤ 20**	55 4.9	**≤ 20**	OK	J TOSMO FOR TKN DUE TO FD RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/18/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/27/2018 / All locations, except as noted, QA55 (TOSMO); COLM, SEIMN, SEIMS collected 11/01/2018

date 11/21/2018

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤1.0 µg/L 1.0 µg/L	100-108	**±25**	NR	**±15**	2, NC	**≤ 20**	20	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	105-119	**±25**	NR	**±15**	6, NC	**≤ 20**	11	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	3, 7	**≤180**	≤1.0 µg/L 1.0 µg/L	88-92	**±25**	NR	**±15**	5, NC	**≤ 20**	8	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	3, 7	**≤180**	≤5.0 µg/L 5.0 µg/L	95-101	**±25**	NR	**±15**	8, NC	**≤ 20**	D=1.9	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	2, <1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	43, 26	**≤ 35**	27	**≤ 50**	OK	J 10/27 DUE TO HOLDING TIME. J EVALSS DUE TO LAB DUP RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

December 13, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1811-213

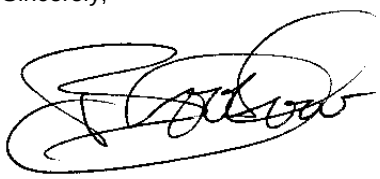
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on November 27, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

Case Narrative

Samples were collected on November 26, 2018 and received by the laboratory on November 27, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181126**					
Laboratory ID:	11-213-01					
Total Suspended Solids	**3.8**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**COUMI-20181126**					
Laboratory ID:	11-213-02					
Total Suspended Solids	**49**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**COUMO-20181126**					
Laboratory ID:	11-213-03					
Total Suspended Solids	**19**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**EVAMS-20181126**					
Laboratory ID:	11-213-04					
Total Suspended Solids	**5.8**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**EVALSS-20181126**					
Laboratory ID:	11-213-05					
Total Suspended Solids	**25**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**MONMN-20181126**					
Laboratory ID:	11-213-06					
Total Suspended Solids	**32**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**MONMS-20181126**					
Laboratory ID:	11-213-07					
Total Suspended Solids	**5.4**	1.0	SM 2540D	11-27-18	11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181126**					
Laboratory ID:	11-213-08					
Total Suspended Solids	**43**	1.7	SM 2540D	11-27-18	11-28-18	
Client ID:	**SEIMN-20181126**					
Laboratory ID:	11-213-09					
Total Suspended Solids	**120**	2.5	SM 2540D	11-27-18	11-28-18	
Client ID:	**SEIMS-20181126**					
Laboratory ID:	11-213-10					
Total Suspended Solids	**14**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**TOSMI-20181126**					
Laboratory ID:	11-213-11					
Total Suspended Solids	**87**	1.7	SM 2540D	11-27-18	11-28-18	
Client ID:	**TOSMO-20181126**					
Laboratory ID:	11-213-12					
Total Suspended Solids	**110**	2.5	SM 2540D	11-27-18	11-28-18	
Client ID:	**TYLMI-20181126**					
Laboratory ID:	11-213-13					
Total Suspended Solids	**17**	1.0	SM 2540D	11-27-18	11-28-18	
Client ID:	**TYLMO-20181126**					
Laboratory ID:	11-213-14					
Total Suspended Solids	**46**	1.0	SM 2540D	11-27-18	11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA56-20181126**					
Laboratory ID:	11-213-15					
Total Suspended Solids	**130**	2.5	SM 2540D	11-27-18	11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1127W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	11-27-18	11-28-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-213-15								
	ORIG	DUP							
Total Suspended Solids	**133**	**166**	NA	NA	NA	NA	22	22	
SPIKE BLANK									
Laboratory ID:	SB1127W2								
	SB		SB		SB				
Total Suspended Solids	**95.0**		100	NA	95	76-114	NA	NA	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181126**					
Laboratory ID:	11-213-01					
Turbidity	**1.5**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**COUMI-20181126**					
Laboratory ID:	11-213-02					
Turbidity	**28**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**COUMO-20181126**					
Laboratory ID:	11-213-03					
Turbidity	**12**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**EVAMS-20181126**					
Laboratory ID:	11-213-04					
Turbidity	**3.0**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**EVALSS-20181126**					
Laboratory ID:	11-213-05					
Turbidity	**6.2**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**MONMN-20181126**					
Laboratory ID:	11-213-06					
Turbidity	**18**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**MONMS-20181126**					
Laboratory ID:	11-213-07					
Turbidity	**4.4**	0.10	EPA 180.1	11-27-18	11-27-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181126**					
Laboratory ID:	11-213-08					
Turbidity	**24**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**SEIMN-20181126**					
Laboratory ID:	11-213-09					
Turbidity	**62**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**SEIMS-20181126**					
Laboratory ID:	11-213-10					
Turbidity	**5.0**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**TOSMI-20181126**					
Laboratory ID:	11-213-11					
Turbidity	**22**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**TOSMO-20181126**					
Laboratory ID:	11-213-12					
Turbidity	**38**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**TYLMI-20181126**					
Laboratory ID:	11-213-13					
Turbidity	**10**	0.10	EPA 180.1	11-27-18	11-27-18	
Client ID:	**TYLMO-20181126**					
Laboratory ID:	11-213-14					
Turbidity	**19**	0.10	EPA 180.1	11-27-18	11-27-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA56-20181126**					
Laboratory ID:	11-213-15					
Turbidity	**29**	0.10	EPA 180.1	11-27-18	11-27-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1127W1					
Turbidity	**ND**	0.10	EPA 180.1	11-27-18	11-27-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-207-01								
	ORIG	DUP							
Turbidity	**20.2**	**19.3**	NA	NA	NA	NA	5	15	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181126**					
Laboratory ID:	11-213-01					
Hardness	**12**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**COUMI-20181126**					
Laboratory ID:	11-213-02					
Hardness	**61**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**COUMO-20181126**					
Laboratory ID:	11-213-03					
Hardness	**46**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**EVAMS-20181126**					
Laboratory ID:	11-213-04					
Hardness	**72**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**EVALSS-20181126**					
Laboratory ID:	11-213-05					
Hardness	**72**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**MONMN-20181126**					
Laboratory ID:	11-213-06					
Hardness	**42**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**MONMS-20181126**					
Laboratory ID:	11-213-07					
Hardness	**65**	1.0	200.7/SM 2340B	12-4-18	12-4-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181126**					
Laboratory ID:	11-213-08					
Hardness	**51**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**SEIMN-20181126**					
Laboratory ID:	11-213-09					
Hardness	**31**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**SEIMS-20181126**					
Laboratory ID:	11-213-10					
Hardness	**41**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**TOSMI-20181126**					
Laboratory ID:	11-213-11					
Hardness	**31**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**TOSMO-20181126**					
Laboratory ID:	11-213-12					
Hardness	**51**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**TYLMI-20181126**					
Laboratory ID:	11-213-13					
Hardness	**37**	1.0	200.7/SM 2340B	12-4-18	12-4-18	
Client ID:	**TYLMO-20181126**					
Laboratory ID:	11-213-14					
Hardness	**35**	1.0	200.7/SM 2340B	12-4-18	12-4-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA56-20181126**					
Laboratory ID:	11-213-15					
Hardness	**24**	1.0	200.7/SM 2340B	12-4-18	12-4-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1204WH2					
Hardness	**ND**	1.0	200.7/SM 2340B	12-4-18	12-4-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-213-01										
	ORIG	DUP									
Hardness	**12.2**	**11.9**	NA		NA	NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	11-213-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**154**	**153**	132	132	12.2	107	107	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB1204WH2										
	SB		SB			SB					
Hardness	**137**		132		NA	104		80-120	NA	NA	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181126**					
Laboratory ID:	11-213-01					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**COUMI-20181126**					
Laboratory ID:	11-213-02					
Dissolved Organic Carbon	**6.8**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**COUMO-20181126**					
Laboratory ID:	11-213-03					
Dissolved Organic Carbon	**7.0**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**EVAMS-20181126**					
Laboratory ID:	11-213-04					
Dissolved Organic Carbon	**8.0**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**EVALSS-20181126**					
Laboratory ID:	11-213-05					
Dissolved Organic Carbon	**8.5**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**MONMN-20181126**					
Laboratory ID:	11-213-06					
Dissolved Organic Carbon	**7.6**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**MONMS-20181126**					
Laboratory ID:	11-213-07					
Dissolved Organic Carbon	**8.9**	1.0	SM 5310B	11-28-18	11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181126**					
Laboratory ID:	11-213-08					
Dissolved Organic Carbon	**8.1**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**SEIMN-20181126**					
Laboratory ID:	11-213-09					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**SEIMS-20181126**					
Laboratory ID:	11-213-10					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**TOSMI-20181126**					
Laboratory ID:	11-213-11					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**TOSMO-20181126**					
Laboratory ID:	11-213-12					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**TYLMI-20181126**					
Laboratory ID:	11-213-13					
Dissolved Organic Carbon	**9.3**	1.0	SM 5310B	11-28-18	11-28-18	
Client ID:	**TYLMO-20181126**					
Laboratory ID:	11-213-14					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	11-28-18	11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA56-20181126**					
Laboratory ID:	11-213-15					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	11-28-18	11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1128D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	11-28-18	11-28-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-213-04								
	ORIG	DUP							
Dissolved Organic Carbon	**7.98**	**8.24**	NA	NA	NA	NA	3	15	
MATRIX SPIKE									
Laboratory ID:	11-213-04								
	MS		MS		MS				
Dissolved Organic Carbon	**19.5**		10.0	7.98	115	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1128D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.2**		10.0	NA	112	80-120	NA	NA	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181126**					
Laboratory ID:	11-213-01					
Total Phosphorus	**0.023**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**COUMI-20181126**					
Laboratory ID:	11-213-02					
Total Phosphorus	**0.15**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**COUMO-20181126**					
Laboratory ID:	11-213-03					
Total Phosphorus	**0.087**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**EVAMS-20181126**					
Laboratory ID:	11-213-04					
Total Phosphorus	**0.027**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**EVALSS-20181126**					
Laboratory ID:	11-213-05					
Total Phosphorus	**0.054**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**MONMN-20181126**					
Laboratory ID:	11-213-06					
Total Phosphorus	**0.10**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**MONMS-20181126**					
Laboratory ID:	11-213-07					
Total Phosphorus	**0.059**	0.010	EPA 365.1	12-3-18	12-4-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181126**					
Laboratory ID:	11-213-08					
Total Phosphorus	**0.13**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**SEIMN-20181126**					
Laboratory ID:	11-213-09					
Total Phosphorus	**0.26**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**SEIMS-20181126**					
Laboratory ID:	11-213-10					
Total Phosphorus	**0.062**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**TOSMI-20181126**					
Laboratory ID:	11-213-11					
Total Phosphorus	**0.077**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**TOSMO-20181126**					
Laboratory ID:	11-213-12					
Total Phosphorus	**0.17**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**TYLMI-20181126**					
Laboratory ID:	11-213-13					
Total Phosphorus	**0.069**	0.010	EPA 365.1	12-3-18	12-4-18	
Client ID:	**TYLMO-20181126**					
Laboratory ID:	11-213-14					
Total Phosphorus	**0.089**	0.010	EPA 365.1	12-3-18	12-4-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA56-20181126**					
Laboratory ID:	11-213-15					
Total Phosphorus	**0.30**	0.010	EPA 365.1	12-3-18	12-4-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1203W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	12-3-18	12-4-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-213-01								
	ORIG	DUP							
Total Phosphorus	**0.0228**	**0.0244**	NA	NA	NA	NA	7	12	
MATRIX SPIKE									
Laboratory ID:	11-213-01								
	MS		MS		MS				
Total Phosphorus	**0.243**		0.250	0.0228	88	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1203W1								
	SB		SB		SB				
Total Phosphorus	**0.232**		0.250	NA	93	83-114	NA	NA	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181126**					
Laboratory ID:	11-213-01					
Copper	**ND**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**ND**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**COUMI-20181126**					
Laboratory ID:	11-213-02					
Copper	**3.8**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**100**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**COUMO-20181126**					
Laboratory ID:	11-213-03					
Copper	**4.0**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**45**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**EVAMS-20181126**					
Laboratory ID:	11-213-04					
Copper	**ND**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**ND**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**EVALSS-20181126**					
Laboratory ID:	11-213-05					
Copper	**1.2**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**ND**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**MONMN-20181126**					
Laboratory ID:	11-213-06					
Copper	**2.9**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**74**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**MONMS-20181126**					
Laboratory ID:	11-213-07					
Copper	**2.3**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**ND**	5.0	EPA 200.8	11-29-18	11-29-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181126**					
Laboratory ID:	11-213-08					
Copper	**3.3**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**42**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**SEIMN-20181126**					
Laboratory ID:	11-213-09					
Copper	**3.9**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**5.6**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**SEIMS-20181126**					
Laboratory ID:	11-213-10					
Copper	**ND**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**ND**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**TOSMI-20181126**					
Laboratory ID:	11-213-11					
Copper	**5.8**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**41**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**TOSMO-20181126**					
Laboratory ID:	11-213-12					
Copper	**7.5**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**50**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**TYLMI-20181126**					
Laboratory ID:	11-213-13					
Copper	**4.9**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**10**	5.0	EPA 200.8	11-29-18	11-29-18	
Client ID:	**TYLMO-20181126**					
Laboratory ID:	11-213-14					
Copper	**23**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**120**	5.0	EPA 200.8	11-29-18	11-29-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA56-20181126**					
Laboratory ID:	11-213-15					
Copper	**5.5**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**15**	5.0	EPA 200.8	11-29-18	11-29-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1129WH1					
Copper	**ND**	1.0	EPA 200.8	11-29-18	11-29-18	
Zinc	**ND**	5.0	EPA 200.8	11-29-18	11-29-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-213-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	11-213-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**93.2**	**94.2**	100	100	ND	**93**	**94**	75-125	1	20	
Zinc	**105**	**105**	100	100	ND	**105**	**105**	75-125	0	20	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181126**					
Laboratory ID:	11-213-01					
Copper	**ND**	1.0	EPA 200.8		11-28-18	
Zinc	**ND**	5.0	EPA 200.8		11-28-18	
Client ID:	**COUMI-20181126**					
Laboratory ID:	11-213-02					
Copper	**1.7**	1.0	EPA 200.8		11-28-18	
Zinc	**54**	5.0	EPA 200.8		11-28-18	
Client ID:	**COUMO-20181126**					
Laboratory ID:	11-213-03					
Copper	**2.0**	1.0	EPA 200.8		11-28-18	
Zinc	**27**	5.0	EPA 200.8		11-28-18	
Client ID:	**EVAMS-20181126**					
Laboratory ID:	11-213-04					
Copper	**ND**	1.0	EPA 200.8		11-28-18	
Zinc	**ND**	5.0	EPA 200.8		11-28-18	
Client ID:	**EVALSS-20181126**					
Laboratory ID:	11-213-05					
Copper	**ND**	1.0	EPA 200.8		11-28-18	
Zinc	**ND**	5.0	EPA 200.8		11-28-18	
Client ID:	**MONMN-20181126**					
Laboratory ID:	11-213-06					
Copper	**1.6**	1.0	EPA 200.8		11-28-18	
Zinc	**46**	5.0	EPA 200.8		11-28-18	
Client ID:	**MONMS-20181126**					
Laboratory ID:	11-213-07					
Copper	**1.9**	1.0	EPA 200.8		11-28-18	
Zinc	**ND**	5.0	EPA 200.8		11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181126**					
Laboratory ID:	11-213-08					
Copper	**1.6**	1.0	EPA 200.8		11-28-18	
Zinc	**13**	5.0	EPA 200.8		11-28-18	
Client ID:	**SEIMN-20181126**					
Laboratory ID:	11-213-09					
Copper	**ND**	1.0	EPA 200.8		11-28-18	
Zinc	**ND**	5.0	EPA 200.8		11-28-18	
Client ID:	**SEIMS-20181126**					
Laboratory ID:	11-213-10					
Copper	**ND**	1.0	EPA 200.8		11-28-18	
Zinc	**ND**	5.0	EPA 200.8		11-28-18	
Client ID:	**TOSMI-20181126**					
Laboratory ID:	11-213-11					
Copper	**2.9**	1.0	EPA 200.8		11-28-18	
Zinc	**24**	5.0	EPA 200.8		11-28-18	
Client ID:	**TOSMO-20181126**					
Laboratory ID:	11-213-12					
Copper	**2.6**	1.0	EPA 200.8		11-28-18	
Zinc	**9.2**	5.0	EPA 200.8		11-28-18	
Client ID:	**TYLMI-20181126**					
Laboratory ID:	11-213-13					
Copper	**3.3**	1.0	EPA 200.8		11-28-18	
Zinc	**5.4**	5.0	EPA 200.8		11-28-18	
Client ID:	**TYLMO-20181126**					
Laboratory ID:	11-213-14					
Copper	**2.7**	1.0	EPA 200.8		11-28-18	
Zinc	**5.3**	5.0	EPA 200.8		11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA56-20181126**					
Laboratory ID:	11-213-15					
Copper	**2.8**	1.0	EPA 200.8		11-28-18	
Zinc	**7.7**	5.0	EPA 200.8		11-28-18	

Date of Report: December 13, 2018
Samples Submitted: November 27, 2018
Laboratory Reference: 1811-213
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1128D1					
Copper	**ND**	1.0	EPA 200.8		11-28-18	
Zinc	**ND**	5.0	EPA 200.8		11-28-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-213-15										
	ORIG	DUP									
Copper	**2.82**	**2.70**	NA	NA		NA		NA	4	20	
Zinc	**7.74**	**6.90**	NA	NA		NA		NA	11	20	
MATRIX SPIKES											
Laboratory ID:	11-213-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**69.4**	**71.4**	80.0	80.0	2.82	**83**	**86**	75-125	3	20	
Zinc	**77.8**	**82.2**	80.0	80.0	7.74	**88**	**93**	75-125	6	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Dec 13 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181126	Water	18-A021167	Micro, NUT
COUMI-20181126	Water	18-A021168	Micro, NUT
COUMO-20181126	Water	18-A021169	Micro, NUT
EVAMS-20181126	Water	18-A021170	Micro, NUT
EVALSS-20181126	Water	18-A021171	Micro, NUT
MONMN-20181126	Water	18-A021172	Micro, NUT
MONMS-20181126	Water	18-A021173	Micro, NUT
MONM-20181126	Water	18-A021174	Micro, NUT
SEIMN-20181126	Water	18-A021175	Micro, NUT
SEIMS-20181126	Water	18-A021176	Micro, NUT
TOSMI-20181126	Water	18-A021177	Micro, NUT
TOSMO-20181126	Water	18-A021178	Micro, NUT
TYLMI-20181126	Water	18-A021179	Micro, NUT
TYLMO-20181126	Water	18-A021180	Micro, NUT
QA56-20181126	Water	18-A021181	Micro, NUT

Your samples were received on Tuesday, November 27, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Dec 13 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 11-213

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED
Project #: 14-05806-000
PO Number: 11-213
All results reported on an as received basis.

Date Received: 11/27/18
Date Reported: 12/13/18

AMTEST Identification Number **18-A021167**
Client Identification **COLM-20181126**
Sampling Date **11/26/18, 19:10**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	130	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.90	mg/l		0.1			
Total Nitrogen (TKN)	0.640	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	0.26	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021168**
Client Identification **COUMI-20181126**
Sampling Date **11/26/18, 16:15**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	370	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.97	mg/l		0.1			
Total Nitrogen (TKN)	0.738	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	0.23	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021169**
Client Identification **COUMO-20181126**
Sampling Date **11/26/18, 16:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	1200	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.90	mg/l		0.1			
Total Nitrogen (TKN)	0.523	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	0.38	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021170**
Client Identification **EVAMS-20181126**
Sampling Date **11/26/18, 17:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	12.	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.69	mg/l		0.1			
Total Nitrogen (TKN)	0.493	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	1.2	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021171**
Client Identification **EVALSS-20181126**
Sampling Date **11/26/18, 17:20**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	46.	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.70	mg/l		0.1			
Total Nitrogen (TKN)	0.600	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	1.1	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021172**
Client Identification **MONMN-20181126**
Sampling Date **11/26/18, 18:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	430	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	3.00	mg/l		0.1			
Total Nitrogen (TKN)	0.596	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	2.4	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021173**
Client Identification **MONMS-20181126**
Sampling Date **11/26/18, 18:20**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	240	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.480	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	0.15	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021174**
Client Identification **MONM-20181126**
Sampling Date **11/26/18, 20:05**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	510	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.10	mg/l		0.1			
Total Nitrogen (TKN)	0.800	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	0.30	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021175**
Client Identification **SEIMN-20181126**
Sampling Date **11/26/18, 18:10**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	50.	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.84	mg/l		0.1			
Total Nitrogen (TKN)	0.694	mg/l		0.1	EPA 351.2	JC	11/30/18
Total Nitrate + Nitrite	0.15	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021176**
Client Identification **SEIMS-20181126**
Sampling Date **11/26/18, 20:20**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	140	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.452	mg/l		0.1	EPA 351.2	JC	12/12/18
Total Nitrate + Nitrite	0.23	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021177**
Client Identification **TOSMI-20181126**
Sampling Date **11/26/18, 16:10**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	700	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.67	mg/l		0.1			
Total Nitrogen (TKN)	0.189	mg/l		0.1	EPA 351.2	JC	12/12/18
Total Nitrate + Nitrite	0.48	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021178**
Client Identification **TOSMO-20181126**
Sampling Date **11/26/18, 16:40**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	420	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.70	mg/l		0.1			
Total Nitrogen (TKN)	0.237	mg/l		0.1	EPA 351.2	JC	12/12/18
Total Nitrate + Nitrite	0.46	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021179**
Client Identification **TYLMI-20181126**
Sampling Date **11/26/18, 17:35**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	270	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.401	mg/l		0.1	EPA 351.2	JC	12/12/18
Total Nitrate + Nitrite	0.34	mg/l		0.01	EPA 353.2	JC	12/04/18

AMTEST Identification Number **18-A021180**
Client Identification **TYLMO-20181126**
Sampling Date **11/26/18, 17:10**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	460	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.36	mg/l		0.1			
Total Nitrogen (TKN)	0.185	mg/l		0.1	EPA 351.2	JC	12/12/18
Total Nitrate + Nitrite	0.18	mg/l		0.01	EPA 353.2	JC	12/04/18

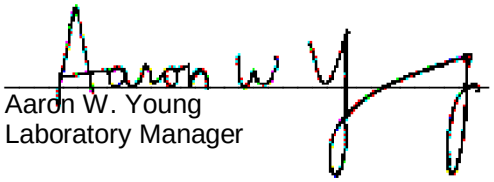
AMTEST Identification Number **18-A021181**
Client Identification **QA56-20181126**
Sampling Date **11/26/18, 17:30**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	630	CFU/100 ml		2	SM 9222D	JM	11/27/18 14:45

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.00	mg/l		0.1			
Total Nitrogen (TKN)	0.805	mg/l		0.1	EPA 351.2	JC	12/12/18
Total Nitrate + Nitrite	0.19	mg/l		0.01	EPA 353.2	JC	12/04/18



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 18-A021167 to 18-A021181

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A021170	Fecal coliform	CFU/100 ml	12.	16.	29.
18-A021181	Fecal coliform	CFU/100 ml	630	380	50.
18-A021202	Fecal coliform	CFU/100 ml	100	90.	11.
18-A020261	Total Nitrogen (TKN)	mg/l	0.101	< 0.1	
18-A021168	Total Nitrogen (TKN)	mg/l	0.738	0.774	4.8
18-A021175	Total Nitrogen (TKN)	mg/l	0.694	0.675	2.8
18-A021229	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A021615	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A021703	Total Nitrogen (TKN)	mg/l	0.526	0.471	11.
18-A021175	Total Nitrate + Nitrite	mg/l	0.15	0.15	0.00
18-A021202	Total Nitrate + Nitrite	mg/l	0.19	0.18	5.4
18-A021247	Total Nitrate + Nitrite	mg/l	3.1	3.0	3.3
18-A021271	Total Nitrate + Nitrite	mg/l	0.18	0.18	0.00
18-A021348	Total Nitrate + Nitrite	mg/l	0.56	0.55	1.8
18-A021428	Total Nitrate + Nitrite	mg/l	< 0.01	< 0.01	
18-A021439	Total Nitrate + Nitrite	mg/l	0.27	0.27	0.00

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A020261	Total Nitrogen (TKN)	mg/l	0.101	1.20	1.00	109.90 %
18-A021168	Total Nitrogen (TKN)	mg/l	0.738	1.86	1.00	112.20 %
18-A021175	Total Nitrogen (TKN)	mg/l	0.694	1.84	1.00	114.60 %
18-A021229	Total Nitrogen (TKN)	mg/l	< 0.1	1.05	1.00	105.00 %
18-A021615	Total Nitrogen (TKN)	mg/l	< 0.1	0.981	1.00	98.10 %
18-A021703	Total Nitrogen (TKN)	mg/l	0.526	1.57	1.00	104.40 %
18-A021175	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %
18-A021202	Total Nitrate + Nitrite	mg/l	0.19	1.2	1.0	101.00 %
18-A021247	Total Nitrate + Nitrite	mg/l	3.1	14.	10.	109.00 %
18-A021271	Total Nitrate + Nitrite	mg/l	0.18	1.2	1.0	102.00 %
18-A021348	Total Nitrate + Nitrite	mg/l	0.56	1.6	1.0	104.00 %
18-A021428	Total Nitrate + Nitrite	mg/l	< 0.01	0.99	1.0	99.00 %
18-A021439	Total Nitrate + Nitrite	mg/l	0.27	1.3	1.0	103.00 %

QC Summary for sample numbers: 18-A021167 to 18-A021181...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	1.05	105. %
Total Nitrogen (TKN)	mg/l	1.00	1.01	101. %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 11-213

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20181126 21167	11/26/18	19:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20181126 68	11/26/18	16:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20181126 69	11/26/18	16:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20181126 70	11/26/18	17:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20181126 71	11/26/18	17:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20181126 72	11/26/18	18:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20181126 73	11/26/18	18:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20181126 74	11/26/18	20:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20181126 75	11/26/18	18:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20181126 76	11/26/18	20:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	11/27/18	12:45	
Received by:	Amtest	11/27/18	12:45	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

T=6.5

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 11-213

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20181126 21177	11/26/18	16:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20181126 78	11/26/18	16:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20181126 79	11/26/18	17:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMC-20181126 80	11/26/18	17:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA56-20181126 81	11/26/18	17:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	Onsite	11/27/18	1245	
Received by:	Amtest	11/27/18	1245	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Laboratory No. 11-213

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
						Requested Analyses											
1	COLM-2018 1126 * see notes	11/26/18	1910	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1126	11/26/18	1615	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1126		1600	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1126		1700	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1126		1720	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1126		1800	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1126		1826	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1126		2005	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1126 * see notes		1810	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1126 ~~* see notes~~		2020	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1126		1610	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1126		1640	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1126		1735	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1126		1710	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 56 20181126	11/26/18	1730	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by George Iftner Date 11/27/18 Received by _____ Date 11/27
Firm Herrera Env. Consultants Time 08:10 AM Firm Alpha Time 9:50a
Relinquished by _____ Date 11/27 Received by _____ Date 11/27/18
Firm Alpha Time 10:31 Firm ORE Time 1031

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample
* the labels on bottles "COLM" should say "SEIMN" and the bottles labeled "SEIMN" should be "COLM". We tried to relabel but they were too wet.

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No. 11-213

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iffner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-20181126 * See notes	11/26/18	1910	Water	7	x	x	x	x	x	x	x	x	x			
2	COUMI-2018 1126	11/26/18	1615	Water	7	x	x	x	x	x	x	x	x	x			
3	COUMO-2018 1126		1600	Water	7	x	x	x	x	x	x	x	x	x			
4	EVAMS-2018 1126		1700	Water	7	x	x	x	x	x	x	x	x	x			
5	EVALSS-2018 1126		1720	Water	7	x	x	x	x	x	x	x	x	x			
6	MONMN-2018 1126		1800	Water	7	x	x	x	x	x	x	x	x	x			
7	MONMS-2018 1126		1820	Water	7	x	x	x	x	x	x	x	x	x			
8	MONM-2018 1126		2005	Water	7	x	x	x	x	x	x	x	x	x			
9	SEIMN-2018 1126 * See notes		1810	Water	7	x	x	x	x	x	x	x	x	x			
10	SEIMS-2018 1126 ~~* See notes~~		2020	Water	7	x	x	x	x	x	x	x	x	x			
11	TOSMI-2018 1126		1610	Water	7	x	x	x	x	x	x	x	x	x			
12	TOSMO-2018 1126		1640	Water	7	x	x	x	x	x	x	x	x	x			
13	TYLMI-2018 1126		1735	Water	7	x	x	x	x	x	x	x	x	x			
14	TYLMO-2018 1126		1710	Water	7	x	x	x	x	x	x	x	x	x			
15	QA 562018 1126	11/26/18	1730	Water	7	x	x	x	x	x	x	x	x	x			

Relinquished by George Iffner Date 11/27/18 Received by _____ Date 11/27
Firm Herrera Env. Consultants Time 08:10 AM Firm Alpha Time 9:50a
Relinquished by _____ Date 11/27 Received _____ Date 11/27/18
Firm Alpha Time 10:31 Firm OSE Time 1031

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample
* the labels on bottles "COLM" should say "SEIMN" and the bottles labeled "SEIMN" should be "COLM" we tried to relabel but they

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Gretchen Kayser
Meter:	YSI ProDSS #2
Date/Time:	11/26/18 14.00
Barometric Pressure Start of Day:	mmHg: 754.8 Time: 14.00
Barometric Pressure End of Day:	mmHg: 750.1 Time: 11/27/18 8:15

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	7.6	0	23.0	No Cal Herrera DI
Conductivity (µS/cm)	956	1,000	23.0	Post-Cal Value 1000
Conductivity (µS/cm)	102.6	100	23.4	Post Cal Value 100.0
DO % Saturation	99.2	100	22.6	Post Cal Value 99.2

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.8	0	21.9	
Conductivity (µS/cm)	96.3	100	22.6	
DO % Saturation	99.0	100	21.8	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Gretchen Kayser
Meter:	YSI ProDSS #1
Date/Time:	11/26/18 14:00
Barometric Pressure Start of Day:	mmHg: 753.7 Time: 14:00
Barometric Pressure End of Day:	mmHg: 749.5 Time: 11/27/18 8:15

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	6.5	0	22.6	No Cal Herrera DI
Conductivity (µS/cm)	976	1,000	22.5	Post Cal Value 1000
Conductivity (µS/cm)	102.7	100	22.5	Post Cal Value 100.0
DO % Saturation	99.1	100	22.3	Post Cal 99.1

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.7	0	21.6	
Conductivity (µS/cm)	97.2	100	22.2	
DO % Saturation	100.0	100	21.7	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, K. Bliss

Sample Date: 11/26/18 **Sample Time:** ~~18:10~~ 19:10 PDT

Base Flow or Storm Event? Storm **Field Filtered Time:** ~~18:20~~ 19:20 ✓

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 52° rain

Water Quality Sampling

Sample ID: COLM-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	X
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	X
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	colorless
Odor:	odorless
Sheen:	NA
Floatables:	NA.

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: ~~[illegible]~~ John Lenth **Signature:**

Date Checked: ~~[illegible]~~ 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 ✓
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.80'

Reference Point (description): staff gage

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 39.9

Dissolved Oxygen (mg/L) 11.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB + GK

Sample Date: 11/26/18 **Sample Time:** 1615 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1620

(Must filter within 15 minutes of collection)

SITE ID: COUMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 54° + Rainy

Water Quality Sampling

Sample ID: COUMI-20181116

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum ~~hand pump~~

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	v. light brown
Odor:	NA
Sheen:	NA
Floatables:	NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zina Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- ~~YSI Pro DSS 1~~
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.77 → as FVM = 2.77 MM

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.4

Specific Conductivity (µs/cm) 137.6

Dissolved Oxygen (mg/L) 11.23

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB + GK

Sample Date: 11/26/18 Sample Time: 16:00 PDT: Field Filtered Time: 16:05 PST: X

Base Flow or Storm Event? (Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 54° + Rainy

Water Quality Sampling

Sample ID: COUMO-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: light brown

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lentz Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.49

Reference Point (description): S.G.

Water Quality Measurments

Temperature (°C) 9.9

Specific Conductivity (µs/cm) 105.3

Dissolved Oxygen (mg/L) 10.93

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, K. Bliss

Sample Date: 11/26/18 Sample Time: 17:00 PDT:

Base Flow or Storm Event? Storm Field Filtered Time: 17:10 PST: ✓

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 52°

Water Quality Sampling

Sample ID: EVAMS-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	X
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. [redacted]phorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	X
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	colorless
Odor:	odorless
Sheen:	NA
Floatables:	NA

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Zahan Lentz Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 ✓
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.94'

Reference Point (description): staff gauge

Water Quality Measurments

Temperature (°C) 8.5°C

Specific Conductivity (µs/cm) 184 ← assume 184.0 MM

Dissolved Oxygen (mg/L) 11.37

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, K. Bliss

Sample Date: 11/26/18 **Sample Time:** 17:20 PDT:

Base Flow or Storm Event? Storm **Field Filtered Time:** 17:30 PST: ✓

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 52° rain

Water Quality Sampling

Sample ID: EVALSS-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	✓
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	✓
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	Very light brown
Odor:	odorless
Sheen:	NA
Floatables:	N/A.

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sylvia Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 ✓
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.40

Reference Point (description): Stream gauge

Water Quality Measurments

Temperature (°C) 8.2°C

Specific Conductivity (µs/cm) 172

Dissolved Oxygen (mg/L) 11.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB + GK

Sample Date: 11/26/18 **Sample Time:** 1800 PDT.

Base Flow or Storm Event? **Field Filtered Time:** 1805 PST X

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 50° + Rainy

Water Quality Sampling

Sample ID: MONMN - 20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: some

Color: light brown

Odor: NA

Sheen: NA

Floatables: leaves bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Julia Lacitis **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.36

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 8.5

Specific Conductivity (µs/cm) ~~108~~ 108.1

Dissolved Oxygen (mg/L) 11.01

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB+GK

Sample Date: 11/26/18 **Sample Time:** 1820 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1825 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 51° +Rainy

Water Quality Sampling

Sample ID: MONMS-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: light brown

Odor: NA

Sheen: NA

Floatables: v little

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leuth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.93

Reference Point (description): Vault PVC

Water Quality Measurments

Temperature (°C) 9.2

Specific Conductivity (µs/cm) 170.0

Dissolved Oxygen (mg/L) 8.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB + GK

Sample Date: 11/26/18 **Sample Time:** 2005 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 2010 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 50+ Rainy

Water Quality Sampling

Sample ID: MONM-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	cloudy
Color:	Brown
Odor:	NA
Sheen:	NA
Floatables:	some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 107.7

Dissolved Oxygen (mg/L) 11.47

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, K. Bliss

Sample Date: 11/26/18 **Sample Time:** 18:10 PDT: ☐

Base Flow or Storm Event? Storm **Field Filtered Time:** 18:20 PST: ☑

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 52° rain

HERRERA

Water Quality Sampling

Sample ID: SEIMN-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	Very light brown
Odor:	Odorless
Sheen:	NA
Floatables:	NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 ✓
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.64'

Reference Point (description): Down from top of Bolt.

Water Quality Measurments

Temperature (°C) 8.1 C

Specific Conductivity (µs/cm) 70.

Dissolved Oxygen (mg/L) 11.78

Assume 70.0 MM

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Effner, K. Bliss

Sample Date: 11/26/18 **Sample Time:** 2030 PDT

Base Flow or Storm Event? storm **Field Filtered Time:** 2030 PST ✓

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 52° rain.

Water Quality Sampling

Sample ID: SEIMS-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	X
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	X
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	V. light brown
Odor:	odorless
Sheen:	NA
Floatables:	NA.

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES ✓ NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 ✓
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.88

Reference Point (description): staff gage

Water Quality Measurments

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 96.1

Dissolved Oxygen (mg/L) 10.74

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, K. Bliss

Sample Date: 11/26/18 **Sample Time:** 16:10 PDT: ~~✓~~ PST: ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 16:20

(Must filter within 15 minutes of collection)

SITE ID: TOSMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Raining, 52°

Water Quality Sampling

Sample ID: TOSMI-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	V. slightly turbid
Color:	colorless
Odor:	colorless
Sheen:	NA
Floatables:	N.F.

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Louth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 ✓
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.94'

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 10.1 °C

Specific Conductivity (µs/cm) 73.1

Dissolved Oxygen (mg/L) 11.32

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BR + GK

Sample Date: 11/26/18 **Sample Time:** 1640 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1645 PST: X

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 52° + rainy

Water Quality Sampling

Sample ID: TOSMO-2018 1126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
. Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Cloudy

Color: brown

Odor: NA

Sheen: NA

Floatables: some floatables + organic debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Erin Leutheuser **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

~~YSI Pro DSS 2~~

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.89

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.0

Specific Conductivity (µs/cm) 112.0

Dissolved Oxygen (mg/L) 11.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB + GK

Sample Date: 11/26/18 **Sample Time:** 1735 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1740

(Must filter within 15 minutes of collection)

SITE ID: TYLMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 51° + Rainy

Water Quality Sampling

Sample ID: TYLMI-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear with leaves

Color: light brown

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.37

Reference Point (description): Top of Culvert

Water Quality Measurments

Temperature (°C) 9.3

Specific Conductivity (µs/cm) 91.7

Dissolved Oxygen (mg/L) 10.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB+GK

Sample Date: 11/26/18 **Sample Time:** 1710 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1715 PST: X

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 52° + Rainy

Water Quality Sampling

Sample ID: TYLMO-20181126

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	Y
DOC *	HDPE	250 ml	1	HCL	Y
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	Y
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	Y
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	Y
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	Y
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	Y

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA56-20181126 @17:30

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: ~clear

Color: light brown

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lentin **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.67

Reference Point (description): Top of Culvert

Water Quality Measurments

Temperature (°C) 9.6

Specific Conductivity (µs/cm) 60.8

Dissolved Oxygen (mg/L) 11.06

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/4/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 11/26/2018 / All locations, QA56 (TYLMO) Lab Ref No 1811-213

date 1/14/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	2	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	95	**±20**	22	**≤ 25**	95	**≤ 25**	OK	J TYLMO DUE TO FD RPD
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	5	**≤ 25**	42	**≤ 25**	OK	J TYLMO DUE TO FD RPD
Hardness	OK / SM 2340B	NA	**NA**	8	**≤180**	≤1.0 mg/L 1.0 mg/L	107,107	**±25**	104	**±15**	2	**≤ 20**	37	**≤ 20**	OK	J TYLMO DUE TO FD RPD
DOC	OK / SM 5310B	<15	**≤15**	2	**≤28**	≤1.0 mg/L 1.0 mg/L	115	**±25**	112	**±15**	3	**≤ 20**	0	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	8	**≤28**	≤0.01 mg/L 0.01 mg/L	88	**±25**	93	**±20**	7	**≤ 20**	109	**≤ 20**	OK	J TYLMO DUE TO FD RPD
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	4,8	**≤28**	≤0.1 mg/L 0.1 mg/L	112-115 95	**±25**	94-105	**±20**	4.8, 2.8, 0	**≤ 20**	D=0.62 5.4	**≤ 20**	OK	J TYLMO FOR TKN DUE TO FD RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/4/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 11/26/2018 / All locations, QA56 (TYLMO) Lab Ref No 1811-213

date 1/14/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	3	**≤180**	≤1.0 µg/L 1.0 µg/L	93,94	**±25**	NR	**±15**	NC, 1	**≤ 20**	123	**≤ 20**	OK	J TYLMO DUE TO FD RPD
Total Zinc	OK/ EPA 200.8	NA	**NA**	3	**≤180**	≤5.0 µg/L 5.0 µg/L	105,105	**±25**	NR	**±15**	NC, 0	**≤ 20**	156	**≤ 20**	OK	J TYLMO DUE TO FD RPD
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	83,86	**±25**	NR	**±15**	4,3	**≤ 20**	3.6	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	88,93	**±25**	NR	**±15**	11,6	**≤ 20**	D=2.4	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	29, 50	**≤ 35**	31	**≤ 50**	OK	J QA56 DUE TO LAB DUP RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

January 3, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1812-088

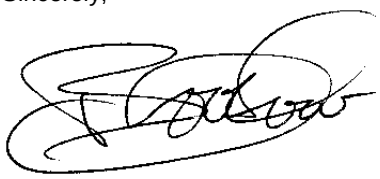
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on December 9, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

Case Narrative

Samples were collected on December 9, 2018 and received by the laboratory on December 9, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181209**					
Laboratory ID:	12-088-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	12-12-18	12-13-18	
Client ID:	**COUMI-20181209**					
Laboratory ID:	12-088-02					
Total Suspended Solids	**57**	1.7	SM 2540D	12-12-18	12-13-18	
Client ID:	**COUMO-20181209**					
Laboratory ID:	12-088-03					
Total Suspended Solids	**28**	1.3	SM 2540D	12-12-18	12-13-18	
Client ID:	**EVAMS-20181209**					
Laboratory ID:	12-088-04					
Total Suspended Solids	**7.8**	1.1	SM 2540D	12-12-18	12-13-18	
Client ID:	**EVALSS-20181209**					
Laboratory ID:	12-088-05					
Total Suspended Solids	**28**	1.1	SM 2540D	12-12-18	12-13-18	
Client ID:	**MONMN-20181209**					
Laboratory ID:	12-088-06					
Total Suspended Solids	**20**	1.0	SM 2540D	12-12-18	12-13-18	
Client ID:	**MONMS-20181209**					
Laboratory ID:	12-088-07					
Total Suspended Solids	**3.6**	1.0	SM 2540D	12-12-18	12-13-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181209**					
Laboratory ID:	12-088-08					
Total Suspended Solids	**25**	1.1	SM 2540D	12-12-18	12-13-18	
Client ID:	**SEIMN-20181209**					
Laboratory ID:	12-088-09					
Total Suspended Solids	**56**	1.4	SM 2540D	12-12-18	12-13-18	
Client ID:	**SEIMS-20181209**					
Laboratory ID:	12-088-10					
Total Suspended Solids	**140**	2.0	SM 2540D	12-12-18	12-13-18	
Client ID:	**TOSMI-20181209**					
Laboratory ID:	12-088-11					
Total Suspended Solids	**96**	2.0	SM 2540D	12-12-18	12-13-18	
Client ID:	**TOSMO-20181209**					
Laboratory ID:	12-088-12					
Total Suspended Solids	**94**	2.0	SM 2540D	12-12-18	12-13-18	
Client ID:	**TYLMI-20181209**					
Laboratory ID:	12-088-13					
Total Suspended Solids	**48**	1.4	SM 2540D	12-12-18	12-13-18	
Client ID:	**TYLMO-20181209**					
Laboratory ID:	12-088-14					
Total Suspended Solids	**39**	1.4	SM 2540D	12-12-18	12-13-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA57-20181209**					
Laboratory ID:	12-088-15					
Total Suspended Solids	**82**	2.0	SM 2540D	12-12-18	12-13-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1212W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	12-12-18	12-13-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-088-10								
	ORIG	DUP							
Total Suspended Solids	**143**	**210**	NA	NA	NA	NA	38	22	K
SPIKE BLANK									
Laboratory ID:	SB1212W1								
	SB		SB		SB				
Total Suspended Solids	**95.0**		100	NA	95	76-114	NA	NA	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181209**					
Laboratory ID:	12-088-01					
Turbidity	**2.0**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**COUMI-20181209**					
Laboratory ID:	12-088-02					
Turbidity	**26**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**COUMO-20181209**					
Laboratory ID:	12-088-03					
Turbidity	**15**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**EVAMS-20181209**					
Laboratory ID:	12-088-04					
Turbidity	**3.7**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**EVALSS-20181209**					
Laboratory ID:	12-088-05					
Turbidity	**8.3**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**MONMN-20181209**					
Laboratory ID:	12-088-06					
Turbidity	**10**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**MONMS-20181209**					
Laboratory ID:	12-088-07					
Turbidity	**2.3**	0.10	EPA 180.1	12-10-18	12-10-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181209**					
Laboratory ID:	12-088-08					
Turbidity	**14**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**SEIMN-20181209**					
Laboratory ID:	12-088-09					
Turbidity	**20**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**SEIMS-20181209**					
Laboratory ID:	12-088-10					
Turbidity	**40**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**TOSMI-20181209**					
Laboratory ID:	12-088-11					
Turbidity	**30**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**TOSMO-20181209**					
Laboratory ID:	12-088-12					
Turbidity	**46**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**TYLMI-20181209**					
Laboratory ID:	12-088-13					
Turbidity	**18**	0.10	EPA 180.1	12-10-18	12-10-18	
Client ID:	**TYLMO-20181209**					
Laboratory ID:	12-088-14					
Turbidity	**20**	0.10	EPA 180.1	12-10-18	12-10-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA57-20181209**					
Laboratory ID:	12-088-15					
Turbidity	**28**	0.10	EPA 180.1	12-10-18	12-10-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1210W1					
Turbidity	**ND**	0.10	EPA 180.1	12-10-18	12-10-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-088-02								
	ORIG	DUP							
Turbidity	**26.3**	**27.7**	NA	NA	NA	NA	5	15	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181209**					
Laboratory ID:	12-088-01					
Hardness	**13**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**COUMI-20181209**					
Laboratory ID:	12-088-02					
Hardness	**73**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**COUMO-20181209**					
Laboratory ID:	12-088-03					
Hardness	**65**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**EVAMS-20181209**					
Laboratory ID:	12-088-04					
Hardness	**84**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**EVALSS-20181209**					
Laboratory ID:	12-088-05					
Hardness	**80**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**MONMN-20181209**					
Laboratory ID:	12-088-06					
Hardness	**73**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**MONMS-20181209**					
Laboratory ID:	12-088-07					
Hardness	**130**	1.0	200.7/SM 2340B	12-14-18	12-17-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181209**					
Laboratory ID:	12-088-08					
Hardness	**85**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**SEIMN-20181209**					
Laboratory ID:	12-088-09					
Hardness	**33**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**SEIMS-20181209**					
Laboratory ID:	12-088-10					
Hardness	**62**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**TOSMI-20181209**					
Laboratory ID:	12-088-11					
Hardness	**41**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**TOSMO-20181209**					
Laboratory ID:	12-088-12					
Hardness	**55**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**TYLMI-20181209**					
Laboratory ID:	12-088-13					
Hardness	**55**	1.0	200.7/SM 2340B	12-14-18	12-17-18	
Client ID:	**TYLMO-20181209**					
Laboratory ID:	12-088-14					
Hardness	**38**	1.0	200.7/SM 2340B	12-14-18	12-17-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA57-20181209**					
Laboratory ID:	12-088-15					
Hardness	**40**	1.0	200.7/SM 2340B	12-14-18	12-17-18	

Date of Report: January 3, 2019
Samples Submitted: December 9, 2018
Laboratory Reference: 1812-088
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1214WH2					
Hardness	**ND**	1.0	200.7/SM 2340B	12-14-18	12-17-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-088-01										
	ORIG	DUP									
Hardness	**12.7**	**0**	NA		NA	NA		NA	200	20	
MATRIX SPIKES											
Laboratory ID:	12-088-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**136**	**136**	132	132	12.7	93	93	75-125	0	20	
SPIKE BLANK											
Laboratory ID:	SB1214WH2										
	SB		SB			SB					
Hardness	**123**		132		NA	93		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181209**					
Laboratory ID:	12-088-01					
Dissolved Organic Carbon	**16**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**COUMI-20181209**					
Laboratory ID:	12-088-02					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**COUMO-20181209**					
Laboratory ID:	12-088-03					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**EVAMS-20181209**					
Laboratory ID:	12-088-04					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**EVALSS-20181209**					
Laboratory ID:	12-088-05					
Dissolved Organic Carbon	**4.6**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**MONMN-20181209**					
Laboratory ID:	12-088-06					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**MONMS-20181209**					
Laboratory ID:	12-088-07					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	12-13-18	12-13-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181209**					
Laboratory ID:	12-088-08					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**SEIMN-20181209**					
Laboratory ID:	12-088-09					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**SEIMS-20181209**					
Laboratory ID:	12-088-10					
Dissolved Organic Carbon	**7.1**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TOSMI-20181209**					
Laboratory ID:	12-088-11					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TOSMO-20181209**					
Laboratory ID:	12-088-12					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TYLMI-20181209**					
Laboratory ID:	12-088-13					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TYLMO-20181209**					
Laboratory ID:	12-088-14					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	12-13-18	12-13-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA57-20181209**					
Laboratory ID:	12-088-15					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	12-13-18	12-13-18	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1213D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	12-13-18	12-13-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-088-01								
	ORIG	DUP							
Dissolved Organic Carbon	**15.8**	**16.1**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	12-088-01								
	MS		MS		MS				
Dissolved Organic Carbon	**26.7**		10.0	15.8	109	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1213D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.79**		10.0	NA	98	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181209**					
Laboratory ID:	12-088-01					
Total Phosphorus	**0.018**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**COUMI-20181209**					
Laboratory ID:	12-088-02					
Total Phosphorus	**0.17**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**COUMO-20181209**					
Laboratory ID:	12-088-03					
Total Phosphorus	**0.098**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**EVAMS-20181209**					
Laboratory ID:	12-088-04					
Total Phosphorus	**0.032**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**EVALSS-20181209**					
Laboratory ID:	12-088-05					
Total Phosphorus	**0.057**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**MONMN-20181209**					
Laboratory ID:	12-088-06					
Total Phosphorus	**0.080**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**MONMS-20181209**					
Laboratory ID:	12-088-07					
Total Phosphorus	**0.042**	0.010	EPA 365.1	12-14-18	12-17-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181209**					
Laboratory ID:	12-088-08					
Total Phosphorus	**0.093**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**SEIMN-20181209**					
Laboratory ID:	12-088-09					
Total Phosphorus	**0.11**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**SEIMS-20181209**					
Laboratory ID:	12-088-10					
Total Phosphorus	**0.24**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**TOSMI-20181209**					
Laboratory ID:	12-088-11					
Total Phosphorus	**0.14**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**TOSMO-20181209**					
Laboratory ID:	12-088-12					
Total Phosphorus	**0.18**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**TYLMI-20181209**					
Laboratory ID:	12-088-13					
Total Phosphorus	**0.31**	0.010	EPA 365.1	12-14-18	12-17-18	
Client ID:	**TYLMO-20181209**					
Laboratory ID:	12-088-14					
Total Phosphorus	**0.11**	0.010	EPA 365.1	12-14-18	12-17-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA57-20181209**					
Laboratory ID:	12-088-15					
Total Phosphorus	**0.13**	0.010	EPA 365.1	12-14-18	12-17-18	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1214W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	12-14-18	12-17-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-088-01								
	ORIG	DUP							
Total Phosphorus	**0.0179**	**0.0202**	NA	NA	NA	NA	12	12	
MATRIX SPIKE									
Laboratory ID:	12-088-01								
	MS		MS		MS				
Total Phosphorus	**0.256**		0.250	0.0179	95	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1214W1								
	SB		SB		SB				
Total Phosphorus	**0.246**		0.250	NA	98	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181209**					
Laboratory ID:	12-088-01					
Copper	**ND**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**ND**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**COUMI-20181209**					
Laboratory ID:	12-088-02					
Copper	**3.9**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**68**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**COUMO-20181209**					
Laboratory ID:	12-088-03					
Copper	**4.6**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**52**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**EVAMS-20181209**					
Laboratory ID:	12-088-04					
Copper	**ND**	1.0	EPA 200.8	12-11-18	12-11-18	
Zinc	**ND**	5.0	EPA 200.8	12-11-18	12-11-18	
Client ID:	**EVALSS-20181209**					
Laboratory ID:	12-088-05					
Copper	**ND**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**12**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**MONMN-20181209**					
Laboratory ID:	12-088-06					
Copper	**1.9**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**19**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**MONMS-20181209**					
Laboratory ID:	12-088-07					
Copper	**2.2**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**ND**	5.0	EPA 200.8	12-11-18	12-12-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181209**					
Laboratory ID:	12-088-08					
Copper	**2.5**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**28**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**SEIMN-20181209**					
Laboratory ID:	12-088-09					
Copper	**1.6**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**ND**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**SEIMS-20181209**					
Laboratory ID:	12-088-10					
Copper	**6.7**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**30**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**TOSMI-20181209**					
Laboratory ID:	12-088-11					
Copper	**6.7**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**56**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**TOSMO-20181209**					
Laboratory ID:	12-088-12					
Copper	**7.8**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**52**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**TYLMI-20181209**					
Laboratory ID:	12-088-13					
Copper	**7.7**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**35**	5.0	EPA 200.8	12-11-18	12-12-18	
Client ID:	**TYLMO-20181209**					
Laboratory ID:	12-088-14					
Copper	**6.9**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**23**	5.0	EPA 200.8	12-11-18	12-12-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA57-20181209**					
Laboratory ID:	12-088-15					
Copper	**7.9**	1.0	EPA 200.8	12-11-18	12-12-18	
Zinc	**65**	5.0	EPA 200.8	12-11-18	12-12-18	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1211WH1					
Copper	**ND**	1.0	EPA 200.8	12-11-18	12-11-18	
Zinc	**ND**	5.0	EPA 200.8	12-11-18	12-11-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-088-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	12-088-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**101**	**98.8**	100	100	ND	**101**	**99**	75-125	2	20	
Zinc	**103**	**101**	100	100	ND	**103**	**101**	75-125	2	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181209**					
Laboratory ID:	12-088-01					
Copper	**ND**	1.0	EPA 200.8		12-12-18	
Zinc	**ND**	5.0	EPA 200.8		12-12-18	
Client ID:	**COUMI-20181209**					
Laboratory ID:	12-088-02					
Copper	**1.4**	1.0	EPA 200.8		12-11-18	
Zinc	**20**	5.0	EPA 200.8		12-11-18	
Client ID:	**COUMO-20181209**					
Laboratory ID:	12-088-03					
Copper	**2.6**	1.0	EPA 200.8		12-11-18	
Zinc	**26**	5.0	EPA 200.8		12-11-18	
Client ID:	**EVAMS-20181209**					
Laboratory ID:	12-088-04					
Copper	**ND**	1.0	EPA 200.8		12-11-18	
Zinc	**ND**	5.0	EPA 200.8		12-11-18	
Client ID:	**EVALSS-20181209**					
Laboratory ID:	12-088-05					
Copper	**ND**	1.0	EPA 200.8		12-11-18	
Zinc	**7.3**	5.0	EPA 200.8		12-11-18	
Client ID:	**MONMN-20181209**					
Laboratory ID:	12-088-06					
Copper	**1.1**	1.0	EPA 200.8		12-11-18	
Zinc	**6.8**	5.0	EPA 200.8		12-11-18	
Client ID:	**MONMS-20181209**					
Laboratory ID:	12-088-07					
Copper	**1.9**	1.0	EPA 200.8		12-11-18	
Zinc	**ND**	5.0	EPA 200.8		12-11-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181209**					
Laboratory ID:	12-088-08					
Copper	**1.3**	1.0	EPA 200.8		12-11-18	
Zinc	**9.0**	5.0	EPA 200.8		12-11-18	
Client ID:	**SEIMN-20181209**					
Laboratory ID:	12-088-09					
Copper	**ND**	1.0	EPA 200.8		12-11-18	
Zinc	**ND**	5.0	EPA 200.8		12-11-18	
Client ID:	**SEIMS-20181209**					
Laboratory ID:	12-088-10					
Copper	**ND**	1.0	EPA 200.8		12-11-18	
Zinc	**ND**	5.0	EPA 200.8		12-11-18	
Client ID:	**TOSMI-20181209**					
Laboratory ID:	12-088-11					
Copper	**3.5**	1.0	EPA 200.8		12-11-18	
Zinc	**22**	5.0	EPA 200.8		12-11-18	
Client ID:	**TOSMO-20181209**					
Laboratory ID:	12-088-12					
Copper	**2.7**	1.0	EPA 200.8		12-11-18	
Zinc	**9.0**	5.0	EPA 200.8		12-11-18	
Client ID:	**TYLMI-20181209**					
Laboratory ID:	12-088-13					
Copper	**4.4**	1.0	EPA 200.8		12-11-18	
Zinc	**5.2**	5.0	EPA 200.8		12-11-18	
Client ID:	**TYLMO-20181209**					
Laboratory ID:	12-088-14					
Copper	**3.4**	1.0	EPA 200.8		12-11-18	
Zinc	**5.7**	5.0	EPA 200.8		12-11-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA57-20181209**					
Laboratory ID:	12-088-15					
Copper	**3.6**	1.0	EPA 200.8		12-11-18	
Zinc	**26**	5.0	EPA 200.8		12-11-18	

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DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1211D1					
Copper	**ND**	1.0	EPA 200.8		12-11-18	
Zinc	**ND**	5.0	EPA 200.8		12-11-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-088-15										
	ORIG	DUP									
Copper	**3.64**	**3.46**	NA	NA		NA		NA	5	20	
Zinc	**26.0**	**24.8**	NA	NA		NA		NA	5	20	
MATRIX SPIKES											
Laboratory ID:	12-088-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**79.4**	**77.0**	80.0	80.0	3.64	**95**	**92**	75-125	3	20	
Zinc	**104**	**102**	80.0	80.0	26.0	**97**	**95**	75-125	1	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 3 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181209	Water	18-A21784	Micro, NUT
COUMI-20181209	Water	18-A21785	Micro, NUT
COUMO-20181209	Water	18-A21786	Micro, NUT
EVAMS-20181209	Water	18-A21787	Micro, NUT
EVALSS-20181209	Water	18-A21788	Micro, NUT
MONMN-20181209	Water	18-A21789	Micro, NUT
MONMS-20181209	Water	18-A21790	Micro, NUT
MONM-20181209	Water	18-A21791	Micro, NUT
SEIMN-20181209	Water	18-A21792	Micro, NUT
SEIMS-20181209	Water	18-A21793	Micro, NUT
TOSMI-20181209	Water	18-A21794	Micro, NUT
TOSMO-20181209	Water	18-A21795	Micro, NUT
TYLMI-20181209	Water	18-A21796	Micro, NUT
TYLMO-20181209	Water	18-A21797	Micro, NUT
QA57-20181209	Water	18-A21798	Micro, NUT

Your samples were received on Monday, December 10, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 3 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 12-088

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 12-088
All results reported on an as received basis.

Date Received: 12/10/18
Date Reported: 1/ 3/19

AMTEST Identification Number **18-A21784**
Client Identification **COLM-20181209**
Sampling Date **12/09/18, 16:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	5.	CFU/100 ml		2	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.521	mg/l		0.1	SM4500N	JC	12/12/18
Total Nitrate + Nitrite	0.11	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21785**
Client Identification **COUMI-20181209**
Sampling Date **12/09/18, 14:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	280	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.278	mg/l		0.1	SM4500N	JC	12/12/18
Total Nitrate + Nitrite	0.22	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21786**
Client Identification **COUMO-20181209**
Sampling Date **12/09/18, 14:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1500	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.86	mg/l		0.1			
Total Nitrogen (TKN)	0.588	mg/l		0.1	SM4500N	JC	12/12/18
Total Nitrate + Nitrite	0.27	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21787**
Client Identification **EVAMS-20181209**
Sampling Date **12/09/18, 14:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		2	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	2.03	mg/l		0.1			
Total Nitrogen (TKN)	0.328	mg/l		0.1	SM4500N	JC	12/12/18
Total Nitrate + Nitrite	1.7	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21788**
Client Identification **EVALSS-20181209**
Sampling Date **12/09/18, 15:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		2	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	1.72	mg/l		0.1			
Total Nitrogen (TKN)	0.222	mg/l		0.1	SM4500N	JC	12/12/18
Total Nitrate + Nitrite	1.5	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21789**
Client Identification **MONMN-20181209**
Sampling Date **12/09/18, 15:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	44.	CFU/100 ml		2	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.76	mg/l		0.1			
Total Nitrogen (TKN)	0.479	mg/l		0.1	SM4500N	JC	12/12/18
Total Nitrate + Nitrite	0.28	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21790**
Client Identification **MONMS-20181209**
Sampling Date **12/09/18, 15:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		1	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.70	mg/l		0.1			
Total Nitrogen (TKN)	0.468	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.23	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21791**
Client Identification **MONM-20181209**
Sampling Date **12/09/18, 16:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		2	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.81	mg/l		0.1			
Total Nitrogen (TKN)	0.519	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.29	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21792**
Client Identification **SEIMN-20181209**
Sampling Date **12/09/18, 15:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	160	CFU/100 ml		2	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.70	mg/l		0.1			
Total Nitrogen (TKN)	0.490	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.21	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21793**
Client Identification **SEIMS-20181209**
Sampling Date **12/09/18, 16:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	3.21	mg/l		0.1			
Total Nitrogen (TKN)	2.98	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.23	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21794**
Client Identification **TOSMI-20181209**
Sampling Date **12/09/18, 14:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1600	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	1.06	mg/l		0.1			
Total Nitrogen (TKN)	0.818	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.24	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21795**
Client Identification **TOSMO-20181209**
Sampling Date **12/09/18, 14:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1600	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	1.06	mg/l		0.1			
Total Nitrogen (TKN)	0.765	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.30	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21796**
Client Identification **TYLMI-20181209**
Sampling Date **12/09/18, 15:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	180	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.530	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.27	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21797**
Client Identification **TYLMO-20181209**
Sampling Date **12/09/18, 15:15**

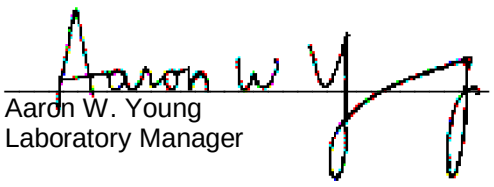
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	300	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	0.87	mg/l		0.1			
Total Nitrogen (TKN)	0.691	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.18	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21798**
Client Identification **QA57-20181209**
Sampling Date **12/09/18, 14:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		20	SM 9222D	NG	12/10/18
Total Nitrogen (NOX&TKN)	1.07	mg/l		0.1			
Total Nitrogen (TKN)	0.828	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.24	mg/l		0.01	SM4500NO3	JC	12/14/18



Aaron W. Young
Laboratory Manager

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Professional Analytical Services

QC Summary for sample numbers: 18-A21784 to 18-A21798

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A021784	Fecal coliform	CFU/100 ml	5.	5.	0.00
18-A021798	Fecal coliform	CFU/100 ml	1100	1200	8.7
18-A021229	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A021615	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A021703	Total Nitrogen (TKN)	mg/l	0.526	0.471	11.
18-A021837	Total Nitrogen (TKN)	mg/l	0.803	0.856	6.4
18-A021977	Total Nitrogen (TKN)	mg/l	0.306	0.350	13.
18-A021985	Total Nitrogen (TKN)	mg/l	0.374	0.371	0.81
18-A022454	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A022458	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A021557	Total Nitrate + Nitrite	mg/l	0.32	0.30	6.5
18-A021586	Total Nitrate + Nitrite	mg/l	1.0	0.99	1.0
18-A021602	Total Nitrate + Nitrite	mg/l	0.81	0.82	1.2
18-A021790	Total Nitrate + Nitrite	mg/l	0.23	0.22	4.4
18-A021839	Total Nitrate + Nitrite	mg/l	0.036	0.033	8.7
18-A021858	Total Nitrate + Nitrite	mg/l	0.28	0.28	0.00
18-A021937	Total Nitrate + Nitrite	mg/l	0.24	0.24	0.00
18-A021973	Total Nitrate + Nitrite	mg/l	0.30	0.31	3.3
18-A021983	Total Nitrate + Nitrite	mg/l	0.22	0.22	0.00
18-A022051	Total Nitrate + Nitrite	mg/l	0.49	0.51	4.0

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A021229	Total Nitrogen (TKN)	mg/l	< 0.1	1.05	1.00	105.00 %
18-A021615	Total Nitrogen (TKN)	mg/l	< 0.1	0.981	1.00	98.10 %
18-A021703	Total Nitrogen (TKN)	mg/l	0.526	1.57	1.00	104.40 %
18-A021837	Total Nitrogen (TKN)	mg/l	0.803	1.77	1.00	96.70 %
18-A021977	Total Nitrogen (TKN)	mg/l	0.306	1.27	1.00	96.40 %
18-A021985	Total Nitrogen (TKN)	mg/l	0.374	1.19	1.00	81.60 %
18-A022454	Total Nitrogen (TKN)	mg/l	< 0.1	1.07	1.00	107.00 %
18-A022458	Total Nitrogen (TKN)	mg/l	< 0.1	1.12	1.00	112.00 %
18-A021557	Total Nitrate + Nitrite	mg/l	0.32	1.3	1.0	98.00 %
18-A021586	Total Nitrate + Nitrite	mg/l	1.0	2.0	1.0	100.00 %
18-A021602	Total Nitrate + Nitrite	mg/l	0.81	1.8	1.0	99.00 %
18-A021790	Total Nitrate + Nitrite	mg/l	0.23	1.2	1.0	97.00 %
18-A021839	Total Nitrate + Nitrite	mg/l	0.036	1.1	1.0	106.40 %
18-A021858	Total Nitrate + Nitrite	mg/l	0.28	1.3	1.0	102.00 %
18-A021937	Total Nitrate + Nitrite	mg/l	0.24	1.3	1.0	106.00 %
18-A021973	Total Nitrate + Nitrite	mg/l	0.30	1.3	1.0	100.00 %
18-A021983	Total Nitrate + Nitrite	mg/l	0.22	1.2	1.0	98.00 %

QC Summary for sample numbers: 18-A21784 to 18-A21798...

MATRIX SPIKES continued....

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A022051	Total Nitrate + Nitrite	mg/l	0.49	1.5	1.0	101.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.01	101. %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	0.960	96.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.951	95.1 %
Total Nitrogen (TKN)	mg/l	1.00	0.998	99.8 %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-088

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20181209 21784	12/9/18	16:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20181209 85	12/9/18	14:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20181209 86	12/9/18	14:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20181209 87	12/9/18	14:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20181209 88	12/9/18	15:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20181209 89	12/9/18	15:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20181209 90	12/9/18	15:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20181209 91	12/9/18	16:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20181209 92	12/9/18	15:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20181209 93	12/9/18	16:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env.	12/10/18	11:50	
Received by:	AMTEST T = 5.1	12/10/18	11:50	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CLIENT

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-088

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20181209 21794	12/9/18	14:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20181209 95	12/9/18	14:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20181209 96	12/9/18	15:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMC-20181209 97	12/9/18	15:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA57-20181209 98	12/9/18	14:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	Onsite Env	12/10/18	11:50	
Received by:	AMTEST T=5.1	12/10/18	11:50	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CLIENT

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Laboratory No. 12-088

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1209	12-9-18	1620	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1209		1425	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1209		1410	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1209		14:40	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1209		1500	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1209		1540	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1209		1550	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1209		16:50	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1209		15:45	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1209		16:30	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1209		14:00	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1209		1435	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1209		1500	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1209		1515	Water	7	X	X	X	X	X	X	X	X	X			
15	QA57-20181209 *	↓	14:15	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by M Mullen Date 12.9.18 Received by _____ Date 12/9/18
Firm Herrera Environmental Time 17:20 Firm OnSite Env Time 1720

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample
* QA57 bottle labels: QA -20181209
↳ 57 is missing bag says "QA57"

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Name: Redmond Paired Watershed Study
Manager: George Ifner

Turnaround Requested:
____ 1 Day
____ 2 Day
____ 3 Day
__X__ Standard

Page 1 of 1

Laboratory No.

Requested Analyses

Lab	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181 1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *
1	COLM-2018 1209	12.9.18	1620	Water	7	X	X	X	X	X	X	X	X	X
2	COUMI-2018 1209		1425	Water	7	X	X	X	X	X	X	X	X	X
3	COUMO-2018 1209		1410	Water	7	X	X	X	X	X	X	X	X	X
4	EVAMS-2018 1209		1440	Water	7	X	X	X	X	X	X	X	X	X
5	EVALSS-2018 1209		1500	Water	7	X	X	X	X	X	X	X	X	X
6	MONMN-2018 1209		1540	Water	7	X	X	X	X	X	X	X	X	X
7	MONMS-2018 1209		1550	Water	7	X	X	X	X	X	X	X	X	X
8	MONM-2018 1209		1650	Water	7	X	X	X	X	X	X	X	X	X
9	SEIMN-2018 1209		1545	Water	7	X	X	X	X	X	X	X	X	X
10	SEIMS-2018 1209		1630	Water	7	X	X	X	X	X	X	X	X	X
11	TOSMI-2018 1209		1400	Water	7	X	X	X	X	X	X	X	X	X
12	TOSMO-2018 1209		1435	Water	7	X	X	X	X	X	X	X	X	X
13	TYLMI-2018 1209		1500	Water	7	X	X	X	X	X	X	X	X	X
14	TYLMO-2018 1209		1515	Water	7	X	X	X	X	X	X	X	X	X
15	A57-Rep 20181209	*	1415	Water	7	X	X	X	X	X	X	X	X	X

Relinquished by: M Mullen Date: 12.9.18
Firm: Herrera Environmental Time: 1720

Received by: Date: 12/9/18
Firm: OnSite Env Time: 1720

Relinquished by: Date:
Firm: Date:

Received by: Date:

Comments:
* - field filtered with 0.45 µm filter with minutes of collecting sample
* @A57 bottle label
QA - 20181209

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	~~YSI~~ 951 Pro DSS #1
Date/Time:	12.9.18 13:15
Barometric Pressure Start of Day:	mmHg: 761.8 Time: 13:15
Barometric Pressure End of Day:	mmHg: 764.7 Time: 8:45 (12.10.18)

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.7	0	21.1	Herrera DI water
Conductivity (µS/cm)	1019	1,000	20.5	did not calibrate
Conductivity (µS/cm)	101.6	100	20.7	calibrated new value - 100.0
DO % Saturation	101.5	100	19.8	calibrated new value: 100.3

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.9	0	20.2	Herrera DI water
Conductivity (µS/cm)	99.5	100	20.9	
DO % Saturation	101.6	100	20.0	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	YSI Pro DSS #2
Date/Time:	12.9.18 13:15
Barometric Pressure Start of Day:	mmHg: 782.1 Time: 13:15
Barometric Pressure End of Day:	mmHg: 765.1 Time: 8:45 (12.10.18)

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.4	0	21.7	Herrera DI water
Conductivity (µS/cm)	1017	1,000	21.1	did not calibrate
Conductivity (µS/cm)	102.6	100	20.9	calibrated new value: 100.0
DO % Saturation	100.7	100	20.0	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.1	0	21.6	Herrera DI water
Conductivity (µS/cm)	99.0	100	21.1	
DO % Saturation	101.2	100	20.7	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GF + VW

Sample Date: 12/9/18 Sample Time: 14:25 PDT: X

Base Flow or Storm Event? Field Filtered Time: 14:30 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F Rain

Water Quality Sampling

Sample ID: COUM120181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Esha Lenth Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.72

Reference Point (description): Staff gage

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 170.0

Dissolved Oxygen (mg/L) 11.97

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK - VW

Sample Date: 12/9/2018 Sample Time: 14:10 PDT: X PST:

Base Flow or Storm Event?

Field Filtered Time: 14:15 (Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 43°F + Rain

Water Quality Sampling

Sample ID: COUMO20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: -

Filter blank sample ID: -

Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: light turbidity

Color: light brown/grey

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Robin Lamb Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.45

Reference Point (description): Staff gage

Water Quality Measurments

Temperature (°C) 7.3

Specific Conductivity (µs/cm) 168.3

Dissolved Oxygen (mg/L) 11.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + KB

Sample Date: 12.9.18 **Sample Time:** 14:40 PDT: PST: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 14:45
(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: EVAMS-20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —
Filter blank sample ID:
Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear
Color: NA
Odor: NA
Sheen: NA
Floatables: foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zhu Lenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1 ✓
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.92

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 0.2

Specific Conductivity (µs/cm) 199.1

Dissolved Oxygen (mg/L) 12.05

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + KB

Sample Date: 12.9.18 **Sample Time:** 15:00 PDT

Base Flow or Storm Event? **Field Filtered Time:** 15:05 PST X

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: EVALSS-~~120~~ 2018 1209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	No
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: some turbidity

Color: mostly clear

Odor: None

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.36

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) ~~328~~ 6.5

Specific Conductivity (µs/cm) ~~@~~ 186.2

Dissolved Oxygen (mg/L) 12.32

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK VW

Sample Date: 12.9.18 Sample Time: 15:40 PDT X PST

Base Flow or Storm Event?

Field Filtered Time: 15:45 (Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 42°F Rain

Water Quality Sampling

Sample ID: MONMN 20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: Clear

Color: none

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Tom Leuthold Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Assume 9.24 MM

Stream Stage (ft): 0.24

Reference Point (description): #4 SG

Water Quality Measurments

Temperature (°C) 6.0

Specific Conductivity (µs/cm) 174.6

Dissolved Oxygen (mg/L) 11.86

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK VW

Sample Date: 12.9.18 Sample Time: 15:50 PDT: X

Base Flow or Storm Event? Field Filtered Time: 15:55 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 42° F + Rain

Water Quality Sampling

Sample ID: MONMS 20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	No
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: -

Filter blank sample ID: -

Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: biological

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Sarah Leath Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.65

Reference Point (description): Water level indicator

Water Quality Measurments

Temperature (°C) 6.3

Specific Conductivity (µs/cm) 371.6

Dissolved Oxygen (mg/L) 9.81

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK VW

Sample Date: 12.9.18 Sample Time: 16:50 PDT: X

Base Flow or Storm Event? Field Filtered Time: 16:55 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 43°F + Rain

Water Quality Sampling

Sample ID: MONM20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: no

Sheen: no

Floatables: bubbles below weir.

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Erin Leath Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

Reference Point (description): N/A

Water Quality Measurments

Temperature (°C) 6.5

Specific Conductivity (µs/cm) 229.9

Dissolved Oxygen (mg/L) 12.33

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM KB

Sample Date: 12.9.18 Sample Time: 15:45 PDT

Base Flow or Storm Event? Field Filtered Time: 15:50 PST X

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: SEIMN 20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Ladd Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.64

Reference Point (description): from top of bolts

Water Quality Measurments

Temperature (°C) 5.8

Specific Conductivity (µs/cm) 78.9

Dissolved Oxygen (mg/L) 12.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK VW

Sample Date: 12·9·18 **Sample Time:** 16·30 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 16·35 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 46°F light rain

Water Quality Sampling

Sample ID: SEIMS 20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	light turbidity
Color:	Brown
Odor:	no
Sheen:	no
Floatables:	bubbles

LABORATORY DELIVERY.

Date: **Time:**

Quality Assurance

Checked By: John Leuth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.86

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.7

Specific Conductivity (µs/cm) 103.5

Dissolved Oxygen (mg/L) 12.00

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen K Bliss QA

Sample Date: 12.9.18 **Sample Time:** 14:00 | 14:15 PDT

Base Flow or Storm Event? X **Field Filtered Time:** 14:05 | 14:20 PST x

(Must filter within 15 minutes of collection)

SITE ID: TOSM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: TOSM12018 1209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA57 2018 1209

Filter blank sample ID: 11

Transfer blank sample ID: NA

Visual and Olfactory Conditions:

- Clarity: turbid
- Color: brown
- Odor: none
- Sheen: none
- Floatables: some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Silvia Lenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.02

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.2

Specific Conductivity (µs/cm) 124.2

Dissolved Oxygen (mg/L) 12.00

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK - VW

Sample Date: 12.9.18 **Sample Time:** 14:35 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 14:40 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 43°F rain

Water Quality Sampling

Sample ID: TOSM020818209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	brown
Odor:	no
Sheen:	no
Floatables:	foam below weir

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Silvia Lorch **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.77

Reference Point (description): staff gage

Water Quality Measurments

Temperature (°C) 7.4

Specific Conductivity (µs/cm) 140.0

Dissolved Oxygen (mg/L) 12.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK VW

Sample Date: 12/9/18 Sample Time: 15:00 PDT X PST

Base Flow or Storm Event?

Field Filtered Time: 15:05 (Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 43° F + Rain

Water Quality Sampling

Sample ID: TYLM120181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: Clear

Color: none

Odor: no

Sheen: no

Floatables: some foam

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Sara Leuth Signature:

Date Checked: 1-14-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.43

Reference Point (description): top of culvert downhill

Water Quality Measurments

Temperature (°C) 7.6

Specific Conductivity (µs/cm) 150.4

Dissolved Oxygen (mg/L) 11.18

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + KB

Sample Date: 12.9.18 **Sample Time:** 16:20 PDT: X

Base Flow or Storm Event? B **Field Filtered Time:** 16:25 PST:

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40°

Water Quality Sampling

Sample ID: COLM 20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	ND
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: some turbidity

Color: none

Odor: none

Sheen: none

Floatables: some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sonja Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **Initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.62

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 3.8

Specific Conductivity (µs/cm) 39.3

Dissolved Oxygen (mg/L) 11.85

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + VW

Sample Date: 12/9/18 **Sample Time:** 15:15 PDT X PST

Base Flow or Storm Event? (Storm Event circled)

Field Filtered Time: 15:20 (Must filter within 15 minutes of collection)

SITE ID: TYLMD

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F + Rain

Water Quality Sampling

Sample ID: TYLMD 20181209

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	light turbidity
Color:	light brown
Odor:	no
Sheen:	no
Floatables:	no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.68

Reference Point (description): top of culvert downstream

Water Quality Measurments

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 102.9

Dissolved Oxygen (mg/L) 12.01

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/4/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/09/2018 / All locations, QA57 (TOSMI) Lab Ref No 1812-088

date 1/14/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	4	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	95	**±20**	38	**≤ 25**	16	**≤ 25**	OK	J TOSMI DUE TO LAB DUP RPD.
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	5	**≤ 25**	6.9	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	8	**≤180**	≤1.0 mg/L 1.0 mg/L	93,93	**±25**	93	**±15**	NC,0	**≤ 20**	2.5	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	4	**≤28**	≤1.0 mg/L 1.0 mg/L	109	**±25**	98	**±15**	2	**≤ 20**	D=0.1	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	8	**≤28**	≤0.01 mg/L 0.01 mg/L	95	**±25**	98	**±20**	12	**≤ 20**	7.4	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	3-12 5	**≤28**	≤0.1 mg/L 0.1 mg/L	97	**±25**	95-104	**±20**	4.4	**≤ 20**	1.2 0	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/4/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/09/2018 / All locations, QA57 (TOSMI) Lab Ref No 1812-088

date 1/14/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	2-3	**≤180**	≤1.0 µg/L 1.0 µg/L	101,99	**±25**	NR	**±15**	NC, 2	**≤ 20**	16	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	2-3	**≤180**	≤5.0 µg/L 5.0 µg/L	103,101	**±25**	NR	**±15**	NC, 2	**≤ 20**	15	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	2-3	**≤180**	≤1.0 µg/L 1.0 µg/L	95,92	**±25**	NR	**±15**	5,3	**≤ 20**	2.8	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	2-3	**≤180**	≤5.0 µg/L 5.0 µg/L	97,95	**±25**	NR	**±15**	5,1	**≤ 20**	D=41	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	0, 8.7	**≤ 35**	37	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

January 3, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1812-108

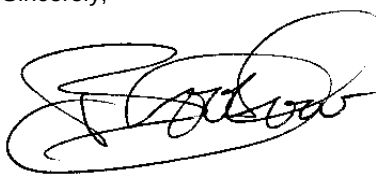
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on December 11, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

Case Narrative

Samples were collected on December 11, 2018 and received by the laboratory on December 11, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181211**					
Laboratory ID:	12-108-01					
Total Suspended Solids	**1.6**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**COUMI-20181211**					
Laboratory ID:	12-108-02					
Total Suspended Solids	**42**	1.4	SM 2540D	12-12-48	12-13-18	
Client ID:	**COUMO-20181211**					
Laboratory ID:	12-108-03					
Total Suspended Solids	**24**	1.4	SM 2540D	12-12-48	12-13-18	
Client ID:	**EVAMS-20181211**					
Laboratory ID:	12-108-04					
Total Suspended Solids	**6.2**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**EVALSS-20181211**					
Laboratory ID:	12-108-05					
Total Suspended Solids	**14**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**MONMN-20181211**					
Laboratory ID:	12-108-06					
Total Suspended Solids	**11**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**MONMS-20181211**					
Laboratory ID:	12-108-07					
Total Suspended Solids	**2.6**	1.0	SM 2540D	12-12-48	12-13-18	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181211**					
Laboratory ID:	12-108-08					
Total Suspended Solids	**11**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**SEIMN-20181211**					
Laboratory ID:	12-108-09					
Total Suspended Solids	**18**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**SEIMS-20181211**					
Laboratory ID:	12-108-10					
Total Suspended Solids	**5.4**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**TOSMI-20181211**					
Laboratory ID:	12-108-11					
Total Suspended Solids	**32**	1.4	SM 2540D	12-12-48	12-13-18	
Client ID:	**TOSMO-20181211**					
Laboratory ID:	12-108-12					
Total Suspended Solids	**76**	2.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**TYLMI-20181211**					
Laboratory ID:	12-108-13					
Total Suspended Solids	**9.2**	1.0	SM 2540D	12-12-48	12-13-18	
Client ID:	**TYLMO-20181211**					
Laboratory ID:	12-108-14					
Total Suspended Solids	**25**	1.0	SM 2540D	12-12-48	12-13-18	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA58-20181211**					
Laboratory ID:	12-108-15					
Total Suspended Solids	**6.4**	1.0	SM 2540D	12-12-48	12-13-18	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1212W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	12-12-48	12-13-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-108-12								
	ORIG	DUP							
Total Suspended Solids	**75.6**	**68.8**	NA	NA	NA	NA	9	22	
SPIKE BLANK									
Laboratory ID:	SB1212W2								
	SB		SB		SB				
Total Suspended Solids	**98.0**		100	NA	98	76-114	NA	NA	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181211**					
Laboratory ID:	12-108-01					
Turbidity	**0.61**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**COUMI-20181211**					
Laboratory ID:	12-108-02					
Turbidity	**18**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**COUMO-20181211**					
Laboratory ID:	12-108-03					
Turbidity	**14**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**EVAMS-20181211**					
Laboratory ID:	12-108-04					
Turbidity	**2.9**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**EVALSS-20181211**					
Laboratory ID:	12-108-05					
Turbidity	**4.7**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**MONMN-20181211**					
Laboratory ID:	12-108-06					
Turbidity	**8.8**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**MONMS-20181211**					
Laboratory ID:	12-108-07					
Turbidity	**2.5**	0.10	EPA 180.1	12-12-18	12-12-18	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181211**					
Laboratory ID:	12-108-08					
Turbidity	**6.5**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**SEIMN-20181211**					
Laboratory ID:	12-108-09					
Turbidity	**7.8**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**SEIMS-20181211**					
Laboratory ID:	12-108-10					
Turbidity	**2.4**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**TOSMI-20181211**					
Laboratory ID:	12-108-11					
Turbidity	**14**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**TOSMO-20181211**					
Laboratory ID:	12-108-12					
Turbidity	**28**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**TYLMI-20181211**					
Laboratory ID:	12-108-13					
Turbidity	**6.1**	0.10	EPA 180.1	12-12-18	12-12-18	
Client ID:	**TYLMO-20181211**					
Laboratory ID:	12-108-14					
Turbidity	**13**	0.10	EPA 180.1	12-12-18	12-12-18	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA58-20181211**					
Laboratory ID:	12-108-15					
Turbidity	**3.2**	0.10	EPA 180.1	12-12-18	12-12-18	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1212W1					
Turbidity	**ND**	0.10	EPA 180.1	12-12-18	12-12-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-108-14								
	ORIG	DUP							
Turbidity	**13.2**	**13.7**	NA	NA	NA	NA	4	15	

Date of Report: January 3, 2019
Samples Submitted: December 11, 2018
Laboratory Reference: 1812-108
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181211**					
Laboratory ID:	12-108-01					
Hardness	**13**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**COUMI-20181211**					
Laboratory ID:	12-108-02					
Hardness	**69**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**COUMO-20181211**					
Laboratory ID:	12-108-03					
Hardness	**48**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**EVAMS-20181211**					
Laboratory ID:	12-108-04					
Hardness	**74**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**EVALSS-20181211**					
Laboratory ID:	12-108-05					
Hardness	**71**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**MONMN-20181211**					
Laboratory ID:	12-108-06					
Hardness	**48**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**MONMS-20181211**					
Laboratory ID:	12-108-07					
Hardness	**83**	1.0	200.7/SM 2340B	12-14-18	12-14-18	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181211**					
Laboratory ID:	12-108-08					
Hardness	**61**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**SEIMN-20181211**					
Laboratory ID:	12-108-09					
Hardness	**27**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**SEIMS-20181211**					
Laboratory ID:	12-108-10					
Hardness	**40**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**TOSMI-20181211**					
Laboratory ID:	12-108-11					
Hardness	**29**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**TOSMO-20181211**					
Laboratory ID:	12-108-12					
Hardness	**44**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**TYLMI-20181211**					
Laboratory ID:	12-108-13					
Hardness	**35**	1.0	200.7/SM 2340B	12-14-18	12-14-18	
Client ID:	**TYLMO-20181211**					
Laboratory ID:	12-108-14					
Hardness	**28**	1.0	200.7/SM 2340B	12-14-18	12-14-18	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA58-20181211**					
Laboratory ID:	12-108-15					
Hardness	**41**	1.0	200.7/SM 2340B	12-14-18	12-14-18	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1214WH3					
Hardness	**ND**	1.0	200.7/SM 2340B	12-14-18	12-14-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-108-01										
	ORIG	DUP									
Hardness	**12.8**	**12.5**	NA		NA	NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	12-108-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**137**	**137**	132	132	12.8	94	94	75-125	0	20	
SPIKE BLANK											
Laboratory ID:	SB1214WH3										
	SB		SB			SB					
Hardness	**128**		132		NA	97		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181211**					
Laboratory ID:	12-108-01					
Dissolved Organic Carbon	**17**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**COUMI-20181211**					
Laboratory ID:	12-108-02					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**COUMO-20181211**					
Laboratory ID:	12-108-03					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**EVAMS-20181211**					
Laboratory ID:	12-108-04					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**EVALSS-20181211**					
Laboratory ID:	12-108-05					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**MONMN-20181211**					
Laboratory ID:	12-108-06					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**MONMS-20181211**					
Laboratory ID:	12-108-07					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	12-13-18	12-13-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181211**					
Laboratory ID:	12-108-08					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**SEIMN-20181211**					
Laboratory ID:	12-108-09					
Dissolved Organic Carbon	**7.3**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**SEIMS-20181211**					
Laboratory ID:	12-108-10					
Dissolved Organic Carbon	**7.3**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TOSMI-20181211**					
Laboratory ID:	12-108-11					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TOSMO-20181211**					
Laboratory ID:	12-108-12					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TYLMI-20181211**					
Laboratory ID:	12-108-13					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	12-13-18	12-13-18	
Client ID:	**TYLMO-20181211**					
Laboratory ID:	12-108-14					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	12-13-18	12-13-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA58-20181211**					
Laboratory ID:	12-108-15					
Dissolved Organic Carbon	**7.5**	1.0	SM 5310B	12-13-18	12-13-18	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1213D2					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	12-13-18	12-13-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-108-01								
	ORIG	DUP							
Dissolved Organic Carbon	**16.7**	**16.7**	NA	NA	NA	NA	0	15	
MATRIX SPIKE									
Laboratory ID:	12-108-01								
	MS		MS		MS				
Dissolved Organic Carbon	**27.1**		10.0	16.7	104	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1213D2								
	SB		SB		SB				
Dissolved Organic Carbon	**9.47**		10.0	NA	95	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181211**					
Laboratory ID:	12-108-01					
Total Phosphorus	**0.019**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**COUMI-20181211**					
Laboratory ID:	12-108-02					
Total Phosphorus	**0.13**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**COUMO-20181211**					
Laboratory ID:	12-108-03					
Total Phosphorus	**0.097**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**EVAMS-20181211**					
Laboratory ID:	12-108-04					
Total Phosphorus	**0.025**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**EVALSS-20181211**					
Laboratory ID:	12-108-05					
Total Phosphorus	**0.045**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**MONMN-20181211**					
Laboratory ID:	12-108-06					
Total Phosphorus	**0.048**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**MONMS-20181211**					
Laboratory ID:	12-108-07					
Total Phosphorus	**0.031**	0.010	EPA 365.1	12-17-18	12-17-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181211**					
Laboratory ID:	12-108-08					
Total Phosphorus	**0.051**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**SEIMN-20181211**					
Laboratory ID:	12-108-09					
Total Phosphorus	**0.058**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**SEIMS-20181211**					
Laboratory ID:	12-108-10					
Total Phosphorus	**0.043**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**TOSMI-20181211**					
Laboratory ID:	12-108-11					
Total Phosphorus	**0.064**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**TOSMO-20181211**					
Laboratory ID:	12-108-12					
Total Phosphorus	**0.12**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**TYLMI-20181211**					
Laboratory ID:	12-108-13					
Total Phosphorus	**0.048**	0.010	EPA 365.1	12-17-18	12-17-18	
Client ID:	**TYLMO-20181211**					
Laboratory ID:	12-108-14					
Total Phosphorus	**0.067**	0.010	EPA 365.1	12-17-18	12-17-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA58-20181211**					
Laboratory ID:	12-108-15					
Total Phosphorus	**0.045**	0.010	EPA 365.1	12-17-18	12-17-18	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1217W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	12-17-18	12-17-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-108-01								
	ORIG	DUP							
Total Phosphorus	**0.0193**	**0.0192**	NA	NA	NA	NA	1	12	
MATRIX SPIKE									
Laboratory ID:	12-108-01								
	MS		MS		MS				
Total Phosphorus	**0.243**		0.250	0.0193	89	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1217W1								
	SB		SB		SB				
Total Phosphorus	**0.240**		0.250	NA	96	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181211**					
Laboratory ID:	12-108-01					
Copper	**ND**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**COUMI-20181211**					
Laboratory ID:	12-108-02					
Copper	**3.1**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**74**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**COUMO-20181211**					
Laboratory ID:	12-108-03					
Copper	**4.3**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**47**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**EVAMS-20181211**					
Laboratory ID:	12-108-04					
Copper	**ND**	1.0	EPA 200.8	12-14-18	12-14-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-14-18	
Client ID:	**EVALSS-20181211**					
Laboratory ID:	12-108-05					
Copper	**ND**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**MONMN-20181211**					
Laboratory ID:	12-108-06					
Copper	**1.5**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**13**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**MONMS-20181211**					
Laboratory ID:	12-108-07					
Copper	**1.7**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-18-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181211**					
Laboratory ID:	12-108-08					
Copper	**1.5**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**18**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**SEIMN-20181211**					
Laboratory ID:	12-108-09					
Copper	**1.2**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**SEIMS-20181211**					
Laboratory ID:	12-108-10					
Copper	**ND**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**TOSMI-20181211**					
Laboratory ID:	12-108-11					
Copper	**5.0**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**45**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**TOSMO-20181211**					
Laboratory ID:	12-108-12					
Copper	**5.1**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**40**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**TYLMI-20181211**					
Laboratory ID:	12-108-13					
Copper	**3.8**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**9.3**	5.0	EPA 200.8	12-14-18	12-18-18	
Client ID:	**TYLMO-20181211**					
Laboratory ID:	12-108-14					
Copper	**4.3**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**130**	5.0	EPA 200.8	12-14-18	12-18-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA58-20181211**					
Laboratory ID:	12-108-15					
Copper	**ND**	1.0	EPA 200.8	12-14-18	12-18-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-18-18	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1214WH1					
Copper	**ND**	1.0	EPA 200.8	12-14-18	12-14-18	
Zinc	**ND**	5.0	EPA 200.8	12-14-18	12-14-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-108-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	12-108-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**87.6**	**88.8**	100	100	ND	**88**	**89**	75-125	1	20	
Zinc	**102**	**105**	100	100	ND	**102**	**105**	75-125	3	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181211**					
Laboratory ID:	12-108-01					
Copper	**ND**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	
Client ID:	**COUMI-20181211**					
Laboratory ID:	12-108-02					
Copper	**1.4**	1.0	EPA 200.8		12-18-18	
Zinc	**28**	5.0	EPA 200.8		12-18-18	
Client ID:	**COUMO-20181211**					
Laboratory ID:	12-108-03					
Copper	**1.9**	1.0	EPA 200.8		12-18-18	
Zinc	**20**	5.0	EPA 200.8		12-18-18	
Client ID:	**EVAMS-20181211**					
Laboratory ID:	12-108-04					
Copper	**ND**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	
Client ID:	**EVALSS-20181211**					
Laboratory ID:	12-108-05					
Copper	**ND**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	
Client ID:	**MONMN-20181211**					
Laboratory ID:	12-108-06					
Copper	**1.2**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	
Client ID:	**MONMS-20181211**					
Laboratory ID:	12-108-07					
Copper	**1.6**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181211**					
Laboratory ID:	12-108-08					
Copper	**1.2**	1.0	EPA 200.8		12-18-18	
Zinc	**10**	5.0	EPA 200.8		12-18-18	
Client ID:	**SEIMN-20181211**					
Laboratory ID:	12-108-09					
Copper	**ND**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	
Client ID:	**SEIMS-20181211**					
Laboratory ID:	12-108-10					
Copper	**ND**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	
Client ID:	**TOSMI-20181211**					
Laboratory ID:	12-108-11					
Copper	**2.9**	1.0	EPA 200.8		12-18-18	
Zinc	**24**	5.0	EPA 200.8		12-18-18	
Client ID:	**TOSMO-20181211**					
Laboratory ID:	12-108-12					
Copper	**2.4**	1.0	EPA 200.8		12-18-18	
Zinc	**8.1**	5.0	EPA 200.8		12-18-18	
Client ID:	**TYLMI-20181211**					
Laboratory ID:	12-108-13					
Copper	**3.0**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	
Client ID:	**TYLMO-20181211**					
Laboratory ID:	12-108-14					
Copper	**2.4**	1.0	EPA 200.8		12-18-18	
Zinc	**93**	5.0	EPA 200.8		12-18-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA58-20181211**					
Laboratory ID:	12-108-15					
Copper	**ND**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	

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DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1218D1					
Copper	**ND**	1.0	EPA 200.8		12-18-18	
Zinc	**ND**	5.0	EPA 200.8		12-18-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-108-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	12-108-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**69.2**	**74.0**	100	100	ND	**69**	**74**	75-125	7	20	
Zinc	**82.6**	**85.6**	100	100	ND	**83**	**86**	75-125	4	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 3 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181211	Water	18-A21971	Micro, NUT
COUMI-20181211	Water	18-A21972	Micro, NUT
COUMO-20181211	Water	18-A21973	Micro, NUT
EVAMS-20181211	Water	18-A21974	Micro, NUT
EVALSS-20181211	Water	18-A21975	Micro, NUT
MONMN-20181211	Water	18-A21976	Micro, NUT
MONMS-20181211	Water	18-A21977	Micro, NUT
MONM-20181211	Water	18-A21978	Micro, NUT
SEIMN-20181211	Water	18-A21979	Micro, NUT
SEIMS-20181211	Water	18-A21980	Micro, NUT
TOSMI-20181211	Water	18-A21981	Micro, NUT
TOSMO-20181211	Water	18-A21982	Micro, NUT
TYLMI-20181211	Water	18-A21983	Micro, NUT
TYLMO-20181211	Water	18-A21984	Micro, NUT
QA58-20181211	Water	18-A21985	Micro, NUT

Your samples were received on Wednesday, December 12, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
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Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 3 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 12-108

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 12-108
All results reported on an as received basis.

Date Received: 12/12/18
Date Reported: 1/ 3/19

AMTEST Identification Number **18-A21971**
Client Identification **COLM-20181211**
Sampling Date **12/11/18, 15:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	25.	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.58	mg/l		0.1			
Total Nitrogen (TKN)	0.475	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.10	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21972**
Client Identification **COUMI-20181211**
Sampling Date **12/11/18, 13:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	260	CFU/100 ml		20	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.67	mg/l		0.1			
Total Nitrogen (TKN)	0.452	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.22	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21973**
Client Identification **COUMO-20181211**
Sampling Date **12/11/18, 14:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	380	CFU/100 ml		20	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.72	mg/l		0.1			
Total Nitrogen (TKN)	0.417	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.30	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21974**
Client Identification **EVAMS-20181211**
Sampling Date **12/11/18, 13:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	9.	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	2.37	mg/l		0.1			
Total Nitrogen (TKN)	0.868	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	1.5	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21975**
Client Identification **EVALSS-20181211**
Sampling Date **12/11/18, 13:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	1.81	mg/l		0.1			
Total Nitrogen (TKN)	0.414	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	1.4	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21976**
Client Identification **MONMN-20181211**
Sampling Date **12/11/18, 15:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	35.	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.59	mg/l		0.1			
Total Nitrogen (TKN)	0.327	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.26	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21977**
Client Identification **MONMS-20181211**
Sampling Date **12/11/18, 15:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.52	mg/l		0.1			
Total Nitrogen (TKN)	0.306	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.21	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21978**
Client Identification **MONM-20181211**
Sampling Date **12/11/18, 16:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.362	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.26	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21979**
Client Identification **SEIMN-20181211**
Sampling Date **12/11/18, 14:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	29.	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.359	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.14	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21980**
Client Identification **SEIMS-20181211**
Sampling Date **12/11/18, 16:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	44.	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.423	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.21	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21981**
Client Identification **TOSMI-20181211**
Sampling Date **12/11/18, 13:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1800	CFU/100 ml		20	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.440	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.30	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21982**
Client Identification **TOSMO-20181211**
Sampling Date **12/11/18, 13:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.77	mg/l		0.1			
Total Nitrogen (TKN)	0.468	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.30	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21983**
Client Identification **TYLMI-20181211**
Sampling Date **12/11/18, 14:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	66.	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.59	mg/l		0.1			
Total Nitrogen (TKN)	0.372	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.22	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21984**
Client Identification **TYLMO-20181211**
Sampling Date **12/11/18, 14:10**

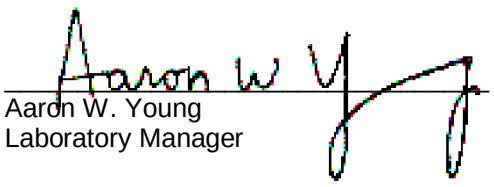
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	600	CFU/100 ml		20	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.58	mg/l		0.1			
Total Nitrogen (TKN)	0.396	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.18	mg/l		0.01	SM4500NO3	JC	12/14/18

AMTEST Identification Number **18-A21985**
Client Identification **QA58-20181211**
Sampling Date **12/11/18, 16:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	35.	CFU/100 ml		2	SM 9222D	JM	12/12/18
Total Nitrogen (NOX&TKN)	0.57	mg/l		0.1			
Total Nitrogen (TKN)	0.374	mg/l		0.1	SM4500N	JC	12/31/18
Total Nitrate + Nitrite	0.20	mg/l		0.01	SM4500NO3	JC	12/14/18



Aaron W. Young
Laboratory Manager

Am Test Inc.
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Professional Analytical Services

QC Summary for sample numbers: 18-A21971 to 18-A21985

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A021971	Fecal coliform	CFU/100 ml	25.	24.	4.1
18-A021985	Fecal coliform	CFU/100 ml	35.	27.	26.
18-A021837	Total Nitrogen (TKN)	mg/l	0.803	0.856	6.4
18-A021977	Total Nitrogen (TKN)	mg/l	0.306	0.350	13.
18-A021985	Total Nitrogen (TKN)	mg/l	0.374	0.371	0.81
18-A022454	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A022458	Total Nitrogen (TKN)	mg/l	< 0.1	< 0.1	
18-A021557	Total Nitrate + Nitrite	mg/l	0.32	0.30	6.5
18-A021586	Total Nitrate + Nitrite	mg/l	1.0	0.99	1.0
18-A021602	Total Nitrate + Nitrite	mg/l	0.81	0.82	1.2
18-A021790	Total Nitrate + Nitrite	mg/l	0.23	0.22	4.4
18-A021839	Total Nitrate + Nitrite	mg/l	0.036	0.033	8.7
18-A021858	Total Nitrate + Nitrite	mg/l	0.28	0.28	0.00
18-A021937	Total Nitrate + Nitrite	mg/l	0.24	0.24	0.00
18-A021973	Total Nitrate + Nitrite	mg/l	0.30	0.31	3.3
18-A021983	Total Nitrate + Nitrite	mg/l	0.22	0.22	0.00
18-A022051	Total Nitrate + Nitrite	mg/l	0.49	0.51	4.0

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A021837	Total Nitrogen (TKN)	mg/l	0.803	1.77	1.00	96.70 %
18-A021977	Total Nitrogen (TKN)	mg/l	0.306	1.27	1.00	96.40 %
18-A021985	Total Nitrogen (TKN)	mg/l	0.374	1.19	1.00	81.60 %
18-A022454	Total Nitrogen (TKN)	mg/l	< 0.1	1.07	1.00	107.00 %
18-A022458	Total Nitrogen (TKN)	mg/l	< 0.1	1.12	1.00	112.00 %
18-A021557	Total Nitrate + Nitrite	mg/l	0.32	1.3	1.0	98.00 %
18-A021586	Total Nitrate + Nitrite	mg/l	1.0	2.0	1.0	100.00 %
18-A021602	Total Nitrate + Nitrite	mg/l	0.81	1.8	1.0	99.00 %
18-A021790	Total Nitrate + Nitrite	mg/l	0.23	1.2	1.0	97.00 %
18-A021839	Total Nitrate + Nitrite	mg/l	0.036	1.1	1.0	106.40 %
18-A021858	Total Nitrate + Nitrite	mg/l	0.28	1.3	1.0	102.00 %
18-A021937	Total Nitrate + Nitrite	mg/l	0.24	1.3	1.0	106.00 %
18-A021973	Total Nitrate + Nitrite	mg/l	0.30	1.3	1.0	100.00 %
18-A021983	Total Nitrate + Nitrite	mg/l	0.22	1.2	1.0	98.00 %
18-A022051	Total Nitrate + Nitrite	mg/l	0.49	1.5	1.0	101.00 %

QC Summary for sample numbers: 18-A21971 to 18-A21985...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.960	96.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.951	95.1 %
Total Nitrogen (TKN)	mg/l	1.00	0.998	99.8 %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-108

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
21971	COLM-20181211	12/11/18	15:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
72	COUMI-20181211	12/11/18	13:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
73	COUMO-20181211	12/11/18	14:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
74	EVAMS-20181211	12/11/18	13:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
75	EVALSS-20181211	12/11/18	13:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
76	MONMN-20181211	12/11/18	15:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
77	MONMS-20181211	12/11/18	15:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
78	MONM-20181211	12/11/18	16:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
79	SEIMN-20181211	12/11/18	14:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
80	SEIMS-20181211	12/11/18	16:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env.	12/12/18	7:10	
Received by:		12/12/18	7:10	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				6.2°

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-108

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
21 9811	TOSMI-20181211	12/11/18	13:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
812	TOSMC-20181211	12/11/18	13:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
813	TYLMI-20181211	12/11/18	14:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
814	TYLMO-20181211	12/11/18	14:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
815	QA58-20181211	12/11/18	16:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	12/12/18	710	
Received by: MF		12/12/18	710	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				6.2

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Laboratory No. 12-108

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1211	12/11/18	15:10	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1211		13:25	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1211		14:00	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1211		13:25	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1211		13:40	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1211		15:20	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1211		15:40	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1211		16:05	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1211		14:30	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1211		16:00	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1211		13:00	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1211		13:45	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1211		14:50	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1211		14:10	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 58-20181211		16:10	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 12.11.18 Received by _____ Date 12/11/18
Firm Herrera Environmental Time 16:35 Firm OSE Time 1635

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No.

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
	COLM-2018 1217	121718	19:40	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2018 1217		17:30	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2018 1217		17:05	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2018 1217		17:35	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2018 1217		17:50	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2018 1217		19:30	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2018 1217		19:55	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2018 1217		20:30	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2018 1217		19:00	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2018 1217		20:30	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2018 1217		16:50	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2018 1217		18:00	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2018 1217		19:00	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2018 1217		18:40	Water	7	X	X	X	X	X	X	X	X	X			
	QA 59-2018 1217	↓	17:40	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 12.18.18 Received by [signature] Date 12/19/18
Firm Herrera Time 10:20AM Firm AQUA Time 11:20AM
RB

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	YSI Pro DSS #2
Date/Time:	12.17.18 16:00
Barometric Pressure Start of Day:	mmHg: 753.7 Time: 16:00
Barometric Pressure End of Day:	mmHg: 749.1 Time: 10:10 12.18.18

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.1	0	22.3	Herrera DI Water
Conductivity (µS/cm)		1,000		out of solution
Conductivity (µS/cm)	100.2	100	22.4	
DO % Saturation	99.8	100	22.0	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.2	0	21.9	Herrera DI Water
Conductivity (µS/cm)	99.7	100	22.0	
DO % Saturation	99.7	100		

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	YSI Pro DSS #2
Date/Time:	12.17.16 10:00
Barometric Pressure Start of Day:	mmHg: 754.0 Time: 10:00
Barometric Pressure End of Day:	mmHg: 749.0 Time: 10:10 12.16.16

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.0	0	22.7	Herrera DI water
Conductivity (µS/cm)		1,000		Out of Solution
Conductivity (µS/cm)	100.0	100	22.7	
DO % Saturation	100.2	100	22.1	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	22.6	Herrera DI water
Conductivity (µS/cm)	99.6	100	22.2	
DO % Saturation	99.8	100	21.8	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

HERRERA

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Geigl K Bliss

Sample Date: 12/17/18 **Sample Time:** 19:40 PDT

Base Flow or Storm Event? 2 **Field Filtered Time:** 19:45 PST

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 51°

Water Quality Sampling

Sample ID: COLM 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	N U
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	light yellow
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:** 3.4m South

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.61

Reference Point (description): ~~Top of bolt on side door~~ SG

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 37.6

Dissolved Oxygen (mg/L) 11.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM QA

Sample Date: 12/17/16 **Sample Time:** 17:30 | 17:35 **PDT:**

Base Flow or Storm Event? (S) **Field Filtered Time:** 17:55 | 17:45 **PST:** X

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 7°C

HERRERA

Water Quality Sampling

Sample ID: COUM1 20161217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA59, 20161217

Filter blank sample ID: —

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: NA

Odor: NA

Sheen: NA

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.66

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.7

Specific Conductivity (µs/cm) 253.4

Dissolved Oxygen (mg/L) 11.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen

Sample Date: 12.17.18 **Sample Time:** ~~10:55~~ 17:05 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 17:10 (Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 71°

Water Quality Sampling

Sample ID: COUMO -20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: NA

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Shannon Lentsch **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES ✓ NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.2

Specific Conductivity (µs/cm) 222.4

Dissolved Oxygen (mg/L) ~~10.51~~ 10.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J, Gerard K Bliss

Sample Date: 12/17/18 **Sample Time:** 17:35 PDT

Base Flow or Storm Event? **Field Filtered Time:** 17:40 PST

(Must filter within 15 minutes of collection)

SITE ID: EVANS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 52°

Water Quality Sampling

Sample ID: EVANS -20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.92

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 7.9°C

Specific Conductivity (µs/cm) 184.7

Dissolved Oxygen (mg/L) 11.50

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Gaspel K Bliss

Sample Date: 12/17/18 **Sample Time:** 17:50 PDT:

Base Flow or Storm Event? Base **Field Filtered Time:** 17:55 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 50°

Water Quality Sampling

Sample ID: EVALSS-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	↓
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Louth **Signature:**

Date Checked: 1-4-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.25 → Is this right? It looks really high.

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.1° C

Specific Conductivity (µs/cm) 183.7

Dissolved Oxygen (mg/L) 11.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 Sample Time: 19:30 PDT: PST: X

Base Flow or Storm Event? B Field Filtered Time: 19:35

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 60°

Water Quality Sampling

Sample ID: MONMN-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: tannin

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY

Date: Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.26

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.9

Specific Conductivity (µs/cm) 147.6

Dissolved Oxygen (mg/L) 11.34

Quality Assurance

Checked By: John Leath Signature:

Date Checked: 1-8-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 **Sample Time:** 14:56

Base Flow or Storm Event? **Field Filtered Time:** 20:00 PDT: PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40°

Water Quality Sampling

Sample ID: MONMS-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	tannin
Odor:	organic smell
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sara Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.40

Reference Point (description): top of PVC pipe down

Water Quality Measurments

Temperature (°C) 8.4

Specific Conductivity (µs/cm) 270.8

Dissolved Oxygen (mg/L) 9.69

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.16 Sample Time: 20:30 PDT:

Base Flow or Storm Event? (S) Field Filtered Time: 20:35 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 60°

Water Quality Sampling

Sample ID: MONM-20161217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	none
Odor:	none
Sheen:	none
Floatables:	some foam

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Silvia Lomeli Signature:

Date Checked: 1-4-17 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 0.2

Specific Conductivity (µs/cm) 161.9

Dissolved Oxygen (mg/L) 11.105

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Getzin K Bliss

Sample Date: 12/17/2018 **Sample Time:** 19:00 PDT

Base Flow or Storm Event? Storm **Field Filtered Time:** 19:05 PST

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 51°

Water Quality Sampling

Sample ID: SEIMN 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: No

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leutz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~7.5~~ 0.63 ft

Reference Point (description): Top of bolt

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 71.3

Dissolved Oxygen (mg/L) 11.87

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. George, K. Bliss
Sample Date: 12/17/18
Sample Time:
PDT: **PST:** (circled)
Base Flow or Storm Event? (Storm circled)
Field Filtered Time:
(Must filter within 15 minutes of collection)

SITE ID: SEJMS
Project Number: 14-05806-000
Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 51°

Water Quality Sampling

Sample ID: SEJMS 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	↓
Transfer blank sample ID:	↓

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 (circled)
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.77
Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.2°
Specific Conductivity (µs/cm) 106.8
Dissolved Oxygen (mg/L) 90.5

not right or recorded % instead of mg/L? 9.05?

Quality Assurance

Checked By: John Lenth **Signature:** [signature]
Date Checked: 1-14-19 **Time:**
Data Entered into Database? YES NO **initials:**
Date Entered: **Time:**
Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. Gegg K. Bates

Sample Date: 12/17/18 **Sample Time:** 16:50 PDT

Base Flow or Storm Event? **Field Filtered Time:** 16:55 PST

(Must filter within 15 minutes of collection)

SITE ID: TOSMI-

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 52°

Water Quality Sampling

Sample ID: TOSMI-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	ND
Filter blank sample ID:	↓
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Solan Leuth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.76

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.9°C

Specific Conductivity (µs/cm) 259.6

Dissolved Oxygen (mg/L) 11.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.19 **Sample Time:** 18:06 PDT

Base Flow or Storm Event? 0 **Field Filtered Time:** 18:05 PST X

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 70°

Water Quality Sampling

Sample ID: TOSMO 20191217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	|
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	|
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	|
T Nitrogen	HDPE	250 ml	1	H_2SO_4	|
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	|
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	|

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	=
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	NA
Sheen:	NA
Floatables:	some algae

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Joshua Leuthy **Signature:**

Date Checked: 1-24-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.57

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 233.5

Dissolved Oxygen (mg/L) 11.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 **Sample Time:** 14:00 PDT: PST: X

Base Flow or Storm Event? 0 **Field Filtered Time:** 14:05

(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 6.5°

Water Quality Sampling

Sample ID: TYLM1-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Some turbidity
Color:	Tannin
Odor:	Organic smell
Sheen:	none
Floatables:	~~foam~~

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leuth **Signature:**

Date Checked: 1-10-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.45

Reference Point (description): down from top of culvert

Water Quality Measurments

Temperature (°C) 8.1

Specific Conductivity (µs/cm) 125.4

Dissolved Oxygen (mg/L) 10.96

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 **Sample Time:** 18:46 PDT: PST: X

Base Flow or Storm Event? 0 **Field Filtered Time:** 18:45

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 65°

Water Quality Sampling

Sample ID: TYLMO 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	"
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	"
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	"
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	"
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	"
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	"

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	~
Filter blank sample ID:	~
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	yellow-brown
Odor:	none none
Sheen:	none none
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lawrence **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.67

Reference Point (description): from top of culvert down

Water Quality Measurments

Temperature (°C) 8.5

Specific Conductivity (µs/cm) 121.5

Dissolved Oxygen (mg/L) 11.32

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/9/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/11/2018 / All locations, QA58 (SEIMS) Lab Ref No 1812-108

date 1/14/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	2	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	98	**±20**	9	**≤ 25**	17	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	4	**≤ 25**	35	**≤ 25**	OK	J SEIMS DUE TO FD RPD
Hardness	OK / SM 2340B	NA	**NA**	3	**≤180**	≤1.0 mg/L 1.0 mg/L	94,94	**±25**	97	**±15**	2, 0	**≤ 20**	2.5	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	2	**≤28**	≤1.0 mg/L 1.0 mg/L	104	**±25**	95	**±15**	0	**≤ 20**	2.7	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6	**≤28**	≤0.01 mg/L 0.01 mg/L	89	**±25**	96	**±20**	1	**≤ 20**	4.5	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	3-20	**≤28**	≤0.1 mg/L 0.1 mg/L	82-100	**±25**	95-102	**±20**	0-13	**≤ 20**	D=0.049 4.9	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/9/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/11/2018 / All locations, QA58 (SEIMS) Lab Ref No 1812-108

date 1/14/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	3-7	**≤180**	≤1.0 µg/L 1.0 µg/L	88,89	**±25**	NR	**±15**	NC, 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	3-7	**≤180**	≤5.0 µg/L 5.0 µg/L	102, 105	**±25**	NR	**±15**	NC, 3	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	7	**≤180**	≤1.0 µg/L 1.0 µg/L	69,74	**±25**	NR	**±15**	NC, 7	**≤ 20**	NC	**≤ 20**	OK	UJ MS SAMPLE QA58 AND SEIMS DUE TO MS %R
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	83,86	**±25**	NR	**±15**	NC, 4	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	4.1, 26	**≤ 35**	23	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

January 11, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1812-175

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on December 18, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Blair Goodrow
Project Manager

Enclosures

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

Case Narrative

Samples were collected on December 17, 2018 and received by the laboratory on December 18, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181217**					
Laboratory ID:	12-175-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**COUMI-20181217**					
Laboratory ID:	12-175-02					
Total Suspended Solids	**20**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**COUMO-20181217**					
Laboratory ID:	12-175-03					
Total Suspended Solids	**2.8**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**EVAMS-20181217**					
Laboratory ID:	12-175-04					
Total Suspended Solids	**2.6**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**EVALSS-20181217**					
Laboratory ID:	12-175-05					
Total Suspended Solids	**3.6**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**MONMN-20181217**					
Laboratory ID:	12-175-06					
Total Suspended Solids	**4.2**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**MONMS-20181217**					
Laboratory ID:	12-175-07					
Total Suspended Solids	**2.8**	1.0	SM 2540D	12-19-18	12-20-18	

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181217**					
Laboratory ID:	12-175-08					
Total Suspended Solids	**12**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**SEIMN-20181217**					
Laboratory ID:	12-175-09					
Total Suspended Solids	**20**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**SEIMS-20181217**					
Laboratory ID:	12-175-10					
Total Suspended Solids	**23**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**TOSMI-20181217**					
Laboratory ID:	12-175-11					
Total Suspended Solids	**3.0**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**TOSMO-20181217**					
Laboratory ID:	12-175-12					
Total Suspended Solids	**4.4**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**TYLMI-20181217**					
Laboratory ID:	12-175-13					
Total Suspended Solids	**6.2**	1.0	SM 2540D	12-19-18	12-20-18	
Client ID:	**TYLMO-20181217**					
Laboratory ID:	12-175-14					
Total Suspended Solids	**29**	1.0	SM 2540D	12-19-18	12-20-18	

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA59-20181217**					
Laboratory ID:	12-175-15					
Total Suspended Solids	**16**	1.0	SM 2540D	12-19-18	12-20-18	

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1219W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	12-19-18	12-20-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-175-06								
	ORIG	DUP							
Total Suspended Solids	**4.20**	**4.40**	NA	NA	NA	NA	5	22	
SPIKE BLANK									
Laboratory ID:	SB1219W1								
	SB		SB		SB				
Total Suspended Solids	**110**		100	NA	110	76-114	NA	NA	

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181025**					
Laboratory ID:	12-175-01					
Turbidity	**0.57**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**COUMI-20181025**					
Laboratory ID:	12-175-02					
Turbidity	**11**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**COUMO-20181025**					
Laboratory ID:	12-175-03					
Turbidity	**2.1**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**EVAMS-20181025**					
Laboratory ID:	12-175-04					
Turbidity	**1.6**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**EVALSS-20181025**					
Laboratory ID:	12-175-05					
Turbidity	**2.6**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**MONMN-20181025**					
Laboratory ID:	12-175-06					
Turbidity	**1.5**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**MONMS-20181025**					
Laboratory ID:	12-175-07					
Turbidity	**1.9**	0.10	EPA 180.1	12-18-18	12-18-18	

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181025**					
Laboratory ID:	12-175-08					
Turbidity	**7.0**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**SEIMN-20181025**					
Laboratory ID:	12-175-09					
Turbidity	**9.0**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**SEIMS-20181025**					
Laboratory ID:	12-175-10					
Turbidity	**10**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**TOSMI-20181025**					
Laboratory ID:	12-175-11					
Turbidity	**2.2**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**TOSMO-20181025**					
Laboratory ID:	12-175-12					
Turbidity	**2.7**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**TYLMI-20181025**					
Laboratory ID:	12-175-13					
Turbidity	**5.0**	0.10	EPA 180.1	12-18-18	12-18-18	
Client ID:	**TYLMO-20181025**					
Laboratory ID:	12-175-14					
Turbidity	**19**	0.10	EPA 180.1	12-18-18	12-18-18	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA59-20181217**					
Laboratory ID:	12-175-15					
Turbidity	**8.0**	0.10	EPA 180.1	12-18-18	12-18-18	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1218W1					
Turbidity	**ND**	0.10	EPA 180.1	12-18-18	12-18-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-175-01								
	ORIG	DUP							
Turbidity	**0.570**	**0.580**	NA	NA	NA	NA	2	15	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181217**					
Laboratory ID:	12-175-01					
Hardness	**13**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**COUMI-20181217**					
Laboratory ID:	12-175-02					
Hardness	**110**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**COUMO-20181217**					
Laboratory ID:	12-175-03					
Hardness	**95**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**EVAMS-20181217**					
Laboratory ID:	12-175-04					
Hardness	**86**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**EVALSS-20181217**					
Laboratory ID:	12-175-05					
Hardness	**80**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**MONMN-20181217**					
Laboratory ID:	12-175-06					
Hardness	**60**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**MONMS-20181217**					
Laboratory ID:	12-175-07					
Hardness	**120**	5.0	200.7/SM 2340B	12-21-18	12-21-18	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181217**					
Laboratory ID:	12-175-08					
Hardness	**67**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**SEIMN-20181217**					
Laboratory ID:	12-175-09					
Hardness	**29**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**SEIMS-20181217**					
Laboratory ID:	12-175-10					
Hardness	**45**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**TOSMI-20181217**					
Laboratory ID:	12-175-11					
Hardness	**110**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**TOSMO-20181217**					
Laboratory ID:	12-175-12					
Hardness	**100**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**TYLMI-20181217**					
Laboratory ID:	12-175-13					
Hardness	**54**	1.0	200.7/SM 2340B	12-21-18	12-21-18	
Client ID:	**TYLMO-20181217**					
Laboratory ID:	12-175-14					
Hardness	**49**	1.0	200.7/SM 2340B	12-21-18	12-21-18	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA59-20181217**					
Laboratory ID:	12-175-15					
Hardness	**110**	1.0	200.7/SM 2340B	12-21-18	12-21-18	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1221WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	12-21-18	12-21-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-175-02										
	ORIG	DUP									
Hardness	**115**	**117**	NA		NA	NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	12-175-02										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**256**	**251**	132	132	115	107	103	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB1227WH1										
	SB		SB			SB					
Hardness	**140**		132		NA	106		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181217**					
Laboratory ID:	12-175-01					
Dissolved Organic Carbon	**17**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**COUMI-20181217**					
Laboratory ID:	12-175-02					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**COUMO-20181217**					
Laboratory ID:	12-175-03					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**EVAMS-20181217**					
Laboratory ID:	12-175-04					
Dissolved Organic Carbon	**5.4**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**EVALSS-20181217**					
Laboratory ID:	12-175-05					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**MONMN-20181217**					
Laboratory ID:	12-175-06					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**MONMS-20181217**					
Laboratory ID:	12-175-07					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	12-20-18	12-20-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181217**					
Laboratory ID:	12-175-08					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**SEIMN-20181217**					
Laboratory ID:	12-175-09					
Dissolved Organic Carbon	**7.2**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**SEIMS-20181217**					
Laboratory ID:	12-175-10					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**TOSMI-20181217**					
Laboratory ID:	12-175-11					
Dissolved Organic Carbon	**4.6**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**TOSMO-20181217**					
Laboratory ID:	12-175-12					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**TYLMI-20181217**					
Laboratory ID:	12-175-13					
Dissolved Organic Carbon	**6.8**	1.0	SM 5310B	12-20-18	12-20-18	
Client ID:	**TYLMO-20181217**					
Laboratory ID:	12-175-14					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	12-20-18	12-20-18	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA59-20181217**					
Laboratory ID:	12-175-15					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	12-20-18	12-20-18	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1220D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	12-20-18	12-20-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-175-01								
	ORIG	DUP							
Dissolved Organic Carbon	**17.2**	**17.3**	NA	NA	NA	NA	0	15	
MATRIX SPIKE									
Laboratory ID:	12-175-01								
	MS		MS		MS				
Dissolved Organic Carbon	**27.7**		10.0	17.2	105	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1220D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.66**		10.0	NA	97	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181217**					
Laboratory ID:	12-175-01					
Total Phosphorus	**0.022**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**COUMI-20181217**					
Laboratory ID:	12-175-02					
Total Phosphorus	**0.088**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**COUMO-20181217**					
Laboratory ID:	12-175-03					
Total Phosphorus	**0.050**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**EVAMS-20181217**					
Laboratory ID:	12-175-04					
Total Phosphorus	**0.021**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**EVALSS-20181217**					
Laboratory ID:	12-175-05					
Total Phosphorus	**0.029**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**MONMN-20181217**					
Laboratory ID:	12-175-06					
Total Phosphorus	**0.037**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**MONMS-20181217**					
Laboratory ID:	12-175-07					
Total Phosphorus	**0.040**	0.010	EPA 365.1	12-21-18	12-26-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181217**					
Laboratory ID:	12-175-08					
Total Phosphorus	**0.055**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**SEIMN-20181217**					
Laboratory ID:	12-175-09					
Total Phosphorus	**0.054**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**SEIMS-20181217**					
Laboratory ID:	12-175-10					
Total Phosphorus	**0.067**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**TOSMI-20181217**					
Laboratory ID:	12-175-11					
Total Phosphorus	**0.047**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**TOSMO-20181217**					
Laboratory ID:	12-175-12					
Total Phosphorus	**0.053**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**TYLMI-20181217**					
Laboratory ID:	12-175-13					
Total Phosphorus	**0.044**	0.010	EPA 365.1	12-21-18	12-26-18	
Client ID:	**TYLMO-20181217**					
Laboratory ID:	12-175-14					
Total Phosphorus	**0.11**	0.010	EPA 365.1	12-21-18	12-26-18	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA59-20181217**					
Laboratory ID:	12-175-15					
Total Phosphorus	**0.081**	0.010	EPA 365.1	12-21-18	12-26-18	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1221W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	12-21-18	12-26-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-175-01								
	ORIG	DUP							
Total Phosphorus	**0.0223**	**0.0221**	NA	NA	NA	NA	1	12	
MATRIX SPIKE									
Laboratory ID:	12-175-01								
	MS		MS		MS				
Total Phosphorus	**0.270**		0.250	0.0223	99	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1221W1								
	SB		SB		SB				
Total Phosphorus	**0.255**		0.250	NA	102	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181217**					
Laboratory ID:	12-175-01					
Copper	**1.1**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**ND**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**COUMI-20181217**					
Laboratory ID:	12-175-02					
Copper	**1.4**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**42**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**COUMO-20181217**					
Laboratory ID:	12-175-03					
Copper	**1.3**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**20**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**EVAMS-20181217**					
Laboratory ID:	12-175-04					
Copper	**ND**	1.0	EPA 200.8	12-19-18	12-19-18	
Zinc	**ND**	5.0	EPA 200.8	12-19-18	12-19-18	
Client ID:	**EVALSS-20181217**					
Laboratory ID:	12-175-05					
Copper	**ND**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**ND**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**MONMN-20181217**					
Laboratory ID:	12-175-06					
Copper	**1.4**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**5.6**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**MONMS-20181217**					
Laboratory ID:	12-175-07					
Copper	**1.5**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**ND**	5.0	EPA 200.8	12-19-18	12-21-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181217**					
Laboratory ID:	12-175-08					
Copper	**1.7**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**14**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**SEIMN-20181217**					
Laboratory ID:	12-175-09					
Copper	**1.2**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**ND**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**SEIMS-20181217**					
Laboratory ID:	12-175-10					
Copper	**ND**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**ND**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**TOSMI-20181217**					
Laboratory ID:	12-175-11					
Copper	**2.6**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**240**	13	EPA 200.8	12-19-18	12-21-18	
Client ID:	**TOSMO-20181217**					
Laboratory ID:	12-175-12					
Copper	**1.7**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**100**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**TYLMI-20181217**					
Laboratory ID:	12-175-13					
Copper	**3.5**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**6.3**	5.0	EPA 200.8	12-19-18	12-21-18	
Client ID:	**TYLMO-20181217**					
Laboratory ID:	12-175-14					
Copper	**7.1**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**23**	5.0	EPA 200.8	12-19-18	12-21-18	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA59-20181217**					
Laboratory ID:	12-175-15					
Copper	**1.2**	1.0	EPA 200.8	12-19-18	12-21-18	
Zinc	**40**	5.0	EPA 200.8	12-19-18	12-21-18	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1219WH1					
Copper	**ND**	1.0	EPA 200.8	12-19-18	12-19-18	
Zinc	**ND**	5.0	EPA 200.8	12-19-18	12-19-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-175-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	12-175-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**103**	**105**	100	100	ND	**103**	**105**	75-125	2	20	
Zinc	**108**	**110**	100	100	ND	**108**	**110**	75-125	2	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181217**					
Laboratory ID:	12-175-01					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	
Client ID:	**COUMI-20181217**					
Laboratory ID:	12-175-02					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**35**	5.0	EPA 200.8		12-19-18	
Client ID:	**COUMO-20181217**					
Laboratory ID:	12-175-03					
Copper	**1.0**	1.0	EPA 200.8		12-19-18	
Zinc	**39**	5.0	EPA 200.8		12-19-18	
Client ID:	**EVAMS-20181217**					
Laboratory ID:	12-175-04					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	
Client ID:	**EVALSS-20181217**					
Laboratory ID:	12-175-05					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	
Client ID:	**MONMN-20181217**					
Laboratory ID:	12-175-06					
Copper	**1.2**	1.0	EPA 200.8		12-19-18	
Zinc	**5.6**	5.0	EPA 200.8		12-19-18	
Client ID:	**MONMS-20181217**					
Laboratory ID:	12-175-07					
Copper	**1.4**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181217**					
Laboratory ID:	12-175-08					
Copper	**1.1**	1.0	EPA 200.8		12-19-18	
Zinc	**7.6**	5.0	EPA 200.8		12-19-18	
Client ID:	**SEIMN-20181217**					
Laboratory ID:	12-175-09					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	
Client ID:	**SEIMS-20181217**					
Laboratory ID:	12-175-10					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	
Client ID:	**TOSMI-20181217**					
Laboratory ID:	12-175-11					
Copper	**2.4**	1.0	EPA 200.8		12-19-18	
Zinc	**210**	10	EPA 200.8		12-19-18	
Client ID:	**TOSMO-20181217**					
Laboratory ID:	12-175-12					
Copper	**1.4**	1.0	EPA 200.8		12-19-18	
Zinc	**80**	5.0	EPA 200.8		12-19-18	
Client ID:	**TYLMI-20181217**					
Laboratory ID:	12-175-13					
Copper	**2.7**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	
Client ID:	**TYLMO-20181217**					
Laboratory ID:	12-175-14					
Copper	**3.4**	1.0	EPA 200.8		12-19-18	
Zinc	**5.7**	5.0	EPA 200.8		12-19-18	

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA59-20181217**					
Laboratory ID:	12-175-15					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**32**	5.0	EPA 200.8		12-19-18	

Date of Report: January 11, 2019
Samples Submitted: December 18, 2018
Laboratory Reference: 1812-175
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1219D1					
Copper	**ND**	1.0	EPA 200.8		12-19-18	
Zinc	**ND**	5.0	EPA 200.8		12-19-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-175-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**32.2**	**35.2**	NA	NA		NA		NA	9	20	
MATRIX SPIKES											
Laboratory ID:	12-175-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**133**	**132**	160	160	ND	**83**	**83**	75-125	1	20	
Zinc	**179**	**179**	160	160	32.2	**92**	**92**	75-125	0	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 11 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181217	Water	18-A22358	Micro, NUT
COUMI-20181217	Water	18-A22359	Micro, NUT
COUMO-20181217	Water	18-A22360	Micro, NUT
EVAMS-20181217	Water	18-A22361	Micro, NUT
EVALSS-20181217	Water	18-A22362	Micro, NUT
MONMN-20181217	Water	18-A22363	Micro, NUT
MONMS-20181217	Water	18-A22364	Micro, NUT
MONM-20181217	Water	18-A22365	Micro, NUT
SEIMN-20181217	Water	18-A22366	Micro, NUT
SEIMS-20181217	Water	18-A22367	Micro, NUT
TOSMI-20181217	Water	18-A22368	Micro, NUT
TOSMO-20181217	Water	18-A22369	Micro, NUT
TYLMI-20181217	Water	18-A22370	Micro, NUT
TYLMO-20181217	Water	18-A22371	Micro, NUT
QA59-20181217	Water	18-A22372	Micro, NUT

Your samples were received on Tuesday, December 18, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 11 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 12-175

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 12-175
All results reported on an as received basis.

Date Received: 12/18/18
Date Reported: 1/11/19

AMTEST Identification Number **18-A22358**
Client Identification **COLM-20181217**
Sampling Date **12/17/18, 19:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	35.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.58	mg/l		0.1			
Total Nitrogen (TKN)	0.501	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.084	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22359**
Client Identification **COUMI-20181217**
Sampling Date **12/17/18, 17:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	31.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.222	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.40	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22360**
Client Identification **COUMO-20181217**
Sampling Date **12/17/18, 17:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	62.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.209	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.59	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22361**
Client Identification **EVAMS-20181217**
Sampling Date **12/17/18, 17:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	2.15	mg/l		0.1			
Total Nitrogen (TKN)	0.352	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	1.8	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22362**
Client Identification **EVALSS-20181217**
Sampling Date **12/17/18, 17:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	1.92	mg/l		0.1			
Total Nitrogen (TKN)	0.415	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	1.5	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22363**
Client Identification **MONMN-20181217**
Sampling Date **12/17/18, 19:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	16.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.52	mg/l		0.1			
Total Nitrogen (TKN)	0.259	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.26	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22364**
Client Identification **MONMS-20181217**
Sampling Date **12/17/18, 19:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.59	mg/l		0.1			
Total Nitrogen (TKN)	0.281	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.31	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22365**
Client Identification **MONM-20181217**
Sampling Date **12/17/18, 20:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	82.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.67	mg/l		0.1			
Total Nitrogen (TKN)	0.387	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.28	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22366**
Client Identification **SEIMN-20181217**
Sampling Date **12/17/18, 19:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	16.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.49	mg/l		0.1			
Total Nitrogen (TKN)	0.351	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.14	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22367**
Client Identification **SEIMS-20181217**
Sampling Date **12/17/18, 20:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.399	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.22	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22368**
Client Identification **TOSMI-20181217**
Sampling Date **12/17/18, 16:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	600	CFU/100 ml		20	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	1.24	mg/l		0.1			
Total Nitrogen (TKN)	0.237	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	1.0	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22369**
Client Identification **TOSMO-20181217**
Sampling Date **12/17/18, 18:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.93	mg/l		0.1			
Total Nitrogen (TKN)	0.258	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.67	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22370**
Client Identification **TYLMI-20181217**
Sampling Date **12/17/18, 19:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	58.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.360	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.38	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22371**
Client Identification **TYLMO-20181217**
Sampling Date **12/17/18, 18:40**

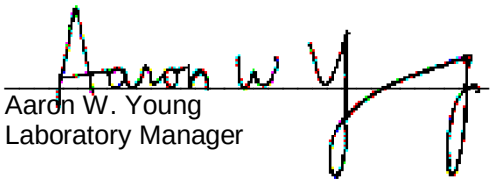
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	320	CFU/100 ml		20	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.96	mg/l		0.1			
Total Nitrogen (TKN)	0.530	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.43	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22372**
Client Identification **QA59-20181217**
Sampling Date **12/17/18, 17:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	27.	CFU/100 ml		2	SM 9222D	JM	12/18/18
Total Nitrogen (NOX&TKN)	0.65	mg/l		0.1			
Total Nitrogen (TKN)	0.239	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.41	mg/l		0.01	SM4500NO3	JC	01/03/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
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Professional Analytical Services

QC Summary for sample numbers: 18-A22358 to 18-A22372

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A022333	Fecal coliform	CFU/100 ml	160	130	21.
18-A022341	Fecal coliform	CFU/100 ml	24.	44.	59.
18-A022358	Fecal coliform	CFU/100 ml	35.	20.	55.
18-A022372	Fecal coliform	CFU/100 ml	27.	44.	48.
18-A22366	Total Nitrogen (TKN)	mg/l	0.351	0.312	12.
18-A22678	Total Nitrogen (TKN)	mg/l	0.479	0.471	1.7
18-A22688	Total Nitrogen (TKN)	mg/l	0.365	0.393	7.4
18-A22692	Total Nitrogen (TKN)	mg/l	0.353	0.404	13.
19-A210	Total Nitrogen (TKN)	mg/l	0.214	0.212	0.94
18-A22368	Total Nitrate + Nitrite	mg/l	1.0	1.0	0.00
18-A22456	Total Nitrate + Nitrite	mg/l	< 0.01	< 0.01	
18-A22466	Total Nitrate + Nitrite	mg/l	0.74	0.76	2.7
18-A22487	Total Nitrate + Nitrite	mg/l	< 0.01	< 0.01	
18-A22622	Total Nitrate + Nitrite	mg/l	1.0	0.96	4.1

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A22366	Total Nitrogen (TKN)	mg/l	0.351	1.32	1.00	96.90 %
18-A22678	Total Nitrogen (TKN)	mg/l	0.479	1.34	1.00	86.10 %
18-A22688	Total Nitrogen (TKN)	mg/l	0.365	1.32	1.00	95.50 %
18-A22692	Total Nitrogen (TKN)	mg/l	0.353	1.35	1.00	99.70 %
19-A210	Total Nitrogen (TKN)	mg/l	0.214	1.26	1.00	104.60 %
18-A22358	Total Nitrate + Nitrite	mg/l	0.084	1.1	1.0	101.60 %
18-A22368	Total Nitrate + Nitrite	mg/l	1.0	2.1	1.0	110.00 %
18-A22456	Total Nitrate + Nitrite	mg/l	< 0.01	1.0	1.0	100.00 %
18-A22466	Total Nitrate + Nitrite	mg/l	0.74	1.8	1.0	106.00 %
18-A22487	Total Nitrate + Nitrite	mg/l	< 0.01	1.0	1.0	100.00 %
18-A22622	Total Nitrate + Nitrite	mg/l	1.0	1.9	1.0	90.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.05	105. %
Total Nitrogen (TKN)	mg/l	1.00	1.07	107. %
Total Nitrogen (TKN)	mg/l	1.00	1.06	106. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %

QC Summary for sample numbers: 18-A22358 to 18-A22372...

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-175

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20181217 22358	12/17/18	19:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20181217 59	12/17/18	17:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20181217 60	12/17/18	17:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20181217 61	12/17/18	17:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20181217 62	12/17/18	17:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20181217 63	12/17/18	19:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20181217 64	12/17/18	19:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20181217 65	12/17/18	20:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20181217 66	12/17/18	19:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20181217 67	12/17/18	20:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	COE	12/18/18	1SW	
Received by:	AMTEST T= 3.9	12/18/18	15:10	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-175

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20181217 22368	12/17/18	16:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20181217 69	12/17/18	18:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20181217 70	12/17/18	19:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20181217 71	12/17/18	18:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA59-20181217 72	12/17/18	17:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	12/18/18	1510	
Received by:	AMTEST T= 3.9	12/18/18	15:10	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 12-175

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1217	121718	19:40	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1217		17:30	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1217		17:05	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1217		17:35	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1217		17:50	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1217		19:30	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1217		19:55	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1217		20:30	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1217		19:00	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1217		20:30	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1217		16:50	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1217		18:00	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1217		19:00	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1217		18:40	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 59-20181217	↓	17:40	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 12.18.18 Received by [signature] Date 12/18/18
Firm Herrera Time 16:20 PM Firm ALPHA Time 11:20 AM
Relinquished by [signature] Date 12/18/18 Received by [signature] Date 12/18/18
Firm ALPHA Time 1207 Firm OE Time 1207

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No.

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
	COLM-2018 1217	121718	19:40	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2018 1217		17:30	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2018 1217		17:05	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2018 1217		17:35	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2018 1217		17:50	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2018 1217		19:30	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2018 1217		19:55	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2018 1217		20:30	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2018 1217		19:00	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2018 1217		20:30	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2018 1217		16:50	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2018 1217		18:00	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2018 1217		19:00	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2018 1217		18:40	Water	7	X	X	X	X	X	X	X	X	X			
	QA 59-2018 1217	↓	17:40	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 12.18.18 Received by [signature] Date 12/19/18
Firm Herrera Time 10:20AM Firm AQUA Time 11:20AM
RB

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	YSI Pro DSS #2
Date/Time:	12.17.18 16:00
Barometric Pressure Start of Day:	mmHg: 753.7 Time: 16:00
Barometric Pressure End of Day:	mmHg: 749.1 Time: 10:10 12.18.18

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.1	0	22.3	Herrera DI Water
Conductivity (µS/cm)		1,000		out of solution
Conductivity (µS/cm)	100.2	100	22.4	
DO % Saturation	99.8	100	22.0	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.2	0	21.9	Herrera DI Water
Conductivity (µS/cm)	99.7	100	22.0	
DO % Saturation	99.7	100		

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	YSI Pro DSS #2
Date/Time:	12.17.16 10:00
Barometric Pressure Start of Day:	mmHg: 754.0 Time: 10:00
Barometric Pressure End of Day:	mmHg: 749.0 Time: 10:10 12.16.16

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.0	0	22.7	Herrera DI water
Conductivity (µS/cm)		1,000		Out of Solution
Conductivity (µS/cm)	100.0	100	22.7	
DO % Saturation	100.2	100	22.1	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	22.6	Herrera DI water
Conductivity (µS/cm)	99.6	100	22.2	
DO % Saturation	99.8	100	21.8	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

HERRERA

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Geigl K Bliss

Sample Date: 12/17/18 **Sample Time:** 19:40 PDT

Base Flow or Storm Event? 2 **Field Filtered Time:** 19:45 PST

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 51°

Water Quality Sampling

Sample ID: COLM 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	N U
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	light yellow
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:** 3.4m South

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.61

Reference Point (description): ~~Top of bolt on side door~~ SG

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 37.6

Dissolved Oxygen (mg/L) 11.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM QA

Sample Date: 12/17/16 **Sample Time:** 17:30 | 17:35 **PDT:**

Base Flow or Storm Event? (S) **Field Filtered Time:** 17:55 | 17:45 **PST:** X

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 7°C

HERRERA

Water Quality Sampling

Sample ID: COUM1 20161217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA59, 20161217

Filter blank sample ID: —

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: NA

Odor: NA

Sheen: NA

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.66

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.7

Specific Conductivity (µs/cm) 253.4

Dissolved Oxygen (mg/L) 11.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen

Sample Date: 12.17.18 **Sample Time:** ~~10:55~~ 17:05 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 17:10 (Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 71°

Water Quality Sampling

Sample ID: COUMO -20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: NA

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Shannon Lentsch **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES ✓ NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.2

Specific Conductivity (µs/cm) 222.4

Dissolved Oxygen (mg/L) ~~10.51~~ 10.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J, Gerard K Bliss

Sample Date: 12/17/18 **Sample Time:** 17:35 PDT

Base Flow or Storm Event? **Field Filtered Time:** 17:40 PST

(Must filter within 15 minutes of collection)

SITE ID: EVANS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 52°

Water Quality Sampling

Sample ID: EVANS -20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.92

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 7.9°C

Specific Conductivity (µs/cm) 184.7

Dissolved Oxygen (mg/L) 11.50

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Gaspel K Bliss

Sample Date: 12/17/18 **Sample Time:** 17:50 PDT:

Base Flow or Storm Event? Base **Field Filtered Time:** 17:55 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 50°

Water Quality Sampling

Sample ID: EVALSS-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	NO
Filter blank sample ID:	↓
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Louth **Signature:**

Date Checked: 1-4-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.25 → Is this right? It looks really high.

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.1° C

Specific Conductivity (µs/cm) 183.7

Dissolved Oxygen (mg/L) 11.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 Sample Time: 19:30 PDT: PST: X

Base Flow or Storm Event? B Field Filtered Time: 19:35

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 60°

Water Quality Sampling

Sample ID: MONMN-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: tannin

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY

Date: Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.26

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.9

Specific Conductivity (µs/cm) 147.6

Dissolved Oxygen (mg/L) 11.34

Quality Assurance

Checked By: John Leath Signature:

Date Checked: 1-8-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 **Sample Time:** 14:56

Base Flow or Storm Event? **Field Filtered Time:** 20:00 PDT: PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40°

Water Quality Sampling

Sample ID: MONMS-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	tannin
Odor:	organic smell
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sara Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.40

Reference Point (description): top of PVC pipe down

Water Quality Measurments

Temperature (°C) 8.4

Specific Conductivity (µs/cm) 270.8

Dissolved Oxygen (mg/L) 9.69

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.16 Sample Time: 20:30 PDT:

Base Flow or Storm Event? (S) Field Filtered Time: 20:35 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 60°

Water Quality Sampling

Sample ID: MONM-20161217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	none
Odor:	none
Sheen:	none
Floatables:	some foam

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Silvia Lomeli Signature:

Date Checked: 1-4-17 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 0.2

Specific Conductivity (µs/cm) 161.9

Dissolved Oxygen (mg/L) 11.105

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Getzin K Bliss

Sample Date: 12/17/2018 **Sample Time:** 19:00 PDT

Base Flow or Storm Event? Storm **Field Filtered Time:** 19:05 PST

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 51°

Water Quality Sampling

Sample ID: SEIMN 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: No

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leutz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~7.5~~ 0.63 ft

Reference Point (description): Top of bolt

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 71.3

Dissolved Oxygen (mg/L) 11.87

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. George K. Bliss

Sample Date: 12/17/18

Sample Time:

PDT:

PST: (circled)

Base Flow or Storm Event? (Storm circled)

Field Filtered Time:

(Must filter within 15 minutes of collection)

SITE ID: SEJMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 51°

Water Quality Sampling

Sample ID: SEJMS 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NO

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 (circled)

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.71

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.2°

Specific Conductivity (µs/cm) 106.8

Dissolved Oxygen (mg/L) 90.5 (circled)

not right or recorded % instead of mg/L? 9.05?

Quality Assurance

Checked By: John Lenth

Signature:

Date Checked: 1-14-19

Time:

Data Entered into Database? YES NO initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. Gegg K. Bates

Sample Date: 12/17/18 **Sample Time:** 16:50 PDT

Base Flow or Storm Event? **Field Filtered Time:** 16:55 PST

(Must filter within 15 minutes of collection)

SITE ID: TOSMI-

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 52°

Water Quality Sampling

Sample ID: TOSMI-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	ND
Filter blank sample ID:	↓
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Solan Leuth **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.76

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.9°C

Specific Conductivity (µs/cm) 259.6

Dissolved Oxygen (mg/L) 11.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.19 **Sample Time:** 18:06 PDT

Base Flow or Storm Event? 0 **Field Filtered Time:** 18:05 PST X

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 70°

Water Quality Sampling

Sample ID: TOSMO 20191217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	|
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	|
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	|
T Nitrogen	HDPE	250 ml	1	H_2SO_4	|
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	|
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	|

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	=
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	NA
Sheen:	NA
Floatables:	some algae

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Joshua Leuthy **Signature:**

Date Checked: 1-24-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.57

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 233.5

Dissolved Oxygen (mg/L) 11.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 **Sample Time:** 14:00 PDT: PST: X

Base Flow or Storm Event? 0 **Field Filtered Time:** 14:05

(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 6.5°

Water Quality Sampling

Sample ID: TYLM1-20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Some turbidity
Color:	Tannin
Odor:	Organic smell
Sheen:	none
Floatables:	~~foam~~

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leuth **Signature:**

Date Checked: 1-10-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.45

Reference Point (description): down from top of culvert

Water Quality Measurments

Temperature (°C) 8.1

Specific Conductivity (µs/cm) 125.4

Dissolved Oxygen (mg/L) 10.96

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.17.18 **Sample Time:** 18:46 PDT: PST: X

Base Flow or Storm Event? 0 **Field Filtered Time:** 18:45

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 65°

Water Quality Sampling

Sample ID: TYLMO 20181217

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	"
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	"
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	"
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	"
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	"
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	"

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	~
Filter blank sample ID:	~
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	yellow-brown
Odor:	none none
Sheen:	none none
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lawrence **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.67

Reference Point (description): from top of culvert down

Water Quality Measurments

Temperature (°C) 8.5

Specific Conductivity (µs/cm) 121.5

Dissolved Oxygen (mg/L) 11.32

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/17/2018 / All locations, QA (COUMI) Lab Ref No 1812-175

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	3	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	110	**±20**	5	**≤ 25**	22	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	2	**≤ 25**	32	**≤ 25**	OK	J COUMI DUE TO FD RPD
Hardness	OK / SM 2340B	NA	**NA**	4	**≤180**	≤1.0 mg/L 1.0 mg/L	107,103	**±25**	106	**±15**	2,2	**≤ 20**	0	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	3	**≤28**	≤1.0 mg/L 1.0 mg/L	105	**±25**	97	**±15**	0	**≤ 20**	D=0.3	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	9	**≤28**	≤0.01 mg/L 0.01 mg/L	99	**±25**	102	**±20**	1	**≤ 20**	8.3	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	17-24	**≤28**	≤0.1 mg/L 0.1 mg/L	97-110	**±25**	100-107	**±20**	NC, 12	**≤ 20**	D=0.017 2.5	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/17/2018 / All locations, QA (COUMI) Lab Ref No 1812-175

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤1.0 µg/L 1.0 µg/L	103,105	**±25**	NR	**±15**	NC, 2	**≤ 20**	D=0.2	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	108,110	**±25**	NR	**±15**	NC, 2	**≤ 20**	4.9	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	83,83	**±25**	NR	**±15**	NC, 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	92,92	**±25**	NR	**±15**	9,0	**≤ 20**	9.0	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	55,48	**≤ 35**	14	**≤ 50**	OK	J COLM AND QA59 DUE TO LAB DUP RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

January 11, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1812-262

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on December 28, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Blair Goodrow
Project Manager

Enclosures

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

Case Narrative

Samples were collected on December 28, 2018 and received by the laboratory on December 28, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Turbidity EPA 180.1 Analysis

The duplicate RPD for turbidity is outside control limits due to sample inhomogeneity.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181228**					
Laboratory ID:	12-262-01					
Total Suspended Solids	**1.0**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**COUMI-20181228**					
Laboratory ID:	12-262-02					
Total Suspended Solids	**120**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**COUMO-20181228**					
Laboratory ID:	12-262-03					
Total Suspended Solids	**81**	1.4	SM 2540D	1-2-19	1-3-19	
Client ID:	**EVAMS-20181228**					
Laboratory ID:	12-262-04					
Total Suspended Solids	**10**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**EVALSS-20181228**					
Laboratory ID:	12-262-05					
Total Suspended Solids	**25**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**MONMN-20181228**					
Laboratory ID:	12-262-06					
Total Suspended Solids	**20**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**MONMS-20181228**					
Laboratory ID:	12-262-07					
Total Suspended Solids	**4.4**	1.0	SM 2540D	1-2-19	1-3-19	

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181228**					
Laboratory ID:	12-262-08					
Total Suspended Solids	**28**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**SEIMN-20181228**					
Laboratory ID:	12-262-09					
Total Suspended Solids	**59**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**SEIMS-20181228**					
Laboratory ID:	12-262-10					
Total Suspended Solids	**27**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**TOSMI-20181228**					
Laboratory ID:	12-262-11					
Total Suspended Solids	**140**	1.4	SM 2540D	1-2-19	1-3-19	
Client ID:	**TOSMO-20181228**					
Laboratory ID:	12-262-12					
Total Suspended Solids	**260**	2.5	SM 2540D	1-2-19	1-3-19	
Client ID:	**TYLMI-20181228**					
Laboratory ID:	12-262-13					
Total Suspended Solids	**26**	1.0	SM 2540D	1-2-19	1-3-19	
Client ID:	**TYLMO-20181228**					
Laboratory ID:	12-262-14					
Total Suspended Solids	**27**	1.0	SM 2540D	1-2-19	1-3-19	

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA60-20181228**					
Laboratory ID:	12-262-15					
Total Suspended Solids	**28**	1.0	SM 2540D	1-2-19	1-3-19	

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0102W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-2-19	1-3-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-262-12								
	ORIG	DUP							
Total Suspended Solids	**261**	**250**	NA	NA	NA	NA	4	22	
SPIKE BLANK									
Laboratory ID:	SB0102W1								
	SB		SB		SB				
Total Suspended Solids	**88.0**		100	NA	88	76-114	NA	NA	

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181228**					
Laboratory ID:	12-262-01					
Turbidity	**1.2**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**COUMI-20181228**					
Laboratory ID:	12-262-02					
Turbidity	**50**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**COUMO-20181228**					
Laboratory ID:	12-262-03					
Turbidity	**46**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**EVAMS-20181228**					
Laboratory ID:	12-262-04					
Turbidity	**7.9**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**EVALSS-20181228**					
Laboratory ID:	12-262-05					
Turbidity	**10**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**MONMN-20181228**					
Laboratory ID:	12-262-06					
Turbidity	**16**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**MONMS-20181228**					
Laboratory ID:	12-262-07					
Turbidity	**6.6**	0.10	EPA 180.1	12-28-18	12-28-18	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181228**					
Laboratory ID:	12-262-08					
Turbidity	**16**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**SEIMN-20181228**					
Laboratory ID:	12-262-09					
Turbidity	**33**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**SEIMS-20181228**					
Laboratory ID:	12-262-10					
Turbidity	**10**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**TOSMI-20181228**					
Laboratory ID:	12-262-11					
Turbidity	**44**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**TOSMO-20181228**					
Laboratory ID:	12-262-12					
Turbidity	**96**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**TYLMI-20181228**					
Laboratory ID:	12-262-13					
Turbidity	**11**	0.10	EPA 180.1	12-28-18	12-28-18	
Client ID:	**TYLMO-20181228**					
Laboratory ID:	12-262-14					
Turbidity	**15**	0.10	EPA 180.1	12-28-18	12-28-18	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA60-2018**					
Laboratory ID:	12-262-15					
Turbidity	**9.6**	0.10	EPA 180.1	12-28-18	12-28-18	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1228W1					
Turbidity	**ND**	0.10	EPA 180.1	12-28-18	12-28-18	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-262-01								
	ORIG	DUP							
Turbidity	**1.18**	**0.900**	NA	NA	NA	NA	27	15	L

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181228**					
Laboratory ID:	12-262-01					
Hardness	**13**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**COUMI-20181228**					
Laboratory ID:	12-262-02					
Hardness	**56**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**COUMO-20181228**					
Laboratory ID:	12-262-03					
Hardness	**52**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**EVAMS-20181228**					
Laboratory ID:	12-262-04					
Hardness	**82**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**EVALSS-20181228**					
Laboratory ID:	12-262-05					
Hardness	**77**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**MONMN-20181228**					
Laboratory ID:	12-262-06					
Hardness	**63**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**MONMS-20181228**					
Laboratory ID:	12-262-07					
Hardness	**83**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181228**					
Laboratory ID:	12-262-08					
Hardness	**68**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**SEIMN-20181228**					
Laboratory ID:	12-262-09					
Hardness	**31**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**SEIMS-20181228**					
Laboratory ID:	12-262-10					
Hardness	**42**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**TOSMI-20181228**					
Laboratory ID:	12-262-11					
Hardness	**30**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**TOSMO-20181228**					
Laboratory ID:	12-262-12					
Hardness	**58**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**TYLMI-20181228**					
Laboratory ID:	12-262-13					
Hardness	**61**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	
Client ID:	**TYLMO-20181228**					
Laboratory ID:	12-262-14					
Hardness	**24**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA60-20181228**					
Laboratory ID:	12-262-15					
Hardness	**75**	1.0	200.7/SM 2340B	1-4-19	1-4&7-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0104WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	1-4-19	1-4-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-262-07										
	ORIG	DUP									
Hardness	**83.5**	**84.9**	NA		NA	NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	12-262-07										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**210**	**217**	132	132	83.5	96	101	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB0104WH1										
	SB		SB			SB					
Hardness	**142**		132		NA	108		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181228**					
Laboratory ID:	12-262-01					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**COUMI-20181228**					
Laboratory ID:	12-262-02					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**COUMO-20181228**					
Laboratory ID:	12-262-03					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**EVAMS-20181228**					
Laboratory ID:	12-262-04					
Dissolved Organic Carbon	**4.6**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**EVALSS-20181228**					
Laboratory ID:	12-262-05					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**MONMN-20181228**					
Laboratory ID:	12-262-06					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**MONMS-20181228**					
Laboratory ID:	12-262-07					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	1-2-19	1-2-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181228**					
Laboratory ID:	12-262-08					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**SEIMN-20181228**					
Laboratory ID:	12-262-09					
Dissolved Organic Carbon	**8.0**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**SEIMS-20181228**					
Laboratory ID:	12-262-10					
Dissolved Organic Carbon	**6.6**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**TOSMI-20181228**					
Laboratory ID:	12-262-11					
Dissolved Organic Carbon	**3.0**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**TOSMO-20181228**					
Laboratory ID:	12-262-12					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**TYLMI-20181228**					
Laboratory ID:	12-262-13					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	1-2-19	1-2-19	
Client ID:	**TYLMO-20181228**					
Laboratory ID:	12-262-14					
Dissolved Organic Carbon	**3.2**	1.0	SM 5310B	1-2-19	1-2-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA60-20181228**					
Laboratory ID:	12-262-15					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	1-2-19	1-2-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0102D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	1-2-19	1-2-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-262-01								
	ORIG	DUP							
Dissolved Organic Carbon	**14.7**	**14.8**	NA	NA	NA	NA	0	15	
MATRIX SPIKE									
Laboratory ID:	12-262-01								
	MS		MS		MS				
Dissolved Organic Carbon	**25.1**		10.0	14.7	104	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0102D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.72**		10.0	NA	97	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181228**					
Laboratory ID:	12-262-01					
Total Phosphorus	**0.016**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**COUMI-20181228**					
Laboratory ID:	12-262-02					
Total Phosphorus	**0.23**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**COUMO-20181228**					
Laboratory ID:	12-262-03					
Total Phosphorus	**0.98**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**EVAMS-20181228**					
Laboratory ID:	12-262-04					
Total Phosphorus	**0.86**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**EVALSS-20181228**					
Laboratory ID:	12-262-05					
Total Phosphorus	**0.052**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**MONMN-20181228**					
Laboratory ID:	12-262-06					
Total Phosphorus	**0.075**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**MONMS-20181228**					
Laboratory ID:	12-262-07					
Total Phosphorus	**0.038**	0.010	EPA 365.1	1-2-19	1-7-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181228**					
Laboratory ID:	12-262-08					
Total Phosphorus	**0.075**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**SEIMN-20181228**					
Laboratory ID:	12-262-09					
Total Phosphorus	**0.098**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**SEIMS-20181228**					
Laboratory ID:	12-262-10					
Total Phosphorus	**0.074**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**TOSMI-20181228**					
Laboratory ID:	12-262-11					
Total Phosphorus	**0.17**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**TOSMO-20181228**					
Laboratory ID:	12-262-12					
Total Phosphorus	**0.30**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**TYLMI-20181228**					
Laboratory ID:	12-262-13					
Total Phosphorus	**0.072**	0.010	EPA 365.1	1-2-19	1-7-19	
Client ID:	**TYLMO-20181228**					
Laboratory ID:	12-262-14					
Total Phosphorus	**0.076**	0.010	EPA 365.1	1-2-19	1-7-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA60-20181228**					
Laboratory ID:	12-262-15					
Total Phosphorus	**0.051**	0.010	EPA 365.1	1-2-19	1-7-19	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0102W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	1-2-19	1-7-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-262-01								
	ORIG	DUP							
Total Phosphorus	**0.0158**	**0.0176**	NA	NA	NA	NA	11	12	
MATRIX SPIKE									
Laboratory ID:	12-262-01								
	MS		MS		MS				
Total Phosphorus	**0.255**		0.250	0.0158	96	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0102W1								
	SB		SB		SB				
Total Phosphorus	**0.244**		0.250	NA	98	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181228**					
Laboratory ID:	12-262-01					
Copper	**ND**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**ND**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**COUMI-20181228**					
Laboratory ID:	12-262-02					
Copper	**5.7**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**68**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**COUMO-20181228**					
Laboratory ID:	12-262-03					
Copper	**5.8**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**53**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**EVAMS-20181228**					
Laboratory ID:	12-262-04					
Copper	**ND**	1.0	EPA 200.8	12-31-18	12-31-18	
Zinc	**ND**	5.0	EPA 200.8	12-31-18	12-31-18	
Client ID:	**EVALSS-20181228**					
Laboratory ID:	12-262-05					
Copper	**ND**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**ND**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**MONMN-20181228**					
Laboratory ID:	12-262-06					
Copper	**2.0**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**12**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**MONMS-20181228**					
Laboratory ID:	12-262-07					
Copper	**1.8**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**21**	5.0	EPA 200.8	12-31-18	1-2-19	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181228**					
Laboratory ID:	12-262-08					
Copper	**2.2**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**21**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**SEIMN-20181228**					
Laboratory ID:	12-262-09					
Copper	**2.0**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**ND**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**SEIMS-20181228**					
Laboratory ID:	12-262-10					
Copper	**ND**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**5.4**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**TOSMI-20181228**					
Laboratory ID:	12-262-11					
Copper	**9.2**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**88**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**TOSMO-20181228**					
Laboratory ID:	12-262-12					
Copper	**12**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**160**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**TYLMI-20181228**					
Laboratory ID:	12-262-13					
Copper	**4.4**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**15**	5.0	EPA 200.8	12-31-18	1-2-19	
Client ID:	**TYLMO-20181228**					
Laboratory ID:	12-262-14					
Copper	**4.8**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**21**	5.0	EPA 200.8	12-31-18	1-2-19	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA60-20181228**					
Laboratory ID:	12-262-15					
Copper	**ND**	1.0	EPA 200.8	12-31-18	1-2-19	
Zinc	**ND**	5.0	EPA 200.8	12-31-18	1-2-19	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1231WH1					
Copper	**ND**	1.0	EPA 200.8	12-31-18	12-31-18	
Zinc	**ND**	5.0	EPA 200.8	12-31-18	12-31-18	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-262-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	12-262-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**97.8**	**101**	100	100	ND	**98**	**101**	75-125	3	20	
Zinc	**108**	**112**	100	100	ND	**108**	**112**	75-125	4	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20181228**					
Laboratory ID:	12-262-01					
Copper	**ND**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	
Client ID:	**COUMI-20181228**					
Laboratory ID:	12-262-02					
Copper	**1.0**	1.0	EPA 200.8		1-2-19	
Zinc	**11**	5.0	EPA 200.8		1-2-19	
Client ID:	**COUMO-20181228**					
Laboratory ID:	12-262-03					
Copper	**1.5**	1.0	EPA 200.8		1-2-19	
Zinc	**14**	5.0	EPA 200.8		1-2-19	
Client ID:	**EVAMS-20181228**					
Laboratory ID:	12-262-04					
Copper	**ND**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	
Client ID:	**EVALSS-20181228**					
Laboratory ID:	12-262-05					
Copper	**ND**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	
Client ID:	**MONMN-20181228**					
Laboratory ID:	12-262-06					
Copper	**1.1**	1.0	EPA 200.8		1-2-19	
Zinc	**5.6**	5.0	EPA 200.8		1-2-19	
Client ID:	**MONMS-20181228**					
Laboratory ID:	12-262-07					
Copper	**1.3**	1.0	EPA 200.8		1-2-19	
Zinc	**12**	5.0	EPA 200.8		1-2-19	

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20181228**					
Laboratory ID:	12-262-08					
Copper	**1.1**	1.0	EPA 200.8		1-2-19	
Zinc	**7.6**	5.0	EPA 200.8		1-2-19	
Client ID:	**SEIMN-20181228**					
Laboratory ID:	12-262-09					
Copper	**ND**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	
Client ID:	**SEIMS-20181228**					
Laboratory ID:	12-262-10					
Copper	**ND**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	
Client ID:	**TOSMI-20181228**					
Laboratory ID:	12-262-11					
Copper	**2.2**	1.0	EPA 200.8		1-2-19	
Zinc	**23**	5.0	EPA 200.8		1-2-19	
Client ID:	**TOSMO-20181228**					
Laboratory ID:	12-262-12					
Copper	**1.7**	1.0	EPA 200.8		1-2-19	
Zinc	**19**	5.0	EPA 200.8		1-2-19	
Client ID:	**TYLMI-20181228**					
Laboratory ID:	12-262-13					
Copper	**2.3**	1.0	EPA 200.8		1-2-19	
Zinc	**5.9**	5.0	EPA 200.8		1-2-19	
Client ID:	**TYLMO-20181228**					
Laboratory ID:	12-262-14					
Copper	**1.6**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA60-20181228**					
Laboratory ID:	12-262-15					
Copper	**ND**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	

Date of Report: January 11, 2019
Samples Submitted: December 28, 2018
Laboratory Reference: 1812-262
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0102D1					
Copper	**ND**	1.0	EPA 200.8		1-2-19	
Zinc	**ND**	5.0	EPA 200.8		1-2-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-262-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	12-262-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**69.0**	**69.4**	80.0	80.0	ND	**86**	**87**	75-125	1	20	
Zinc	**82.8**	**85.2**	80.0	80.0	ND	**104**	**107**	75-125	3	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 11 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20181228	Water	18-A22678	Micro, NUT
COUMI-20181228	Water	18-A22679	Micro, NUT
COUMO-20181228	Water	18-A22680	Micro, NUT
EVAMS-20181228	Water	18-A22681	Micro, NUT
EVALSS-20181228	Water	18-A22682	Micro, NUT
MONMN-20181228	Water	18-A22683	Micro, NUT
MONMS-20181228	Water	18-A22684	Micro, NUT
MONM-20181228	Water	18-A22685	Micro, NUT
SEIMN-20181228	Water	18-A22686	Micro, NUT
SEIMS-20181228	Water	18-A22687	Micro, NUT
TOSMI-20181228	Water	18-A22688	Micro, NUT
TOSMO-20181228	Water	18-A22689	Micro, NUT
TYLMI-20181228	Water	18-A22690	Micro, NUT
TYLMO-20181228	Water	18-A22691	Micro, NUT
QA60-20181228	Water	18-A22692	Micro, NUT

Your samples were received on Friday, December 28, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

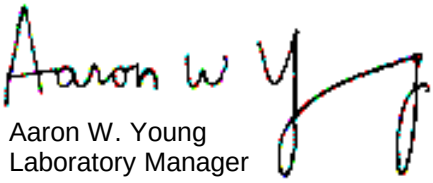
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jan 11 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 12-262

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 12-262
All results reported on an as received basis.

Date Received: 12/28/18
Date Reported: 1/11/19

AMTEST Identification Number **18-A22678**
Client Identification **COLM-20181228**
Sampling Date **12/28/18, 14:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	50.	CFU/100 ml		2	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.52	mg/l		0.1			
Total Nitrogen (TKN)	0.479	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.044	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22679**
Client Identification **COUMI-20181228**
Sampling Date **12/28/18, 12:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	260	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.665	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.13	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22680**
Client Identification **COUMO-20181228**
Sampling Date **12/28/18, 11:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.86	mg/l		0.1			
Total Nitrogen (TKN)	0.601	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.26	mg/l		0.01	SM4500NO3	JC	01/03/19

AMTEST Identification Number **18-A22681**
Client Identification **EVAMS-20181228**
Sampling Date **12/28/18, 12:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	13.	CFU/100 ml		2	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	2.09	mg/l		0.1			
Total Nitrogen (TKN)	0.388	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	1.7	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22682**
Client Identification **EVALSS-20181228**
Sampling Date **12/28/18, 12:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	64.	CFU/100 ml		2	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	1.73	mg/l		0.1			
Total Nitrogen (TKN)	0.326	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	1.4	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22683**
Client Identification **MONMN-20181228**
Sampling Date **12/28/18, 14:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	44.	CFU/100 ml		2	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.67	mg/l		0.1			
Total Nitrogen (TKN)	0.406	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.26	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22684**
Client Identification **MONMS-20181228**
Sampling Date **12/28/18, 14:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	260	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.307	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.23	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22685**
Client Identification **MONM-20181228**
Sampling Date **12/28/18, 15:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	240	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.526	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.27	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22686**
Client Identification **SEIMN-20181228**
Sampling Date **12/28/18, 13:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	60.	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.64	mg/l		0.1			
Total Nitrogen (TKN)	0.499	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.14	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22687**
Client Identification **SEIMS-20181228**
Sampling Date **12/28/18, 15:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	160	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.66	mg/l		0.1			
Total Nitrogen (TKN)	0.462	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.20	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22688**
Client Identification **TOSMI-20181228**
Sampling Date **12/28/18, 12:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2200	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.64	mg/l		0.1			
Total Nitrogen (TKN)	0.365	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.28	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22689**
Client Identification **TOSMO-20181228**
Sampling Date **12/28/18, 12:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	1.18	mg/l		0.1			
Total Nitrogen (TKN)	0.861	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.32	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22690**
Client Identification **TYLMI-20181228**
Sampling Date **12/28/18, 13:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	27.	CFU/100 ml		2	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.93	mg/l		0.1			
Total Nitrogen (TKN)	0.427	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.50	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22691**
Client Identification **TYLMO-20181228**
Sampling Date **12/28/18, 13:10**

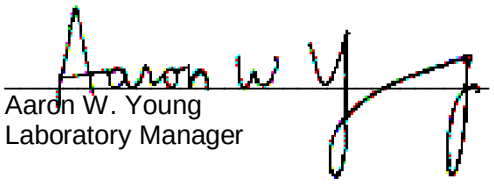
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	98.	CFU/100 ml		2	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.383	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	0.16	mg/l		0.01	SM4500NO3	JC	01/09/19

AMTEST Identification Number **18-A22692**
Client Identification **QA60-20181228**
Sampling Date **12/28/18, 13:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		20	SM 9222D	KF	12/29/18
Total Nitrogen (NOX&TKN)	1.75	mg/l		0.1			
Total Nitrogen (TKN)	0.353	mg/l		0.1	SM4500N	JC	01/10/19
Total Nitrate + Nitrite	1.4	mg/l		0.01	SM4500NO3	JC	01/09/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
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Kirkland, WA, 98034
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Professional Analytical Services

QC Summary for sample numbers: 18-A22678 to 18-A22692

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
18-A22684	Fecal coliform	CFU/100 ml	260	280	7.4
18-A22692	Fecal coliform	CFU/100 ml	140	120	15.
18-A22366	Total Nitrogen (TKN)	mg/l	0.351	0.312	12.
18-A22678	Total Nitrogen (TKN)	mg/l	0.479	0.471	1.7
18-A22688	Total Nitrogen (TKN)	mg/l	0.365	0.393	7.4
18-A22692	Total Nitrogen (TKN)	mg/l	0.353	0.404	13.
19-A210	Total Nitrogen (TKN)	mg/l	0.214	0.212	0.94
18-A22368	Total Nitrate + Nitrite	mg/l	1.0	1.0	0.00
18-A22456	Total Nitrate + Nitrite	mg/l	< 0.01	< 0.01	
18-A22466	Total Nitrate + Nitrite	mg/l	0.74	0.76	2.7
18-A22487	Total Nitrate + Nitrite	mg/l	< 0.01	< 0.01	
18-A22622	Total Nitrate + Nitrite	mg/l	1.0	0.96	4.1
18-A22690	Total Nitrate + Nitrite	mg/l	0.50	0.60	18.
19-A208	Total Nitrate + Nitrite	mg/l	0.078	0.073	6.6
19-A328	Total Nitrate + Nitrite	mg/l	0.30	0.31	3.3

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
18-A22366	Total Nitrogen (TKN)	mg/l	0.351	1.32	1.00	96.90 %
18-A22678	Total Nitrogen (TKN)	mg/l	0.479	1.34	1.00	86.10 %
18-A22688	Total Nitrogen (TKN)	mg/l	0.365	1.32	1.00	95.50 %
18-A22692	Total Nitrogen (TKN)	mg/l	0.353	1.35	1.00	99.70 %
19-A210	Total Nitrogen (TKN)	mg/l	0.214	1.26	1.00	104.60 %
18-A22358	Total Nitrate + Nitrite	mg/l	0.084	1.1	1.0	101.60 %
18-A22368	Total Nitrate + Nitrite	mg/l	1.0	2.1	1.0	110.00 %
18-A22456	Total Nitrate + Nitrite	mg/l	< 0.01	1.0	1.0	100.00 %
18-A22466	Total Nitrate + Nitrite	mg/l	0.74	1.8	1.0	106.00 %
18-A22487	Total Nitrate + Nitrite	mg/l	< 0.01	1.0	1.0	100.00 %
18-A22622	Total Nitrate + Nitrite	mg/l	1.0	1.9	1.0	90.00 %
18-A22690	Total Nitrate + Nitrite	mg/l	0.50	1.6	1.0	110.00 %
19-A208	Total Nitrate + Nitrite	mg/l	0.078	1.1	1.0	102.20 %
19-A328	Total Nitrate + Nitrite	mg/l	0.30	1.4	1.0	110.00 %

QC Summary for sample numbers: 18-A22678 to 18-A22692...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.05	105. %
Total Nitrogen (TKN)	mg/l	1.00	1.07	107. %
Total Nitrogen (TKN)	mg/l	1.00	1.06	106. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.96	96.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-262

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20181228 22678	12/28/18	14:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20181228 79	12/28/18	12:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20181228 80	12/28/18	11:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20181228 81	12/28/18	12:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20181228 82	12/28/18	12:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20181228 83	12/28/18	14:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20181228 84	12/28/18	14:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20181228 85	12/28/18	15:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20181228 86	12/28/18	13:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20181228 87	12/28/18	15:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	Courier	12/28/18	1640	
Received by:	AmTest	12/28/18	16:40	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

T=6.5

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 12-262

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20181228 226 88	12/28/18	12:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20181228 89	12/28/18	12:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20181228 90	12/28/18	13:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20181228 91	12/28/18	13:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA60-20181228 92	12/28/18	13:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite ES	12/28/18	1640	
Received by:	Amtest	12/28/18	16:40	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

T-65

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Laboratory No. 12-262

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 1228	12/28	14:20	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1228		12:10	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1228		11:50	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1228		12:35	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1228		12:50	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1228		14:00	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1228		14:30	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1228		15:00	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1228		13:45	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1228		15:15	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1228		12:05	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1228		12:40	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1228		13:30	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1228		13:10	Water	7	X	X	X	X	X	X	X	X	X			
15	QA60-2018 1228		13:00	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by MMuller Date 12.28.18 Received by _____ Date 12/28/18
Firm Herrera Time 15:40 Firm ORE Time 1540
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Laboratory No. 12-262

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
			Requested Analyses														
1	COLM-2018 1228	1228	14:20	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 1228		12:10	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 1228		11:50	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 1228		12:35	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 1228		12:50	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 1228		14:00	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 1228		14:30	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 1228		15:00	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 1228		13:45	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 1228		15:15	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 1228		12:05	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 1228		12:40	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 1228		13:30	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 1228		13:10	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 60-2018		13:00	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by MMuller Date 12.28.18 Received by _____ Date 12/28/18
Firm Herrera Time 15:40 Firm _____ Time 1540
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Mullen
Meter:	ProDSS #1
Date/Time:	10:50 am / 12.28.18
Barometric Pressure Start of Day:	mmHg: 766.9 Time: 10:50
Barometric Pressure End of Day:	mmHg: 764.6 Time: 17:30

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.3	0	22.1	Herrera DI water
Conductivity (µS/cm)	99.9	1,000	22.0	
Conductivity (µS/cm)		100		out of 1000
DO % Saturation	101.5	100	21.6	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	23.1	Herrera DI water
Conductivity (µS/cm)	99.9	100	22.4	
DO % Saturation	100.5	100	21.7	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Mullen
Meter:	Pro DSS #2
Date/Time:	10:50 am / 12.28.18
Barometric Pressure Start of Day:	mmHg: 767.2 Time: 10:50
Barometric Pressure End of Day:	mmHg: 764.2 Time: 17:30

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.7	0	22.5	Herrera DI water
Conductivity (µS/cm)	99.8	1,000	22.5	
Conductivity (µS/cm)		100		out of 1000
DO % Saturation	101.3	100	22.1	calibrated new value: 101.0

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.1	0	22.1	Herrera DI water
Conductivity (µS/cm)	99.1	100	23.1	
DO % Saturation	100.2	100	22.2	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Geiger K Bliss

Sample Date: 12/28/18 **Sample Time:** 14:20 PDT

Base Flow or Storm Event? (B) **Field Filtered Time:** 14:25 PST (Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 41° rainy

Water Quality Sampling

Sample ID: COLM - 20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	yellow (light)
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.79

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.3°

Specific Conductivity (µs/cm) 36.3

Dissolved Oxygen (mg/L) 12.12

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller

Sample Date: 12.29.16 **Sample Time:** 12:10 PDT

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 12:18 PST

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 41°

Water Quality Sampling

Sample ID: COUM1-20161216

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	No
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	–
Filter blank sample ID:	–
Transfer blank sample ID:	–

Visual and Olfactory Conditions:

Clarity:	~~slight~~ turbid
Color:	brown
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.75

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 12.26 MM 12.29.16

Dissolved Oxygen (mg/L) 10.6

Quality Assurance

Checked By: Sahan Lentl **Signature:**

Date Checked: 1-14-17 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen

Sample Date: 12.28.16 **Sample Time:** 11:50 PDT: PST: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 11:55

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 41°

HERRERA

Water Quality Sampling

Sample ID: COUMO2016-1228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	–
Filter blank sample ID:	–
Transfer blank sample ID:	–

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	brown
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lauth **Signature:**

Date Checked: 1-14-17 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.49

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 0.6

Specific Conductivity (µs/cm) 95.6

Dissolved Oxygen (mg/L) 12.08

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. Gogel K. Bliss

Sample Date: 12/28/18 **Sample Time:** 12:35 PDT

Base Flow or Storm Event? **Field Filtered Time:** 12:40 PST

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 40 ° rainy

Water Quality Sampling

Sample ID: EVAMS-20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	✓
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: light foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Emma Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.92

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.9

Specific Conductivity (µs/cm) 178.1

Dissolved Oxygen (mg/L) 12.36

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Gerard K Bliss QA

Sample Date: 12/28/18 **Sample Time:** 12:50 | 13:00 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:55 | 13:05 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 42° rainy

Water Quality Sampling

Sample ID: EVALSS - 20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	Y
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	QA60 20181228
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zahn Landon **Signature:**

Date Checked: 1-4-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.39

Reference Point (description): 5G

Water Quality Measurments

Temperature (°C) 5.9°

Specific Conductivity (µs/cm) 168.0

Dissolved Oxygen (mg/L) 12.67

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.28.18 **Sample Time:** 14:00 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 14:05

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: MONMN-20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	No
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: turbid

Color: light brown

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Robin Kendall **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.28

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.3

Specific Conductivity (µs/cm) 147.9

Dissolved Oxygen (mg/L) 11.92

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 122918 **Sample Time:** 14:30 PDT: PST: X

Base Flow or Storm Event? (Must filter within 15 minutes of collection) **Field Filtered Time:** 14:35

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: MONMS-20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zahra Lovell **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.52

Reference Point (description): top of PVC down

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 11.06

Dissolved Oxygen (mg/L) 213.3

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. Geige K. Bloss

Sample Date: 12/28/18 **Sample Time:** 13:00 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 15:05 PST:

(Must filter within 15 minutes of collection)

SITE ID: MoNM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 41° rainy

Water Quality Sampling

Sample ID: MoNM 20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	No
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Brian Lamb **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): —

Reference Point (description): —

Water Quality Measurments

Temperature (°C) 6.2°

Specific Conductivity (µs/cm) 158.3

Dissolved Oxygen (mg/L) 12.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Geiger K Bliss

Sample Date: 12/28/18 **Sample Time:** 12:45 PDT

Base Flow or Storm Event? **Field Filtered Time:** 13:50 PST
(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 41 ° rainy

Water Quality Sampling

Sample ID: SEIMN-20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
Color: none
Odor: none
Sheen: none
Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zoltan Levente **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1 X
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.65

Reference Point (description): top of bolt

Water Quality Measurments

Temperature (°C) 5.3

Specific Conductivity (µs/cm) 65.9

Dissolved Oxygen (mg/L) 12.68

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 122818 **Sample Time:** 15:15 PDT: PST: X

Base Flow or Storm Event? (Must filter within 15 minutes of collection) **Field Filtered Time:** 15:20

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: SEIMS 20181218

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NC
DOC *	HDPE	250 ml	1	HCL	|
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	|
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	|
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	|
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	|
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	|

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	–
Filter blank sample ID:	–
Transfer blank sample ID:	–

Visual and Olfactory Conditions:

Clarity:	clear
Color:	tannin
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zhan Lenz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.902

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.7

Specific Conductivity (µs/cm) 93.4

Dissolved Oxygen (mg/L) 11.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Geigel K. Bliss

Sample Date: 12/28/18 **Sample Time:** 12:00 PDT / PST

Base Flow or Storm Event? (Storm)

Field Filtered Time: 12:05 (Must filter within 15 minutes of collection)

SITE ID: TOSMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 40° rainy

Water Quality Sampling

Sample ID: TOSMI-20181228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Turbid

Color: gray

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zoltan Levetal **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.98

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.6

Specific Conductivity (µs/cm) 49.2

Dissolved Oxygen (mg/L) 12.43

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen

Sample Date: 12.28.18 **Sample Time:** 12:46 PDT

Base Flow or Storm Event? (3) **Field Filtered Time:** 12:46 PST

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: TOSMO 2018-1218

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	-
Filter blank sample ID:	-
Transfer blank sample ID:	-

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	brown
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sara Lentz **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 x

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): SG

Reference Point (description): 0.94

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 109.8

Dissolved Oxygen (mg/L) 12.18

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 12.29.18 **Sample Time:** 13:30 PDT:

Base Flow or Storm Event? (circle) **Field Filtered Time:** 13:35 PST: X

(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: TYLM1 20181229

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	=
Filter blank sample ID:	=
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	some turbidity
Color:	light brown
Odor:	none
Sheen:	red residue @ culvert mouth
Floatables:	~~none~~ foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leahy **Signature:**

Date Checked: 1-14-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.46

Reference Point (description): top of culvert down

Water Quality Measurments

Temperature (°C) 7.3

Specific Conductivity (µs/cm) 132.6

Dissolved Oxygen (mg/L) 11.47

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller

Sample Date: 12.20.18 **Sample Time:** 13:10 PDT: PST: X

Base Flow or Storm Event? (Must filter within 15 minutes of collection) **Field Filtered Time:** 13:15

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: TYLMO 2018-1228

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	–
Filter blank sample ID:	–
Transfer blank sample ID:	–

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	brown
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lentz **Signature:**

Date Checked: 1-16-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.62

Reference Point (description): top of culvert down

Water Quality Measurments

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 54.9

Dissolved Oxygen (mg/L) 12.27

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/28/2018 / All locations, QA60 (EVALSS) Lab Ref No 1812-262

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	6	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	88	**±20**	4	**≤ 25**	11	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	27	**≤ 25**	4.1	**≤ 25**	OK	J COLM DUE TO LAB DUP RPD
Hardness	OK / SM 2340B	NA	**NA**	7-10	**≤180**	≤1.0 mg/L 1.0 mg/L	96,101	**±25**	108	**±15**	2,3	**≤ 20**	2.6	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	5	**≤28**	≤1.0 mg/L 1.0 mg/L	104	**±25**	97	**±15**	0	**≤ 20**	0	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	10	**≤28**	≤0.01 mg/L 0.01 mg/L	96	**±25**	98	**±20**	11	**≤ 20**	1.9	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	6-13	**≤28**	≤0.1 mg/L 0.1 mg/L	86-	**±25**	96-107	**±20**	1.7-18	**≤ 20**	D=0.027 0	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 12/28/2018 / All locations, QA60 (EVALSS) Lab Ref No 1812-262

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	98,101	**±25**	NR	**±15**	NC, 3	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	108,112	**±25**	NR	**±15**	NC, 4	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	86, 87	**±25**	NR	**±15**	NC. 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	104, 107	**±25**	NR	**±15**	NC, 3	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	7.4, 15	**≤ 35**	74	**≤ 50**	OK	J EVALSS DUE TO FD RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 6, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1901-112

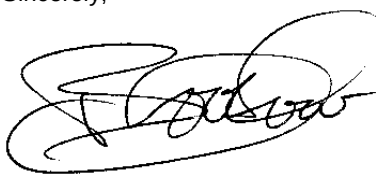
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on January 15, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

Case Narrative

Samples were collected on January 15, 2019 and received by the laboratory on January 15, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190115**					
Laboratory ID:	01-112-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**COUMI-20190115**					
Laboratory ID:	01-112-02					
Total Suspended Solids	**18**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**COUMO-20190115**					
Laboratory ID:	01-112-03					
Total Suspended Solids	**5.0**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**EVAMS-20190115**					
Laboratory ID:	01-112-04					
Total Suspended Solids	**3.6**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**EVALSS-20190115**					
Laboratory ID:	01-112-05					
Total Suspended Solids	**3.6**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**MONMN-20190115**					
Laboratory ID:	01-112-06					
Total Suspended Solids	**1.8**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**MONMS-20190115**					
Laboratory ID:	01-112-07					
Total Suspended Solids	**9.0**	1.0	SM 2540D	1-17-19	1-18-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190115**					
Laboratory ID:	01-112-08					
Total Suspended Solids	**1.6**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**SEIMN-20190115**					
Laboratory ID:	01-112-09					
Total Suspended Solids	**3.8**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**SEIMS-20190115**					
Laboratory ID:	01-112-10					
Total Suspended Solids	**1.4**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**TOSMI-20190115**					
Laboratory ID:	01-112-11					
Total Suspended Solids	**2.2**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**TOSMO-20190115**					
Laboratory ID:	01-112-12					
Total Suspended Solids	**1.0**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**TYLMI-20190115**					
Laboratory ID:	01-112-13					
Total Suspended Solids	**2.8**	1.0	SM 2540D	1-17-19	1-18-19	
Client ID:	**TYLMO-20190115**					
Laboratory ID:	01-112-14					
Total Suspended Solids	**1.4**	1.0	SM 2540D	1-17-19	1-18-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6120190115**					
Laboratory ID:	01-112-15					
Total Suspended Solids	**1.0**	1.0	SM 2540D	1-17-19	1-18-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0117W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-17-19	1-18-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-112-02								
	ORIG	DUP							
Total Suspended Solids	**18.4**	**20.0**	NA	NA	NA	NA	8	22	
SPIKE BLANK									
Laboratory ID:	SB0117W1								
	SB		SB		SB				
Total Suspended Solids	**115**		100	NA	115	79-116	NA	NA	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190115**					
Laboratory ID:	01-112-01					
Turbidity	**0.63**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**COUMI-20190115**					
Laboratory ID:	01-112-02					
Turbidity	**4.4**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**COUMO-20190115**					
Laboratory ID:	01-112-03					
Turbidity	**1.7**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**EVAMS-20190115**					
Laboratory ID:	01-112-04					
Turbidity	**2.2**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**EVALSS-20190115**					
Laboratory ID:	01-112-05					
Turbidity	**1.6**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**MONMN-20190115**					
Laboratory ID:	01-112-06					
Turbidity	**1.8**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**MONMS-20190115**					
Laboratory ID:	01-112-07					
Turbidity	**5.0**	0.10	EPA 180.1	1-16-19	1-16-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
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Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190115**					
Laboratory ID:	01-112-08					
Turbidity	**1.9**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**SEIMN-20190115**					
Laboratory ID:	01-112-09					
Turbidity	**2.7**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**SEIMS-20190115**					
Laboratory ID:	01-112-10					
Turbidity	**2.9**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**TOSMI-20190115**					
Laboratory ID:	01-112-11					
Turbidity	**2.5**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**TOSMO-20190115**					
Laboratory ID:	01-112-12					
Turbidity	**2.3**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**TYLMI-20190115**					
Laboratory ID:	01-112-13					
Turbidity	**2.6**	0.10	EPA 180.1	1-16-19	1-16-19	
Client ID:	**TYLMO-20190115**					
Laboratory ID:	01-112-14					
Turbidity	**3.9**	0.10	EPA 180.1	1-16-19	1-16-19	

Date of Report: February 6, 2019
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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6120190115**					
Laboratory ID:	01-112-15					
Turbidity	**2.5**	0.10	EPA 180.1	1-16-19	1-16-19	

Date of Report: February 6, 2019
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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0116W1					
Turbidity	**ND**	0.10	EPA 180.1	1-16-19	1-16-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-112-04								
	ORIG	DUP							
Turbidity	**2.21**	**2.12**	NA	NA	NA	NA	4	15	

Date of Report: February 6, 2019
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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190115**					
Laboratory ID:	01-112-01					
Hardness	**11**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**COUMI-20190115**					
Laboratory ID:	01-112-02					
Hardness	**140**	5.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**COUMO-20190115**					
Laboratory ID:	01-112-03					
Hardness	**110**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**EVAMS-20190115**					
Laboratory ID:	01-112-04					
Hardness	**85**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**EVALSS-20190115**					
Laboratory ID:	01-112-05					
Hardness	**83**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**MONMN-20190115**					
Laboratory ID:	01-112-06					
Hardness	**69**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**MONMS-20190115**					
Laboratory ID:	01-112-07					
Hardness	**130**	5.0	200.7/SM 2340B	1-16-19	1-16-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190115**					
Laboratory ID:	01-112-08					
Hardness	**80**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**SEIMN-20190115**					
Laboratory ID:	01-112-09					
Hardness	**28**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**SEIMS-20190115**					
Laboratory ID:	01-112-10					
Hardness	**45**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**TOSMI-20190115**					
Laboratory ID:	01-112-11					
Hardness	**140**	5.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**TOSMO-20190115**					
Laboratory ID:	01-112-12					
Hardness	**110**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**TYLMI-20190115**					
Laboratory ID:	01-112-13					
Hardness	**87**	1.0	200.7/SM 2340B	1-16-19	1-16-19	
Client ID:	**TYLMO-20190115**					
Laboratory ID:	01-112-14					
Hardness	**82**	1.0	200.7/SM 2340B	1-16-19	1-16-19	

Date of Report: February 6, 2019
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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6120190115**					
Laboratory ID:	01-112-15					
Hardness	**86**	1.0	200.7/SM 2340B	1-16-19	1-16-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0116WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	1-16-19	1-16-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-112-01										
	ORIG	DUP									
Hardness	**11.5**	**11.0**	NA		NA	NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	01-112-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**143**	**142**	132	132	11.5	100	99	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0116WH1										
	SB		SB			SB					
Hardness	**129**		132		NA	98		80-120	NA	NA	

Date of Report: February 6, 2019
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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190115**					
Laboratory ID:	01-112-01					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**COUMI-20190115**					
Laboratory ID:	01-112-02					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**COUMO-20190115**					
Laboratory ID:	01-112-03					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**EVAMS-20190115**					
Laboratory ID:	01-112-04					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**EVALSS-20190115**					
Laboratory ID:	01-112-05					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**MONMN-20190115**					
Laboratory ID:	01-112-06					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**MONMS-20190115**					
Laboratory ID:	01-112-07					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	1-18-19	1-18-19	

Date of Report: February 6, 2019
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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190115**					
Laboratory ID:	01-112-08					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**SEIMN-20190115**					
Laboratory ID:	01-112-09					
Dissolved Organic Carbon	**7.6**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**SEIMS-20190115**					
Laboratory ID:	01-112-10					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**TOSMI-20190115**					
Laboratory ID:	01-112-11					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**TOSMO-20190115**					
Laboratory ID:	01-112-12					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**TYLMI-20190115**					
Laboratory ID:	01-112-13					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	1-18-19	1-18-19	
Client ID:	**TYLMO-20190115**					
Laboratory ID:	01-112-14					
Dissolved Organic Carbon	**4.6**	1.0	SM 5310B	1-18-19	1-18-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6120190115**					
Laboratory ID:	01-112-15					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	1-18-19	1-18-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0118D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	1-18-19	1-18-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-112-01								
	ORIG	DUP							
Dissolved Organic Carbon	**15.5**	**15.8**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	01-112-01								
	MS		MS		MS				
Dissolved Organic Carbon	**27.1**		10.0	15.5	116	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0118D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.9**		10.0	NA	109	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190115**					
Laboratory ID:	01-112-01					
Total Phosphorus	**0.020**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**COUMI-20190115**					
Laboratory ID:	01-112-02					
Total Phosphorus	**0.083**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**COUMO-20190115**					
Laboratory ID:	01-112-03					
Total Phosphorus	**0.053**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**EVAMS-20190115**					
Laboratory ID:	01-112-04					
Total Phosphorus	**0.028**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**EVALSS-20190115**					
Laboratory ID:	01-112-05					
Total Phosphorus	**0.027**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**MONMN-20190115**					
Laboratory ID:	01-112-06					
Total Phosphorus	**0.032**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**MONMS-20190115**					
Laboratory ID:	01-112-07					
Total Phosphorus	**0.027**	0.010	EPA 365.1	1-17-19	1-18-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190115**					
Laboratory ID:	01-112-08					
Total Phosphorus	**0.031**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**SEIMN-20190115**					
Laboratory ID:	01-112-09					
Total Phosphorus	**0.033**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**SEIMS-20190115**					
Laboratory ID:	01-112-10					
Total Phosphorus	**0.030**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**TOSMI-20190115**					
Laboratory ID:	01-112-11					
Total Phosphorus	**0.053**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**TOSMO-20190115**					
Laboratory ID:	01-112-12					
Total Phosphorus	**0.057**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**TYLMI-20190115**					
Laboratory ID:	01-112-13					
Total Phosphorus	**0.029**	0.010	EPA 365.1	1-17-19	1-18-19	
Client ID:	**TYLMO-20190115**					
Laboratory ID:	01-112-14					
Total Phosphorus	**0.038**	0.010	EPA 365.1	1-17-19	1-18-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6120190115**					
Laboratory ID:	01-112-15					
Total Phosphorus	**0.030**	0.010	EPA 365.1	1-17-19	1-18-19	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0117W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	1-17-19	1-18-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-112-01								
	ORIG	DUP							
Total Phosphorus	**0.0200**	**0.0169**	NA	NA	NA	NA	17	12	C
MATRIX SPIKE									
Laboratory ID:	01-112-01								
	MS		MS		MS				
Total Phosphorus	**0.258**		0.250	0.0200	95	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0117W1								
	SB		SB		SB				
Total Phosphorus	**0.242**		0.250	NA	97	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190115**					
Laboratory ID:	01-112-01					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**COUMI-20190115**					
Laboratory ID:	01-112-02					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**17**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**COUMO-20190115**					
Laboratory ID:	01-112-03					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**12**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**EVAMS-20190115**					
Laboratory ID:	01-112-04					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**EVALSS-20190115**					
Laboratory ID:	01-112-05					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**MONMN-20190115**					
Laboratory ID:	01-112-06					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**MONMS-20190115**					
Laboratory ID:	01-112-07					
Copper	**1.1**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**7.1**	5.0	EPA 200.8	1-16-19	1-16-19	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190115**					
Laboratory ID:	01-112-08					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**7.7**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**SEIMN-20190115**					
Laboratory ID:	01-112-09					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**SEIMS-20190115**					
Laboratory ID:	01-112-10					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**TOSMI-20190115**					
Laboratory ID:	01-112-11					
Copper	**1.2**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**97**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**TOSMO-20190115**					
Laboratory ID:	01-112-12					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**130**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**TYLMI-20190115**					
Laboratory ID:	01-112-13					
Copper	**1.7**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	
Client ID:	**TYLMO-20190115**					
Laboratory ID:	01-112-14					
Copper	**1.2**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	

Date of Report: February 6, 2019
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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6120190115**					
Laboratory ID:	01-112-15					
Copper	**1.7**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0116WH2					
Copper	**ND**	1.0	EPA 200.8	1-16-19	1-16-19	
Zinc	**ND**	5.0	EPA 200.8	1-16-19	1-16-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-112-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-112-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**92.0**	**92.4**	100	100	ND	**92**	**92**	75-125	0	20	
Zinc	**105**	**108**	100	100	ND	**105**	**108**	75-125	2	20	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190115**					
Laboratory ID:	01-112-01					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	
Client ID:	**COUMI-20190115**					
Laboratory ID:	01-112-02					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**14**	5.0	EPA 200.8		1-16-19	
Client ID:	**COUMO-20190115**					
Laboratory ID:	01-112-03					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**9.8**	5.0	EPA 200.8		1-16-19	
Client ID:	**EVAMS-20190115**					
Laboratory ID:	01-112-04					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	
Client ID:	**EVALSS-20190115**					
Laboratory ID:	01-112-05					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	
Client ID:	**MONMN-20190115**					
Laboratory ID:	01-112-06					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	
Client ID:	**MONMS-20190115**					
Laboratory ID:	01-112-07					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**6.1**	5.0	EPA 200.8		1-16-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190115**					
Laboratory ID:	01-112-08					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**7.4**	5.0	EPA 200.8		1-16-19	
Client ID:	**SEIMN-20190115**					
Laboratory ID:	01-112-09					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	
Client ID:	**SEIMS-20190115**					
Laboratory ID:	01-112-10					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	
Client ID:	**TOSMI-20190115**					
Laboratory ID:	01-112-11					
Copper	**1.1**	1.0	EPA 200.8		1-16-19	
Zinc	**89**	5.0	EPA 200.8		1-16-19	
Client ID:	**TOSMO-20190115**					
Laboratory ID:	01-112-12					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**110**	5.0	EPA 200.8		1-16-19	
Client ID:	**TYLMI-20190115**					
Laboratory ID:	01-112-13					
Copper	**1.7**	1.0	EPA 200.8		1-16-19	
Zinc	**26**	5.0	EPA 200.8		1-16-19	
Client ID:	**TYLMO-20190115**					
Laboratory ID:	01-112-14					
Copper	**1.2**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6120190115**					
Laboratory ID:	01-112-15					
Copper	**1.7**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	

Date of Report: February 6, 2019
Samples Submitted: January 15, 2019
Laboratory Reference: 1901-112
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0116D1					
Copper	**ND**	1.0	EPA 200.8		1-16-19	
Zinc	**ND**	5.0	EPA 200.8		1-16-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-112-15										
	ORIG	DUP									
Copper	**1.68**	**1.64**	NA	NA		NA		NA	2	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-112-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**68.2**	**69.0**	80.0	80.0	1.68	**83**	**84**	75-125	1	20	
Zinc	**83.2**	**84.6**	80.0	80.0	ND	**104**	**106**	75-125	2	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 6 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190115	Water	19-A613	Micro, NUT
COUMI-20190115	Water	19-A614	Micro, NUT
COUMO-20190115	Water	19-A615	Micro, NUT
EVAMS-20190115	Water	19-A616	Micro, NUT
EVALSS-20190115	Water	19-A617	Micro, NUT
MONMN-20190115	Water	19-A618	Micro, NUT
MONMS-20190115	Water	19-A619	Micro, NUT
MONM-20190115	Water	19-A620	Micro, NUT
SEIMN-20190115	Water	19-A621	Micro, NUT
SEIMS-20190115	Water	19-A622	Micro, NUT
TOSMI-20190115	Water	19-A623	Micro, NUT
TOSMO-20190115	Water	19-A624	Micro, NUT
TYLMI-20190115	Water	19-A625	Micro, NUT
TYLMO-20190115	Water	19-A626	Micro, NUT
QA61-20190115	Water	19-A627	Micro, NUT

Your samples were received on Tuesday, January 15, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

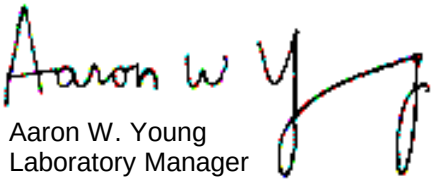
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 6 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 01-112

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

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(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 01-112
All results reported on an as received basis.

Date Received: 01/15/19
Date Reported: 2/ 6/19

AMTEST Identification Number **19-A613**
Client Identification **COLM-20190115**
Sampling Date **01/15/19, 13:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	7.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.44	mg/l		0.1			
Total Nitrogen (TKN)	0.445	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	< 0.01	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A614**
Client Identification **COUMI-20190115**
Sampling Date **01/15/19, 08:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	160	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.32	mg/l		0.1			
Total Nitrogen (TKN)	0.267	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.056	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A615**
Client Identification **COUMO-20190115**
Sampling Date **01/15/19, 07:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	150	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.256	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A616**
Client Identification **EVAMS-20190115**
Sampling Date **01/15/19, 14:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	7.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.78	mg/l		0.1			
Total Nitrogen (TKN)	0.207	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.57	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A617**
Client Identification **EVALSS-20190115**
Sampling Date **01/15/19, 13:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	5.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	2.28	mg/l		0.1			
Total Nitrogen (TKN)	0.276	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	2.0	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A618**
Client Identification **MONMN-20190115**
Sampling Date **01/15/19, 09:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	7.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	1.74	mg/l		0.1			
Total Nitrogen (TKN)	0.244	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	1.5	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A619**
Client Identification **MONMS-20190115**
Sampling Date **01/15/19, 09:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.79	mg/l		0.1			
Total Nitrogen (TKN)	0.312	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.48	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A620**
Client Identification **MONM-20190115**
Sampling Date **01/15/19, 11:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	40.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.59	mg/l		0.1			
Total Nitrogen (TKN)	0.162	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.43	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A621**
Client Identification **SEIMN-20190115**
Sampling Date **01/15/19, 12:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.51	mg/l		0.1			
Total Nitrogen (TKN)	0.358	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A622**
Client Identification **SEIMS-20190115**
Sampling Date **01/15/19, 10:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	16.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.51	mg/l		0.1			
Total Nitrogen (TKN)	0.248	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A623**
Client Identification **TOSMI-20190115**
Sampling Date **01/15/19, 14:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	20.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.99	mg/l		0.1			
Total Nitrogen (TKN)	0.134	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.86	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A624**
Client Identification **TOSMO-20190115**
Sampling Date **01/15/19, 08:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	13.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.86	mg/l		0.1			
Total Nitrogen (TKN)	0.227	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.63	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A625**
Client Identification **TYLMI-20190115**
Sampling Date **01/15/19, 09:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	1.21	mg/l		0.1			
Total Nitrogen (TKN)	0.430	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.78	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A626**
Client Identification **TYLMO-20190115**
Sampling Date **01/15/19, 08:50**

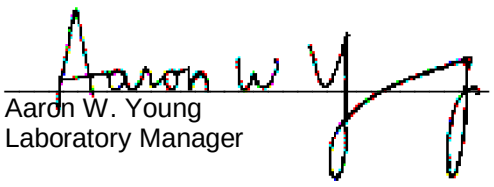
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	5.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.322	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.56	mg/l		0.02	SM4500NO3	JC	01/16/19

AMTEST Identification Number **19-A627**
Client Identification **QA61-20190115**
Sampling Date **01/15/19, 09:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	01/15/19
Total Nitrogen (NOX&TKN)	1.16	mg/l		0.1			
Total Nitrogen (TKN)	0.385	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.78	mg/l		0.02	SM4500NO3	JC	01/16/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
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Professional Analytical Services

QC Summary for sample numbers: 19-A613 to 19-A627

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A591	Fecal coliform	CFU/100 ml	12.	10.	18.
19-A623	Fecal coliform	CFU/100 ml	20.	20.	0.00
19-A627	Fecal coliform	CFU/100 ml	2.	2.	0.00
19-A622	Total Nitrogen (TKN)	mg/l	0.248	0.263	5.9
19-A647	Total Nitrogen (TKN)	mg/l	1.95	1.91	2.1
19-A754	Total Nitrogen (TKN)	mg/l	16.9	13.8	20.
19-A938	Total Nitrogen (TKN)	mg/l	0.351	0.349	0.57
19-A1004	Total Nitrogen (TKN)	mg/l	0.899	0.825	8.6
19-A1014	Total Nitrogen (TKN)	mg/l	0.609	0.659	7.9
19-A399	Total Nitrate + Nitrite	mg/l	0.47	0.47	0.00
19-A603	Total Nitrate + Nitrite	mg/l	0.14	0.12	15.
19-A618	Total Nitrate + Nitrite	mg/l	1.5	1.6	6.5
19-A627	Total Nitrate + Nitrite	mg/l	0.78	0.76	2.6

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A622	Total Nitrogen (TKN)	mg/l	0.248	2.31	2.00	103.10 %
19-A647	Total Nitrogen (TKN)	mg/l	1.95	4.03	2.00	104.00 %
19-A754	Total Nitrogen (TKN)	mg/l	16.9	27.3	10.0	104.00 %
19-A938	Total Nitrogen (TKN)	mg/l	0.351	2.50	2.00	107.45 %
19-A1004	Total Nitrogen (TKN)	mg/l	0.899	3.19	2.00	114.55 %
19-A1014	Total Nitrogen (TKN)	mg/l	0.609	2.87	2.00	113.05 %
19-A375	Total Nitrate + Nitrite	mg/l	0.71	1.7	1.0	99.00 %
19-A399	Total Nitrate + Nitrite	mg/l	0.47	1.6	1.0	113.00 %
19-A603	Total Nitrate + Nitrite	mg/l	0.14	1.1	1.0	96.00 %
19-A618	Total Nitrate + Nitrite	mg/l	1.5	2.5	1.0	100.00 %
19-A627	Total Nitrate + Nitrite	mg/l	0.78	1.9	1.0	112.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.984	98.4 %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrate + Nitrite	mg/l	1.0	0.90	90.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.91	91.0 %

QC Summary for sample numbers: 19-A613 to 19-A627...

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 01-112

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20190115 613	1/15/19	1310	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUM-20190115 14	1/15/19	0810	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190115 15	1/15/19	0740	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190115 16	1/15/19	1405	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190115 17	1/15/19	1345	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190115 18	1/15/19	0935	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190115 19	1/15/19	0955	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190115 20	1/15/19	1105	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190115 21	1/15/19	1215	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190115 22	1/15/19	1030	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	1/15/19	3:40	
Received by:	AMTEST T=7.4	1/15/19	3:40	EDDs - CSV
Relinquished by:				Reporting Limits:
Received by:				Fecal Coliform - 1.0 cfu/100ml
Relinquished by:				Total Nitrogen - .10 mg/L
Received by:				

CLIENT

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

(Standard)

Other: _____

Laboratory Reference #: 01-112

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190115 623	1/15/19	1440	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190115 24	1/15/19	0825	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190115 25	1/15/19	0910	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20190115 26	1/15/19	0850	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA61-20190115 27	1/15/19	0925	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	1/15/19	3:40	EDDs - CSV
Received by:	AMTEST	1/15/19	3:40	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

CLIENT

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 01-112

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0115	01-15-19	1310	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0115		810	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0115		740	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0115		1405	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0115		1345	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0115		935	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0115		955	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0115		1105	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0115		1215	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0115		1030	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0115		1440	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0115		825	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0115		910	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0115		850	Water	7	X	X	X	X	X	X	X	X	X			
15	~~QA 0115~~ QA6120190415	↓	925	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Gretchen Kayser Date 01/15/19 Received by [illegible] Date 1/15/19

Firm Herrera Env. Cn. Time 14:56 Firm OSE Time 1456

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iltner

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No.

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0115	01-15-19	1310	Water	7	x	x	x	x	x	x	x	x	x			
2	COUMI-2019 0115		810	Water	7	x	x	x	x	x	x	x	x	x			
3	COUMO-2019 0115		740	Water	7	x	x	x	x	x	x	x	x	x			
4	EVAMS-2019 0115		1405	Water	7	x	x	x	x	x	x	x	x	x			
5	EVALSS-2019 0115		1345	Water	7	x	x	x	x	x	x	x	x	x			
6	MONMN-2019 0115		935	Water	7	x	x	x	x	x	x	x	x	x			
7	MONMS-2019 0115		955	Water	7	x	x	x	x	x	x	x	x	x			
8	MONM-2019 0115		1105	Water	7	x	x	x	x	x	x	x	x	x			
9	SEIMN-2019 0115		1215	Water	7	x	x	x	x	x	x	x	x	x			
10	SEIMS-2019 0115		1030	Water	7	x	x	x	x	x	x	x	x	x			
11	TOSMI-2019 0115		1440	Water	7	x	x	x	x	x	x	x	x	x			
12	TOSMO-2019 0115		825	Water	7	x	x	x	x	x	x	x	x	x			
13	TYLMI-2019 0115		910	Water	7	x	x	x	x	x	x	x	x	x			
14	TYLMO-2019 0115		850	Water	7	x	x	x	x	x	x	x	x	x			
15	~~DUP~~ ~~0115~~ QA6120190415	↓	925	Water	7	x	x	x	x	x	x	x	x	x			

Relinquished by Gretchen Kaufer Date 01/15/19 Received by Holly Lucy Date 1/15/19

Firm Herrera Env. Con. Time 14:56 Firm OSE Time 1456

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Gwelchen Krueger
Meter:	YSI ProDSS #1
Date/Time:	01/14/19 16:50
Barometric Pressure Start of Day:	mmHg: 763.4 Time: 17:00
Barometric Pressure End of Day:	mmHg: 759.7 Time: 15:30

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.7	0	21.9	
Conductivity (µS/cm)	1008	1,000	22.4	
Conductivity (µS/cm)		100		No cal solution
DO % Saturation	87.1	100	21.6	cal value 100.4

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.5	0	22.0	
Conductivity (µS/cm)	990	1000 100	22.5	No 100 cal solution
DO % Saturation	99.6	100	21.3	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

HERRERA

DAILY TAILGATE SAFETY MEETING FORM – GENERAL FIELD SURVEY RPWS

First Date of Activity: 1/15/19 Time 8:00 Site Locations: RPWS - All

1. [x] Discussed activities planned for the day
2. [x] Individual activities are clear to each crew member
3. [ ] Physical hazards discussed
   - a. [ ] Heat stress
   - b [x] Cold stress
   - c. [x] Slip, trip, and fall hazards
   - d. [x] Water hazards (streams, boats)
   - e [x] Traffic hazards
   - f [x] Remote, forested, or hazardous areas
   - g [ ] Heavy equipment
   - h. [ ] Other
4. [x] Biological hazards discussed
   - a. [ ] Stinging insect allergies
   - b [ ] Other
5. [x] Personal protective equipment (PPE) discussed
   - a. [ ] Head protection (hard hat)
   - b. [ ] Eye protection (safety glasses must have side shields)
   - c. [ ] Hearing protection (at all times when working in or around traffic, heavy equipment)
   - d. [x] Foot protection (steel toes and shanks for work boots)
   - e. [ ] Splash protection (solvent rinse)
   - f [x] Gloves
     - i. [x] Environmental conditions (cold)
     - ii. [x] Protection against cross-contamination (disposal after each use)
     - iii. [x] Physical hazard (cut, puncture, and abrasion)
6. [x] Decontamination procedures discussed
   - a [ ] PPE equipment (rain gear, waders)
   - b [ ] Sampling equipment
7. [x] Emergency procedures discussed
   - a [x] Route to hospital from site locations(s) above
   - b [ ] Evacuation procedures
   - c [x] Cellular phone, map to hospital, first aid kit, and eyewash with Site Health and Safety Officer/Field Lead
8. [x] Special conditions/procedures
   - a [ ] Escort required
   - b. [ ] Locked gates, permits, passes, etc
9. [ ] Questions/concerns addressed
10. [ ] Other

Meeting attended by (sign and date for each day of work on site, **USE BACK IF ADDITIONAL SPACE IS REQUIRED**):

(Print Name)	(Signature)	(Date)
Gretchen Kayser		01/18/19
Darrelle Raquin		1/15/19

Meeting conducted by: Gretchen Kayser (Title)

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + DR

Sample Date: 01/15/19 Sample Time: 1316 PDT:

Base Flow or Storm Event? Field Filtered Time: 1315 PST: X

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy +46°

Water Quality Sampling

Sample ID: COLM20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: Brown

Odor: NA

Sheen:

Floatables: Lots of floatables

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lemch Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.15

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 3.9

Specific Conductivity (µs/cm) 35.6

Dissolved Oxygen (mg/L) 12.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK+DR

Sample Date: 01/15/19 Sample Time: 816 PDT:

Base Flow or Storm Event? Field Filtered Time: 815 PST: X

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy + 36°

Water Quality Sampling

Sample ID: COUM120190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: NA

Sheen: NA

Floatables: V small amount of floatables

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.58 (difficult to tell)

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.1

Specific Conductivity (µs/cm) 300.4

Dissolved Oxygen (mg/L) 12.62

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + DR

Sample Date: 01/15/19 Sample Time: 740 PDT:

Base Flow or Storm Event? Field Filtered Time: 745 PST: X

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Clear/Cloudy 36°

Water Quality Sampling

Sample ID: COUMO20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: NA

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: J. Van Leuven Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement to nearest 100th of a foot

Stream Stage (ft): 1.31

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.3

Specific Conductivity (µs/cm) 263.4

Dissolved Oxygen (mg/L) 12.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK+DR

Sample Date: 01/15/19 Sample Time: 1405 PDT: PST: X

(Base Flow) or Storm Event? Field Filtered Time: 1410

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy +48°

Water Quality Sampling

Sample ID: EVAMS20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: clear

Odor: NA

Sheen: NA

Floatables: some / little amount

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Zeuth Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS4~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.89

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 208.9

Dissolved Oxygen (mg/L) 12.09

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + DR

Sample Date: 01/15/19 Sample Time: 1345 PDT:

Base Flow or Storm Event? Field Filtered Time: 1350 PST: X

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Cloudy +46°

Water Quality Sampling

Sample ID: EVALSS20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Slightly turbid

Color: V. Slightly Yellow

Odor: NA

Sheen: NA

Floatables: Some but not a lot

LABORATORY DELIVERY

Date: Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.33

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.1

Specific Conductivity (µs/cm) 194.6

Dissolved Oxygen (mg/L) 12.42

Quality Assurance

Checked By: John Leuth Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + DR

Sample Date: 01/15/19 Sample Time: 935 PDT:

Base Flow or Storm Event? Field Filtered Time: 940 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny + 36°

Water Quality Sampling

Sample ID: MONMN 20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear / v. little turbid

Color: clear

Odor: NA

Sheen: NO

Floatables: very little amount

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.15 ← 9.15 MM

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.4

Specific Conductivity (µs/cm) 172.2

Dissolved Oxygen (mg/L) 12.50

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + DR

Sample Date: 01/15/19 **Sample Time:** 955 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1000 PST: ✓

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny +36°

Water Quality Sampling

Sample ID: MONMS 20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	clear
Odor:	NA
Sheen:	NA
Floatables:	NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

~~YSI Pro Plus (15D100020)~~

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.80

Reference Point (description): ~~Bottom~~ Top of PVC in vault

Water Quality Measurments

Temperature (°C) 3.4

Specific Conductivity (µs/cm) 310.8

Dissolved Oxygen (mg/L) 10.95

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK+DR

Sample Date: 01/15/19 Sample Time: 1105 PDT:

Base Flow or Storm Event? Field Filtered Time: 1110 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny +37°

Water Quality Sampling

Sample ID: MONM20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	yellowish-brown
Odor:	NA
Sheen:	slight sheen
Floatables:	small amount

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 4.5

Specific Conductivity (µs/cm) 206.3

Dissolved Oxygen (mg/L) 12.86

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK+DR

Sample Date: 01/15/19 **Sample Time:** 1215 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1220

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy 43°

Water Quality Sampling

Sample ID: SEIMN20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: Yellowish brown

Odor: NA

Sheen: NA

Floatables: Yes some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: B. Lee Leath **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.67

Reference Point (description): Top of bolt

Water Quality Measurments

Temperature (°C) 5.7

Specific Conductivity (µs/cm) 68.5

Dissolved Oxygen (mg/L) 12.47

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + DR

Sample Date: 01/15/19 **Sample Time:** 1030 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1035 PST: X

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny + 36°

Water Quality Sampling

Sample ID: SEIMS 20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: yellowish

Odor: NA

Sheen: NA

Floatables: some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lemish **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.74

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.1

Specific Conductivity (µs/cm) 108.9

Dissolved Oxygen (mg/L) 12.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + DR

Sample Date: 01/15/19 Sample Time: 1440 PDT:

Base Flow or Storm Event? Field Filtered Time: 1445 PST: X

(Must filter within 15 minutes of collection)

SITE ID: TOSM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy +48°

Water Quality Sampling

Sample ID: TOSM120190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lentha Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.74

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 306.3

Dissolved Oxygen (mg/L) 11.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Glc + DR

Sample Date: 01/15/19 Sample Time: 825 PDT: PST: X

Base Flow or Storm Event? Field Filtered Time: 830

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Clear + 36°

Water Quality Sampling

Sample ID: TOSMO20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: small bit turbid

Color: yellowish brown

Odor: NA

Sheen: NA

Floatables: yes some

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lovell Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.59

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.7

Specific Conductivity (µs/cm) 268.3

Dissolved Oxygen (mg/L) 12.93

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK+DR

Sample Date: 01/15/19 Sample Time: 910 & 925 PDT:

(Base Flow) or Storm Event? Field Filtered Time: 915 & 930 PST: X

(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Clear + 34°

Water Quality Sampling

Sample ID: TYLM120190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA6\20190115

Filter blank sample ID: ~~QA6\20190115~~

Transfer blank sample ID: ~~QA6\20190115~~

Visual and Olfactory Conditions:

Clarity: Clear

Color: Clear

Odor: NA

Sheen: NA

Floatables: V. little amount

LABORATORY DELIVERY

Date: Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

(YSI Pro DSS 1)

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.55

Reference Point (description): TOP of Culvert Dam

Water Quality Measurments

Temperature (°C) 4.5

Specific Conductivity (µs/cm) 201.1

Dissolved Oxygen (mg/L) 12.22

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 3-29-19 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK+DR

Sample Date: 01/15/19 Sample Time: 850 PDT:

Base Flow or Storm Event? Field Filtered Time: 855 PST: X

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Clear + 36°

Water Quality Sampling

Sample ID: TYLMO20190115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: NA

Sheen: slight sheen

Floatables: NA

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 2-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.87

Reference Point (description): Down from Culvert Top

Water Quality Measurments

Temperature (°C) 3.3

Specific Conductivity (µs/cm) 168.7

Dissolved Oxygen (mg/L) 13.27

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 1/15/2019 / All locations, QA61 (TYLMI) Lab Ref No 1901-112

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	3	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	115	**±20**	8	**≤ 25**	D=1.8	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	4	**≤ 25**	3.9	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	1	**≤180**	≤1.0 mg/L 1.0 mg/L	100,99	**±25**	98	**±15**	1,4	**≤ 20**	1.2	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	3	**≤28**	≤1.0 mg/L 1.0 mg/L	116	**±25**	109	**±15**	2	**≤ 20**	1.8	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	3	**≤28**	≤0.01 mg/L 0.01 mg/L	95	**±25**	97	**±20**	17	**≤ 20**	3.4	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	1-17	**≤28**	≤0.1 mg/L 0.1 mg/L	100-112	**±25**	90-102	**±20**	2.6-6.5	**≤ 20**	11 0	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials 3/28/2019

Sample Date/Sample ID: 1/15/2019 / All locations, QA61 (TYLMI) Lab Ref No 1901-112

date

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	1	**≤180**	≤1.0 µg/L 1.0 µg/L	92,92	**±25**	NR	**±15**	NC, 0	**≤ 20**	0	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	1	**≤180**	≤5.0 µg/L 5.0 µg/L	105,108	**±25**	NR	**±15**	NC,2	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	1	**≤180**	≤1.0 µg/L 1.0 µg/L	83,84	**±25**	NR	**±15**	1,2	**≤ 20**	0	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	1	**≤180**	≤5.0 µg/L 5.0 µg/L	104,106	**±25**	NR	**±15**	NC,2	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	<1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	0	**≤ 35**	NC	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 6, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1901-184

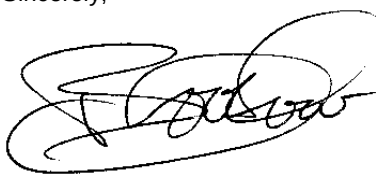
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on January 22, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

Case Narrative

Samples were collected on January 22, 2019 and received by the laboratory on January 22, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190122**					
Laboratory ID:	01-184-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**COUMI-20190122**					
Laboratory ID:	01-184-02					
Total Suspended Solids	**53**	2.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**COUMO-20190122**					
Laboratory ID:	01-184-03					
Total Suspended Solids	**38**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**EVAMS-20190122**					
Laboratory ID:	01-184-04					
Total Suspended Solids	**17**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**EVALSS-20190122**					
Laboratory ID:	01-184-05					
Total Suspended Solids	**47**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**MONMN-20190122**					
Laboratory ID:	01-184-06					
Total Suspended Solids	**48**	2.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**MONMS-20190122**					
Laboratory ID:	01-184-07					
Total Suspended Solids	**1.8**	1.0	SM 2540D	1-23-19	1-24-19	

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190122**					
Laboratory ID:	01-184-08					
Total Suspended Solids	**20**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**SEIMN-20190122**					
Laboratory ID:	01-184-09					
Total Suspended Solids	**21**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**SEIMS-20190122**					
Laboratory ID:	01-184-10					
Total Suspended Solids	**39**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**TOSMI-20190122**					
Laboratory ID:	01-184-11					
Total Suspended Solids	**120**	2.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**TOSMO-20190122**					
Laboratory ID:	01-184-12					
Total Suspended Solids	**80**	2.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**TYLMI-20190122**					
Laboratory ID:	01-184-13					
Total Suspended Solids	**12**	1.0	SM 2540D	1-23-19	1-24-19	
Client ID:	**TYLMO-20190122**					
Laboratory ID:	01-184-14					
Total Suspended Solids	**21**	1.0	SM 2540D	1-23-19	1-24-19	

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA62-20190122**					
Laboratory ID:	01-184-15					
Total Suspended Solids	**16**	1.0	SM 2540D	1-23-19	1-24-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0123W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-23-19	1-24-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-184-02								
	ORIG	DUP							
Total Suspended Solids	**52.8**	**55.2**	NA	NA	NA	NA	4	22	
SPIKE BLANK									
Laboratory ID:	SB0123W1								
	SB		SB		SB				
Total Suspended Solids	**115**		100	NA	115	79-116	NA	NA	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190122**					
Laboratory ID:	01-184-01					
Turbidity	**0.99**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**COUMI-20190122**					
Laboratory ID:	01-184-02					
Turbidity	**29**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**COUMO-20190122**					
Laboratory ID:	01-184-03					
Turbidity	**21**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**EVAMS-20190122**					
Laboratory ID:	01-184-04					
Turbidity	**8.8**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**EVALSS-20190122**					
Laboratory ID:	01-184-05					
Turbidity	**18**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**MONMN-20190122**					
Laboratory ID:	01-184-06					
Turbidity	**27**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**MONMS-20190122**					
Laboratory ID:	01-184-07					
Turbidity	**2.0**	0.10	EPA 180.1	1-23-19	1-23-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190122**					
Laboratory ID:	01-184-08					
Turbidity	**13**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**SEIMN-20190122**					
Laboratory ID:	01-184-09					
Turbidity	**9.8**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**SEIMS-20190122**					
Laboratory ID:	01-184-10					
Turbidity	**14**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**TOSMI-20190122**					
Laboratory ID:	01-184-11					
Turbidity	**40**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**TOSMO-20190122**					
Laboratory ID:	01-184-12					
Turbidity	**43**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**TYLMI-20190122**					
Laboratory ID:	01-184-13					
Turbidity	**9.9**	0.10	EPA 180.1	1-23-19	1-23-19	
Client ID:	**TYLMO-20190122**					
Laboratory ID:	01-184-14					
Turbidity	**13**	0.10	EPA 180.1	1-23-19	1-23-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA62-20190122**					
Laboratory ID:	01-184-15					
Turbidity	**9.7**	0.10	EPA 180.1	1-23-19	1-23-19	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0123W1					
Turbidity	**ND**	0.10	EPA 180.1	1-23-19	1-23-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-184-03								
	ORIG	DUP							
Turbidity	**20.8**	**21.2**	NA	NA	NA	NA	2	15	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190122**					
Laboratory ID:	01-184-01					
Hardness	**11**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**COUMI-20190122**					
Laboratory ID:	01-184-02					
Hardness	**79**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**COUMO-20190122**					
Laboratory ID:	01-184-03					
Hardness	**58**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**EVAMS-20190122**					
Laboratory ID:	01-184-04					
Hardness	**75**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**EVALSS-20190122**					
Laboratory ID:	01-184-05					
Hardness	**73**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**MONMN-20190122**					
Laboratory ID:	01-184-06					
Hardness	**55**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**MONMS-20190122**					
Laboratory ID:	01-184-07					
Hardness	**85**	1.0	200.7/SM 2340B	1-25-19	1-28-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190122**					
Laboratory ID:	01-184-08					
Hardness	**78**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**SEIMN-20190122**					
Laboratory ID:	01-184-09					
Hardness	**25**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**SEIMS-20190122**					
Laboratory ID:	01-184-10					
Hardness	**45**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**TOSMI-20190122**					
Laboratory ID:	01-184-11					
Hardness	**52**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**TOSMO-20190122**					
Laboratory ID:	01-184-12					
Hardness	**65**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**TYLMI-20190122**					
Laboratory ID:	01-184-13					
Hardness	**56**	1.0	200.7/SM 2340B	1-25-19	1-28-19	
Client ID:	**TYLMO-20190122**					
Laboratory ID:	01-184-14					
Hardness	**31**	1.0	200.7/SM 2340B	1-25-19	1-28-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA62-20190122**					
Laboratory ID:	01-184-15					
Hardness	**80**	1.0	200.7/SM 2340B	1-25-19	1-28-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0125WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	1-25-19	1-28-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-184-01										
	ORIG	DUP									
Hardness	**10.9**	**11.4**	NA		NA	NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	01-184-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**139**	**138**	132	132	10.9	97	96	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0125WH1										
	SB		SB			SB					
Hardness	**132**		132		NA	100		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190122**					
Laboratory ID:	01-184-01					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**COUMI-20190122**					
Laboratory ID:	01-184-02					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**COUMO-20190122**					
Laboratory ID:	01-184-03					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**EVAMS-20190122**					
Laboratory ID:	01-184-04					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**EVALSS-20190122**					
Laboratory ID:	01-184-05					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**MONMN-20190122**					
Laboratory ID:	01-184-06					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**MONMS-20190122**					
Laboratory ID:	01-184-07					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	1-24-19	1-24-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190122**					
Laboratory ID:	01-184-08					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**SEIMN-20190122**					
Laboratory ID:	01-184-09					
Dissolved Organic Carbon	**7.6**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**SEIMS-20190122**					
Laboratory ID:	01-184-10					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**TOSMI-20190122**					
Laboratory ID:	01-184-11					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**TOSMO-20190122**					
Laboratory ID:	01-184-12					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**TYLMI-20190122**					
Laboratory ID:	01-184-13					
Dissolved Organic Carbon	**6.8**	1.0	SM 5310B	1-24-19	1-24-19	
Client ID:	**TYLMO-20190122**					
Laboratory ID:	01-184-14					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	1-24-19	1-24-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA62-20190122**					
Laboratory ID:	01-184-15					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	1-24-19	1-24-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0124D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	1-24-19	1-24-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-184-01								
	ORIG	DUP							
Dissolved Organic Carbon	**13.1**	**13.3**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	01-184-01								
	MS		MS		MS				
Dissolved Organic Carbon	**23.9**		10.0	13.1	108	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0124D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.93**		10.0	NA	99	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190122**					
Laboratory ID:	01-184-01					
Total Phosphorus	**0.017**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**COUMI-20190122**					
Laboratory ID:	01-184-02					
Total Phosphorus	**0.14**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**COUMO-20190122**					
Laboratory ID:	01-184-03					
Total Phosphorus	**0.10**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**EVAMS-20190122**					
Laboratory ID:	01-184-04					
Total Phosphorus	**0.044**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**EVALSS-20190122**					
Laboratory ID:	01-184-05					
Total Phosphorus	**0.076**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**MONMN-20190122**					
Laboratory ID:	01-184-06					
Total Phosphorus	**0.15**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**MONMS-20190122**					
Laboratory ID:	01-184-07					
Total Phosphorus	**0.032**	0.010	EPA 365.1	1-25-19	1-28-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190122**					
Laboratory ID:	01-184-08					
Total Phosphorus	**0.073**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**SEIMN-20190122**					
Laboratory ID:	01-184-09					
Total Phosphorus	**0.054**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**SEIMS-20190122**					
Laboratory ID:	01-184-10					
Total Phosphorus	**0.092**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**TOSMI-20190122**					
Laboratory ID:	01-184-11					
Total Phosphorus	**0.13**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**TOSMO-20190122**					
Laboratory ID:	01-184-12					
Total Phosphorus	**0.17**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**TYLMI-20190122**					
Laboratory ID:	01-184-13					
Total Phosphorus	**0.063**	0.010	EPA 365.1	1-25-19	1-28-19	
Client ID:	**TYLMO-20190122**					
Laboratory ID:	01-184-14					
Total Phosphorus	**0.066**	0.010	EPA 365.1	1-25-19	1-28-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA62-20190122**					
Laboratory ID:	01-184-15					
Total Phosphorus	**0.042**	0.010	EPA 365.1	1-25-19	1-28-19	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0125W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	1-25-19	1-28-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-184-01								
	ORIG	DUP							
Total Phosphorus	**0.0167**	**0.0159**	NA	NA	NA	NA	5	12	
MATRIX SPIKE									
Laboratory ID:	01-184-01								
	MS		MS		MS				
Total Phosphorus	**0.250**		0.250	0.0167	93	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0125W1								
	SB		SB		SB				
Total Phosphorus	**0.231**		0.250	NA	92	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190122**					
Laboratory ID:	01-184-01					
Copper	**ND**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**ND**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**COUMI-20190122**					
Laboratory ID:	01-184-02					
Copper	**3.6**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**33**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**COUMO-20190122**					
Laboratory ID:	01-184-03					
Copper	**4.3**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**35**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**EVAMS-20190122**					
Laboratory ID:	01-184-04					
Copper	**ND**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**ND**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**EVALSS-20190122**					
Laboratory ID:	01-184-05					
Copper	**1.8**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**7.1**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**MONMN-20190122**					
Laboratory ID:	01-184-06					
Copper	**2.6**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**19**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**MONMS-20190122**					
Laboratory ID:	01-184-07					
Copper	**1.9**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**7.6**	5.0	EPA 200.8	1-28-19	2-1-19	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190122**					
Laboratory ID:	01-184-08					
Copper	**1.7**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**22**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**SEIMN-20190122**					
Laboratory ID:	01-184-09					
Copper	**1.2**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**ND**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**SEIMS-20190122**					
Laboratory ID:	01-184-10					
Copper	**1.0**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**27**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**TOSMI-20190122**					
Laboratory ID:	01-184-11					
Copper	**8.7**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**290**	10	EPA 200.8	1-28-19	2-1-19	
Client ID:	**TOSMO-20190122**					
Laboratory ID:	01-184-12					
Copper	**7.7**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**240**	10	EPA 200.8	1-28-19	2-1-19	
Client ID:	**TYLMI-20190122**					
Laboratory ID:	01-184-13					
Copper	**4.0**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**9.5**	5.0	EPA 200.8	1-28-19	2-1-19	
Client ID:	**TYLMO-20190122**					
Laboratory ID:	01-184-14					
Copper	**5.0**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**19**	5.0	EPA 200.8	1-28-19	2-1-19	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA62-20190122**					
Laboratory ID:	01-184-15					
Copper	**1.0**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**ND**	5.0	EPA 200.8	1-28-19	2-1-19	

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0128WH2					
Copper	**ND**	1.0	EPA 200.8	1-28-19	2-1-19	
Zinc	**ND**	5.0	EPA 200.8	1-28-19	2-1-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-184-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-184-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**92.8**	**86.0**	100	100	ND	**93**	**86**	75-125	8	20	
Zinc	**98.6**	**93.8**	100	100	ND	**99**	**94**	75-125	5	20	

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190122**					
Laboratory ID:	01-184-01					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	
Client ID:	**COUMI-20190122**					
Laboratory ID:	01-184-02					
Copper	**1.8**	1.0	EPA 200.8		2-1-19	
Zinc	**13**	5.0	EPA 200.8		2-1-19	
Client ID:	**COUMO-20190122**					
Laboratory ID:	01-184-03					
Copper	**2.1**	1.0	EPA 200.8		2-1-19	
Zinc	**12**	5.0	EPA 200.8		2-1-19	
Client ID:	**EVAMS-20190122**					
Laboratory ID:	01-184-04					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	
Client ID:	**EVALSS-20190122**					
Laboratory ID:	01-184-05					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	
Client ID:	**MONMN-20190122**					
Laboratory ID:	01-184-06					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**6.5**	5.0	EPA 200.8		2-1-19	
Client ID:	**MONMS-20190122**					
Laboratory ID:	01-184-07					
Copper	**1.1**	1.0	EPA 200.8		2-1-19	
Zinc	**6.6**	5.0	EPA 200.8		2-1-19	

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190122**					
Laboratory ID:	01-184-08					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**11**	5.0	EPA 200.8		2-1-19	
Client ID:	**SEIMN-20190122**					
Laboratory ID:	01-184-09					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	
Client ID:	**SEIMS-20190122**					
Laboratory ID:	01-184-10					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	
Client ID:	**TOSMI-20190122**					
Laboratory ID:	01-184-11					
Copper	**4.6**	1.0	EPA 200.8		2-1-19	
Zinc	**200**	5.0	EPA 200.8		2-1-19	
Client ID:	**TOSMO-20190122**					
Laboratory ID:	01-184-12					
Copper	**2.6**	1.0	EPA 200.8		2-1-19	
Zinc	**80**	5.0	EPA 200.8		2-1-19	
Client ID:	**TYLMI-20190122**					
Laboratory ID:	01-184-13					
Copper	**2.4**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	
Client ID:	**TYLMO-20190122**					
Laboratory ID:	01-184-14					
Copper	**2.0**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA62-20190122**					
Laboratory ID:	01-184-15					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	

Date of Report: February 6, 2019
Samples Submitted: January 22, 2019
Laboratory Reference: 1901-184
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201D1					
Copper	**ND**	1.0	EPA 200.8		2-1-19	
Zinc	**ND**	5.0	EPA 200.8		2-1-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-184-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-184-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**69.4**	**72.2**	80.0	80.0	ND	**87**	**90**	75-125	4	20	
Zinc	**84.2**	**86.6**	80.0	80.0	ND	**105**	**108**	75-125	3	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 6 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: BLAIR GOODROW

Dear BLAIR GOODROW:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190122	Water	19-A930	Micro, NUT
COUMI-20190122	Water	19-A931	Micro, NUT
COUMO-20190122	Water	19-A932	Micro, NUT
EVAMS-20190122	Water	19-A933	Micro, NUT
EVALSS-20190122	Water	19-A934	Micro, NUT
MONMN-20190122	Water	19-A935	Micro, NUT
MONMS-20190122	Water	19-A936	Micro, NUT
MONM-20190122	Water	19-A937	Micro, NUT
SEIMN-20190122	Water	19-A938	Micro, NUT
SEIMS-20190122	Water	19-A939	Micro, NUT
TOSMI-20190122	Water	19-A940	Micro, NUT
TOSMO-20190122	Water	19-A941	Micro, NUT
TYLMI-20190122	Water	19-A942	Micro, NUT
TYLMO-20190122	Water	19-A943	Micro, NUT
QA62-20190122	Water	19-A944	Micro, NUT

Your samples were received on Wednesday, January 23, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

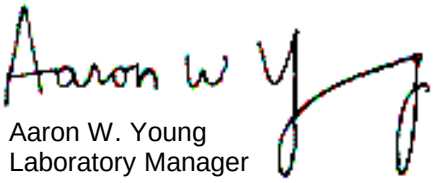
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 6 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 01-184

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Suite C
Kirkland, WA 98034
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www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: BLAIR GOODROW
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 01-184
All results reported on an as received basis.

Date Received: 01/23/19
Date Reported: 2/ 6/19

AMTEST Identification Number **19-A930**
Client Identification **COLM-20190122**
Sampling Date **01/22/19, 19:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	20.	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.48	mg/l		0.1			
Total Nitrogen (TKN)	0.398	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.079	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A931**
Client Identification **COUMI-20190122**
Sampling Date **01/22/19, 16:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	42.	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.523	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.22	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A932**
Client Identification **COUMO-20190122**
Sampling Date **01/22/19, 15:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.592	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A933**
Client Identification **EVAMS-20190122**
Sampling Date **01/22/19, 16:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	2.28	mg/l		0.1			
Total Nitrogen (TKN)	0.576	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	1.7	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A934**
Client Identification **EVALSS-20190122**
Sampling Date **01/22/19, 16:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	2.24	mg/l		0.1			
Total Nitrogen (TKN)	0.737	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	1.5	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A935**
Client Identification **MONMN-20190122**
Sampling Date **01/22/19, 18:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	33.	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	1.06	mg/l		0.1			
Total Nitrogen (TKN)	0.739	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.32	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A936**
Client Identification **MONMS-20190122**
Sampling Date **01/22/19, 18:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	94.	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.53	mg/l		0.1			
Total Nitrogen (TKN)	0.234	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.30	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A937**
Client Identification **MONM-20190122**
Sampling Date **01/22/19, 18:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	50.	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.78	mg/l		0.1			
Total Nitrogen (TKN)	0.450	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.33	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A938**
Client Identification **SEIMN-20190122**
Sampling Date **01/22/19, 19:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	96.	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.351	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A939**
Client Identification **SEIMS-20190122**
Sampling Date **01/22/19, 17:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	150	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.633	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.25	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A940**
Client Identification **TOSMI-20190122**
Sampling Date **01/22/19, 15:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1900	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	1.46	mg/l		0.1			
Total Nitrogen (TKN)	0.708	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.75	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A941**
Client Identification **TOSMO-20190122**
Sampling Date **01/22/19, 16:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	860	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	1.45	mg/l		0.1			
Total Nitrogen (TKN)	0.821	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.63	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A942**
Client Identification **TYLMI-20190122**
Sampling Date **01/22/19, 19:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	20.	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	1.14	mg/l		0.1			
Total Nitrogen (TKN)	0.539	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.60	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A943**
Client Identification **TYLMO-20190122**
Sampling Date **01/22/19, 19:20**

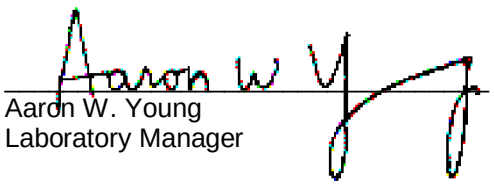
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	160	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	0.56	mg/l		0.1			
Total Nitrogen (TKN)	0.296	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	SRW	01/30/19

AMTEST Identification Number **19-A944**
Client Identification **QA62-20190122**
Sampling Date **01/22/19, 16:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		1	SM 9222D	JM	01/23/19
Total Nitrogen (NOX&TKN)	2.44	mg/l		0.1			
Total Nitrogen (TKN)	0.639	mg/l		0.2	SM4500N	MJ	02/01/19
Total Nitrate + Nitrite	1.8	mg/l		0.02	SM4500NO3	SRW	01/30/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
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Kirkland, WA, 98034
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Professional Analytical Services

QC Summary for sample numbers: 19-A930 to 19-A944

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A930	Fecal coliform	CFU/100 ml	20.	11.	58.
19-A944	Fecal coliform	CFU/100 ml	200	160	22.
19-A622	Total Nitrogen (TKN)	mg/l	0.248	0.263	5.9
19-A647	Total Nitrogen (TKN)	mg/l	1.95	1.91	2.1
19-A754	Total Nitrogen (TKN)	mg/l	16.9	13.8	20.
19-A938	Total Nitrogen (TKN)	mg/l	0.351	0.349	0.57
19-A1004	Total Nitrogen (TKN)	mg/l	0.899	0.825	8.6
19-A1014	Total Nitrogen (TKN)	mg/l	0.609	0.659	7.9
19-A939	Total Nitrate + Nitrite	mg/l	0.25	0.25	0.00
19-A963	Total Nitrate + Nitrite	mg/l	0.028	0.023	20.
19-A982	Total Nitrate + Nitrite	mg/l	3.0	2.9	3.4
19-A1016	Total Nitrate + Nitrite	mg/l	0.76	0.76	0.00
19-A1062	Total Nitrate + Nitrite	mg/l	0.042	0.042	0.00
19-A1095	Total Nitrate + Nitrite	mg/l	8.3	8.2	1.2

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A622	Total Nitrogen (TKN)	mg/l	0.248	2.31	2.00	103.10 %
19-A647	Total Nitrogen (TKN)	mg/l	1.95	4.03	2.00	104.00 %
19-A754	Total Nitrogen (TKN)	mg/l	16.9	27.3	10.0	104.00 %
19-A938	Total Nitrogen (TKN)	mg/l	0.351	2.50	2.00	107.45 %
19-A1004	Total Nitrogen (TKN)	mg/l	0.899	3.19	2.00	114.55 %
19-A1014	Total Nitrogen (TKN)	mg/l	0.609	2.87	2.00	113.05 %
19-A939	Total Nitrate + Nitrite	mg/l	0.25	1.3	1.0	105.00 %
19-A963	Total Nitrate + Nitrite	mg/l	0.028	1.1	1.0	107.20 %
19-A982	Total Nitrate + Nitrite	mg/l	3.0	8.4	5.0	108.00 %
19-A1016	Total Nitrate + Nitrite	mg/l	0.76	1.8	1.0	104.00 %
19-A1062	Total Nitrate + Nitrite	mg/l	0.042	1.1	1.0	105.80 %
19-A1095	Total Nitrate + Nitrite	mg/l	8.3	28.	20.	98.50 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.984	98.4 %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %

QC Summary for sample numbers: 19-A930 to 19-A944...

BLANKS

ANALYTE	UNITS	RESULT
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrogen (TKN)	mg/l	< 0.1
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01
Total Nitrate + Nitrite	mg/l	< 0.01

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 01-184

Laboratory: AmTest Laboratories
Attention: Aaron Young
13600 NE 126th Pl Kirkland, WA 98034
Phone Number: (425) 885-1664

Turnaround Request
1 Day 2 Day 3 Day
Standard
Other: _____

Project Manager: Blair Goodrow
email: bgoodrow@onsite-env.com
Project Number: 14-05806-000
Project Name: Redmond Paired Watershed Study

	Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
930	1	COLM-20190122	1/22/19	19:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
931	2	COUMI-20190122	1/22/19	16:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
932	3	COUMO-20190122	1/22/19	15:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
933	4	EVAMS-20190122	1/22/19	16:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
934	5	EVALSS-20190122	1/22/19	16:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
935	6	MONMN-20190122	1/22/19	18:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
936	7	MONMS-20190122	1/22/19	18:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
937	8	MONM-20190122	1/22/19	18:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
938	9	SEIMN-20190122	1/22/19	19:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
939	10	SEIMS-20190122	1/22/19	17:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	1/23/19	725	
Received by:	AmTest	1/23/19	725	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

T=8.0

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 01-184

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

(Standard)

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

	Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
940	11	TOSMI-20190122	1/22/19	15:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
941	12	TOSMO-20190122	1/22/19	16:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
942	13	TYLMI-20190122	1/22/19	19:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
943	14	TYLMO-20190122	1/22/19	19:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
944	15	QA62-20190122	1/22/19	16:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	1/23/19	725	EDDs - CSV
Received by:	AmTest	1/23/19	725	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 01-184

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2018 0122	012219	1940	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 0122		1610	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 0122		1550	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 0122		1625	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 0122		1650	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 0122		1820	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 0122		1840	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 0122		1900	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 0122		1940	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 0122		1745	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 0122		1545	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 0122		1640	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 0122		1900	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 0122		1920	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 02-2019 0122		1635	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 012219 Received by _____ Date 1/22/19

Firm Herrera Time 20:40 Firm OnSite Env Time 2040

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

* TYLMO → 500 mL bottle has missing label (too wet to read)

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Laboratory No. 01-184

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0122	012219	1940	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0122		1610	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0122		1550	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0122		1625	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0122		1650	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0122		1820	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0122		1840	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0122		1900	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0122		1940	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0122		1745	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0122		1545	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0122		1640	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0122		1900	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0122		1920	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 62-2019 0122		1635	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 012219 Received by _____ Date 1/22/19
Firm Herrera Time 2040 Firm _____ Time 2040
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

* TYLMO → 500 mL bottle has missing label (too wet to read)

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Mullen
Meter:	YSI Pro Plus
Date/Time:	1.22.19 14:45
Barometric Pressure Start of Day:	mmHg: 764.9 Time: 14:45
Barometric Pressure End of Day:	mmHg: 763.2 Time: 8:15 / 1.23.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.4	0	23.0	Herrera DI water
Conductivity (µS/cm)	1007	1,000	23.4	
Conductivity (µS/cm)		100		out
DO % Saturation	76.7	100	23.3	calibrated new: 99.8

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	22.4	Herrera DI water
Conductivity (µS/cm)		100		out
DO % Saturation	94.5	100		not steady

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muilen
Meter:	USI Dro PSS #1
Date/Time:	1.22.19 1A:45
Barometric Pressure Start of Day:	mmHg: 778.5 Time: 1A:45
Barometric Pressure End of Day:	mmHg: 769.0 Time: 8:15/1.23.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.1	0	22.5	Herrera DI water
Conductivity (µS/cm)	995	1,000	22.9	
Conductivity (µS/cm)		~~100~~		out
DO % Saturation	101.6	100	22.4	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.9	0	22.2	Herrera DI water
Conductivity (µS/cm)		~~100~~		out
DO % Saturation	102.0	100	21.3	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + KB

Sample Date: 1.22.19 **Sample Time:** 1940 PDT: PST: X

Base Flow or Storm Event? B **Field Filtered Time:** 1945
(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40

Water Quality Sampling

Sample ID: COLM 20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NG
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	clear
Color:	tannin
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.72

Reference Point (description): SG

Water Quality Measurments

Temperature (°C)	6.5	5.0
Specific Conductivity (µs/cm)	~~131.0~~	35.0
Dissolved Oxygen (mg/L)	~~11.00~~	11.96

Quality Assurance

Checked By: J. Lee L. Lee **Signature:**

Date Checked: 3-29-19 **Time:**

Data Entered into Database? YES ✓ NO **initials:**

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 01/22/19 **Sample Time:** 1550 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1555

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy +44°

Water Quality Sampling

Sample ID: COUMO-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: bit turbid

Color: light brownish

Odor: NA

Sheen: NA

Floatables: very minimal

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.42

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.0

Specific Conductivity (µs/cm) 141.2

Dissolved Oxygen (mg/L) 12.01

60

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: C GK

Sample Date: 01/22/19 **Sample Time:** 1610 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1615 PST: X

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 44° + Rainy

Water Quality Sampling

Sample ID: COUM1-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: little turbid

Color: clear

Odor: NA

Sheen: NA

Floatables: some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.68

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.0

Specific Conductivity (µs/cm) 192.6

Dissolved Oxygen (mg/L) 12.06

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Geiger T Prescott MM+KB

Sample Date: ~~1/3/19~~ 9.22.19 **Sample Time:** 16:25 | 16:35 PDT

Base Flow or Storm Event? Storm **Field Filtered Time:** 16:39 16:49 PST

(Must filter within 15 minutes of collection)

SITE ID: ~~EOUMS~~ EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rain 48°

HERRERA

Water Quality Sampling

Sample ID: ~~EOUMS - 20190103~~ EVAMS - 20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	QA02 - 20190122
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none none
Odor:	none
Sheen:	none foam
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Shannon Cottell **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020) Y
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): Sig

Reference Point (description): 3.92

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 182.4

Dissolved Oxygen (mg/L) 11.83

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Good T Prescott MM KB

Sample Date: 4/3/19 1.22.19 **Sample Time:** 10:50 PDT: / PST

Base Flow or Storm Event? (Storm)

Field Filtered Time: 10:55
(Must filter within 15 minutes of collection)

SITE ID: ~~TOSMO~~ EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40

Water Quality Sampling

Sample ID: ~~TOSMO-20190103~~ EVALSS-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NC
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	=
Filter blank sample ID:	=
Transfer blank sample ID:	=

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	non
Floatables:	some foam

LABORATORY DELIVERY

Date: **Time:**

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.36

Reference Point (description): RB SG

Water Quality Measurments

Temperature (°C) 7.2

Specific Conductivity (µs/cm) 110.8

Dissolved Oxygen (mg/L) 12.90

Quality Assurance

Checked By: Blair Leath **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: ~~J Gorge T Prescott~~ MM + KB

Sample Date: ~~1.22.19~~ 1.22.19 **Sample Time:** 18:20 PDT

Base Flow or Storm Event? **Field Filtered Time:** 18:25 PST

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: MONMN-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Brian Lowe **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020) ← wrong MM
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.28

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.1

Specific Conductivity (µs/cm) 142.0

Dissolved Oxygen (mg/L) 12.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: ~~MM+KB~~ ~~J Gough + Prasch~~ MM+KB

Sample Date: ~~1-22-19~~ 1-22-19 **Sample Time:** 18:40 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 18:45

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: MONMS - ~~20190103~~ 20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Blake Lentz **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.70

Reference Point (description): top of PVC pipe

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 228.8

Dissolved Oxygen (mg/L) 11.15

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 01/22/19 **Sample Time:** 1800 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1805 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MoNM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy +44°

Water Quality Sampling

Sample ID: MoNM-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: none

Sheen: none

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Brian Lentz **Signature:**

Date Checked: 3-29-19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 0.7

Specific Conductivity (µs/cm) 189.7

Dissolved Oxygen (mg/L) 12.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM KB

Sample Date: 1.22.19 **Sample Time:** 1940 PDT: PST: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 1945

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40

Water Quality Sampling

Sample ID: SEIMN - 20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	JC
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	=
Filter blank sample ID:	=
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	none clear
Color:	none
Odor:	~~clear~~ none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Edward Laurel **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020) X
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.63

Reference Point (description): top of bolt on side

Water Quality Measurments

Temperature (°C) 6.0

Specific Conductivity (µs/cm) 61.6

Dissolved Oxygen (mg/L) 11.30

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J Forgo T Prescott MM + KB

Sample Date: 1/3/19 1.22.19 **Sample Time:** 17:45 PDT

Base Flow or Storm Event? **Field Filtered Time:** 17:50 PST
(Must filter within 15 minutes of collection)

SITE ID: ~~T-Y-LM0~~ SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 43°

Water Quality Sampling

Sample ID: ~~TYLM0-20190103~~ SEIMS-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	=
Filter blank sample ID:	=
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sara Lentz **Signature:**

Date Checked: 3-27-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020) X
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): SG

Reference Point (description): 0.94

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 104.0

Dissolved Oxygen (mg/L) 10.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: ~~J Gogol T Prescott~~ MM KB

Sample Date: ~~1/3/19~~ 1.22.19 **Sample Time:** 15:45 PDT: ☐

Base Flow or Storm Event? (0) **Field Filtered Time:** 15:50 PST: ☐

(Must filter within 15 minutes of collection)

SITE ID: ~~CD700~~ TOSM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 48°

Water Quality Sampling

Sample ID: ~~CDMS-20190103~~ TOSM1-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	brown
Odor:	None
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sylvia Lemly **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020) X
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.4

Reference Point (description): 0.90

Water Quality Measurments

Temperature (°C) 8.7

Specific Conductivity (µs/cm) 128.9

Dissolved Oxygen (mg/L) 10.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 01/22/19 **Sample Time:** 1640 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1645 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 44°

Water Quality Sampling

Sample ID: TOSMO-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Yellowish
Color:	turbid
Odor:	NA
Sheen:	NA
Floatables:	lots

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sabrina Lentz **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.85

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.3

Specific Conductivity (µs/cm) 143.9

Dissolved Oxygen (mg/L) 12.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: ~~J. Gore, T. Prescott~~ MM + KB

Sample Date: ~~1/3/19~~ 1.22.19 **Sample Time:** 19:00 PDT

Base Flow or Storm Event? **Field Filtered Time:** 19:05 PST

(Must filter within 15 minutes of collection)

SITE ID: TYLMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: ~~TYLMI-20190103~~ TYLMI-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NC
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	-
Filter blank sample ID:	-
Transfer blank sample ID:	-

Visual and Olfactory Conditions:

Clarity:	clear
Color:	red deposit @ culv. mouth
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Zahra Lauth **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.40

Reference Point (description): top of culvert down

Water Quality Measurments

Temperature (°C) 6.5

Specific Conductivity (µs/cm) 131.8

Dissolved Oxygen (mg/L) 11.58

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 01/22/19 **Sample Time:** 1720 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1725 PST: X

(Must filter within 15 minutes of collection)

SITE ID: + YLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy +44°

Water Quality Sampling

Sample ID: TYLMO-20190122

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	bit turbid
Color:	yellow
Odor:	NA
Sheen:	NA
Floatables:	yes

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- ~~YSI Pro DSS 1~~
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~2~~ 2.75

Reference Point (description): Down from Top of Culvert

Water Quality Measurments

Temperature (°C) 6.3

Specific Conductivity (µs/cm) 74.3

Dissolved Oxygen (mg/L) 12.26

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 1/22/2019 / All locations, QA62 (EVAMS) Lab Ref No 1901-184

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	2	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	115	**±20**	4	**≤ 25**	6.1	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	2	**≤ 25**	9.7	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	6	**≤180**	≤1.0 mg/L 1.0 mg/L	97,96	**±25**	100	**±15**	1,4	**≤ 20**	6.4	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	2	**≤28**	≤1.0 mg/L 1.0 mg/L	108	**±25**	99	**±15**	2	**≤ 20**	2.4	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6	**≤28**	≤0.01 mg/L 0.01 mg/L	93	**±25**	92	**±20**	5	**≤ 20**	4.6	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	8-10	**≤28**	≤0.1 mg/L 0.1 mg/L	107,105	**±25**	98-102	**±20**	0,0.6	**≤ 20**	D= 0.063 5.7	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/4/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 1/22/2019 / All locations, QA62 (EVAMS) Lab Ref No 1901-184

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	10	**≤180**	≤1.0 µg/L 1.0 µg/L	93,86	**±25**	NR	**±15**	NC.8	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	10	**≤180**	≤5.0 µg/L 5.0 µg/L	99,94	**±25**	NR	**±15**	NC,5,2	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	10	**≤180**	≤1.0 µg/L 1.0 µg/L	87,90	**±25**	NR	**±15**	NC,4	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	10	**≤180**	≤5.0 µg/L 5.0 µg/L	105,108	**±25**	NR	**±15**	NC,3	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	58 22	**≤ 35**	0	**≤ 50**	OK	FLAG COLM J DUE TO LAB DUP RPD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 19, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1902-005

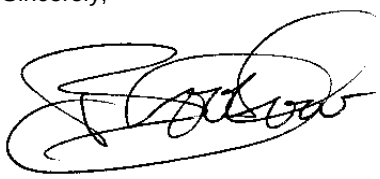
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on February 1, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

Case Narrative

Samples were collected on February 1, 2019 and received by the laboratory on February 1, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190201**					
Laboratory ID:	02-005-01					
Total Suspended Solids	**1.6**	1.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**COUMI-20190201**					
Laboratory ID:	02-005-02					
Total Suspended Solids	**120**	2.5	SM 2540D	2-5-19	2-6-19	
Client ID:	**COUMO-20190201**					
Laboratory ID:	02-005-03					
Total Suspended Solids	**51**	1.7	SM 2540D	2-5-19	2-6-19	
Client ID:	**EVAMS-20190201**					
Laboratory ID:	02-005-04					
Total Suspended Solids	**14**	1.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**EVALSS-20190201**					
Laboratory ID:	02-005-05					
Total Suspended Solids	**30**	1.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**MONMN-20190201**					
Laboratory ID:	02-005-06					
Total Suspended Solids	**13**	1.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**MONMS-20190201**					
Laboratory ID:	02-005-07					
Total Suspended Solids	**2.6**	1.0	SM 2540D	2-5-19	2-6-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190201**					
Laboratory ID:	02-005-08					
Total Suspended Solids	**22**	1.7	SM 2540D	2-5-19	2-6-19	
Client ID:	**SEIMN-20190201**					
Laboratory ID:	02-005-09					
Total Suspended Solids	**18**	1.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**SEIMS-20190201**					
Laboratory ID:	02-005-10					
Total Suspended Solids	**46**	1.7	SM 2540D	2-5-19	2-6-19	
Client ID:	**TOSMI-20190201**					
Laboratory ID:	02-005-11					
Total Suspended Solids	**280**	5.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**TOSMO-20190201**					
Laboratory ID:	02-005-12					
Total Suspended Solids	**140**	5.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**TYLMI-20190201**					
Laboratory ID:	02-005-13					
Total Suspended Solids	**12**	1.0	SM 2540D	2-5-19	2-6-19	
Client ID:	**TYLMO-20190201**					
Laboratory ID:	02-005-14					
Total Suspended Solids	**130**	5.0	SM 2540D	2-5-19	2-6-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA64-20190201**					
Laboratory ID:	02-005-16					
Total Suspended Solids	**3.4**	1.0	SM 2540D	2-5-19	2-6-19	

Date of Report: February 19, 2019
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TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0205W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	2-5-19	2-6-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-005-02								
	ORIG	DUP							
Total Suspended Solids	**117**	**119**	NA	NA	NA	NA	2	22	
SPIKE BLANK									
Laboratory ID:	SB0205W1								
	SB		SB		SB				
Total Suspended Solids	**86.0**		100	NA	86	79-116	NA	NA	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190201**					
Laboratory ID:	02-005-01					
Turbidity	**1.0**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**COUMI-20190201**					
Laboratory ID:	02-005-02					
Turbidity	**61**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**COUMO-20190201**					
Laboratory ID:	02-005-03					
Turbidity	**28**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**EVAMS-20190201**					
Laboratory ID:	02-005-04					
Turbidity	**7.3**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**EVALSS-20190201**					
Laboratory ID:	02-005-05					
Turbidity	**13**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**MONMN-20190201**					
Laboratory ID:	02-005-06					
Turbidity	**8.9**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**MONMS-20190201**					
Laboratory ID:	02-005-07					
Turbidity	**2.9**	0.10	EPA 180.1	2-1-19	2-1-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190201**					
Laboratory ID:	02-005-08					
Turbidity	**15**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**SEIMN-20190201**					
Laboratory ID:	02-005-09					
Turbidity	**8.6**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**SEIMS-20190201**					
Laboratory ID:	02-005-10					
Turbidity	**20**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**TOSMI-20190201**					
Laboratory ID:	02-005-11					
Turbidity	**73**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**TOSMO-20190201**					
Laboratory ID:	02-005-12					
Turbidity	**76**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**TYLMI-20190201**					
Laboratory ID:	02-005-13					
Turbidity	**9.7**	0.10	EPA 180.1	2-1-19	2-1-19	
Client ID:	**TYLMO-20190201**					
Laboratory ID:	02-005-14					
Turbidity	**75**	0.10	EPA 180.1	2-1-19	2-1-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA64-20190201**					
Laboratory ID:	02-005-16					
Turbidity	**3.4**	0.10	EPA 180.1	2-1-19	2-1-19	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201W1					
Turbidity	**ND**	0.10	EPA 180.1	2-1-19	2-1-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-001-01								
	ORIG	DUP							
Turbidity	**55.5**	**58.7**	NA	NA	NA	NA	6	15	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190201**					
Laboratory ID:	02-005-01					
Hardness	**11**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**COUMI-20190201**					
Laboratory ID:	02-005-02					
Hardness	**81**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**COUMO-20190201**					
Laboratory ID:	02-005-03					
Hardness	**69**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**EVAMS-20190201**					
Laboratory ID:	02-005-04					
Hardness	**82**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**EVALSS-20190201**					
Laboratory ID:	02-005-05					
Hardness	**76**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**MONMN-20190201**					
Laboratory ID:	02-005-06					
Hardness	**79**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**MONMS-20190201**					
Laboratory ID:	02-005-07					
Hardness	**110**	1.0	200.7/SM 2340B	2-8-19	2-8-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190201**					
Laboratory ID:	02-005-08					
Hardness	**77**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**SEIMN-20190201**					
Laboratory ID:	02-005-09					
Hardness	**25**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**SEIMS-20190201**					
Laboratory ID:	02-005-10					
Hardness	**44**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**TOSMI-20190201**					
Laboratory ID:	02-005-11					
Hardness	**82**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**TOSMO-20190201**					
Laboratory ID:	02-005-12					
Hardness	**96**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**TYLMI-20190201**					
Laboratory ID:	02-005-13					
Hardness	**87**	1.0	200.7/SM 2340B	2-8-19	2-8-19	
Client ID:	**TYLMO-20190201**					
Laboratory ID:	02-005-14					
Hardness	**41**	1.0	200.7/SM 2340B	2-8-19	2-8-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA64-20190201**					
Laboratory ID:	02-005-16					
Hardness	**110**	1.0	200.7/SM 2340B	2-8-19	2-8-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0211WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	2-8-19	2-8-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-005-07										
	ORIG	DUP									
Hardness	**111**	**116**	NA		NA	NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	02-005-07										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**238**	**241**	132	132	111	96	98	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0211WH1										
	SB		SB			SB					
Hardness	**138**		132		NA	105		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190201**					
Laboratory ID:	02-005-01					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**COUMI-20190201**					
Laboratory ID:	02-005-02					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**COUMO-20190201**					
Laboratory ID:	02-005-03					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**EVAMS-20190201**					
Laboratory ID:	02-005-04					
Dissolved Organic Carbon	**3.5**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**EVALSS-20190201**					
Laboratory ID:	02-005-05					
Dissolved Organic Carbon	**3.3**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**MONMN-20190201**					
Laboratory ID:	02-005-06					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**MONMS-20190201**					
Laboratory ID:	02-005-07					
Dissolved Organic Carbon	**4.6**	1.0	SM 5310B	2-12-19	2-12-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190201**					
Laboratory ID:	02-005-08					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**SEIMN-20190201**					
Laboratory ID:	02-005-09					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**SEIMS-20190201**					
Laboratory ID:	02-005-10					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**TOSMI-20190201**					
Laboratory ID:	02-005-11					
Dissolved Organic Carbon	**6.8**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**TOSMO-20190201**					
Laboratory ID:	02-005-12					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**TYLMI-20190201**					
Laboratory ID:	02-005-13					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**TYLMO-20190201**					
Laboratory ID:	02-005-14					
Dissolved Organic Carbon	**3.7**	1.0	SM 5310B	2-12-19	2-12-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA63-20190201**					
Laboratory ID:	02-005-15					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	2-12-19	2-12-19	
Client ID:	**QA64-20190201**					
Laboratory ID:	02-005-16					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	2-12-19	2-12-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0212D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	2-12-19	2-12-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-005-01								
	ORIG	DUP							
Dissolved Organic Carbon	**12.2**	**12.4**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	02-005-01								
	MS		MS		MS				
Dissolved Organic Carbon	**22.4**		10.0	12.2	102	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0212D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.33**		10.0	NA	93	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190201**					
Laboratory ID:	02-005-01					
Total Phosphorus	**0.023**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**COUMI-20190201**					
Laboratory ID:	02-005-02					
Total Phosphorus	**0.23**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**COUMO-20190201**					
Laboratory ID:	02-005-03					
Total Phosphorus	**0.15**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**EVAMS-20190201**					
Laboratory ID:	02-005-04					
Total Phosphorus	**0.041**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**EVALSS-20190201**					
Laboratory ID:	02-005-05					
Total Phosphorus	**0.062**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**MONMN-20190201**					
Laboratory ID:	02-005-06					
Total Phosphorus	**0.073**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**MONMS-20190201**					
Laboratory ID:	02-005-07					
Total Phosphorus	**0.040**	0.010	EPA 365.1	2-12-19	2-13-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190201**					
Laboratory ID:	02-005-08					
Total Phosphorus	**0.087**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**SEIMN-20190201**					
Laboratory ID:	02-005-09					
Total Phosphorus	**0.062**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**SEIMS-20190201**					
Laboratory ID:	02-005-10					
Total Phosphorus	**0.11**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**TOSMI-20190201**					
Laboratory ID:	02-005-11					
Total Phosphorus	**0.25**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**TOSMO-20190201**					
Laboratory ID:	02-005-12					
Total Phosphorus	**0.28**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**TYLMI-20190201**					
Laboratory ID:	02-005-13					
Total Phosphorus	**0.064**	0.010	EPA 365.1	2-12-19	2-13-19	
Client ID:	**TYLMO-20190201**					
Laboratory ID:	02-005-14					
Total Phosphorus	**0.30**	0.010	EPA 365.1	2-12-19	2-13-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA64-20190201**					
Laboratory ID:	02-005-16					
Total Phosphorus	**0.041**	0.010	EPA 365.1	2-12-19	2-13-19	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0212W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	2-12-19	2-13-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-005-01								
	ORIG	DUP							
Total Phosphorus	**0.0229**	**0.0236**	NA	NA	NA	NA	3	12	
MATRIX SPIKE									
Laboratory ID:	02-005-01								
	MS		MS		MS				
Total Phosphorus	**0.279**		0.250	0.0229	102	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0212W1								
	SB		SB		SB				
Total Phosphorus	**0.262**		0.250	NA	105	83-114	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190201**					
Laboratory ID:	02-005-01					
Copper	**1.1**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**ND**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**COUMI-20190201**					
Laboratory ID:	02-005-02					
Copper	**7.2**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**59**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**COUMO-20190201**					
Laboratory ID:	02-005-03					
Copper	**8.0**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**82**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**EVAMS-20190201**					
Laboratory ID:	02-005-04					
Copper	**ND**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**ND**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**EVALSS-20190201**					
Laboratory ID:	02-005-05					
Copper	**1.1**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**ND**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**MONMN-20190201**					
Laboratory ID:	02-005-06					
Copper	**1.4**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**6.9**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**MONMS-20190201**					
Laboratory ID:	02-005-07					
Copper	**1.8**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**6.2**	5.0	EPA 200.8	2-8-19	2-11-19	

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Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190201**					
Laboratory ID:	02-005-08					
Copper	**2.1**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**22**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**SEIMN-20190201**					
Laboratory ID:	02-005-09					
Copper	**1.3**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**ND**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**SEIMS-20190201**					
Laboratory ID:	02-005-10					
Copper	**ND**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**ND**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**TOSMI-20190201**					
Laboratory ID:	02-005-11					
Copper	**16**	5.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**430**	25	EPA 200.8	2-8-19	2-11-19	
Client ID:	**TOSMO-20190201**					
Laboratory ID:	02-005-12					
Copper	**11**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**300**	13	EPA 200.8	2-8-19	2-11-19	
Client ID:	**TYLMI-20190201**					
Laboratory ID:	02-005-13					
Copper	**2.7**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**12**	5.0	EPA 200.8	2-8-19	2-11-19	
Client ID:	**TYLMO-20190201**					
Laboratory ID:	02-005-14					
Copper	**16**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**1700**	130	EPA 200.8	2-8-19	2-11-19	

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA64-20190201**					
Laboratory ID:	02-005-16					
Copper	**1.7**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**7.8**	5.0	EPA 200.8	2-8-19	2-11-19	

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0208WH2					
Copper	**ND**	1.0	EPA 200.8	2-8-19	2-11-19	
Zinc	**ND**	5.0	EPA 200.8	2-8-19	2-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-005-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	02-005-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**93.6**	**93.6**	100	100	ND	**94**	**94**	75-125	0	20	
Zinc	**103**	**100**	100	100	ND	**103**	**100**	75-125	3	20	

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190201**					
Laboratory ID:	02-005-01					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	
Client ID:	**COUMI-20190201**					
Laboratory ID:	02-005-02					
Copper	**2.3**	1.0	EPA 200.8		2-11-19	
Zinc	**7.6**	5.0	EPA 200.8		2-11-19	
Client ID:	**COUMO-20190201**					
Laboratory ID:	02-005-03					
Copper	**2.7**	1.0	EPA 200.8		2-11-19	
Zinc	**13**	5.0	EPA 200.8		2-11-19	
Client ID:	**EVAMS-20190201**					
Laboratory ID:	02-005-04					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	
Client ID:	**EVALSS-20190201**					
Laboratory ID:	02-005-05					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	
Client ID:	**MONMN-20190201**					
Laboratory ID:	02-005-06					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	
Client ID:	**MONMS-20190201**					
Laboratory ID:	02-005-07					
Copper	**1.4**	1.0	EPA 200.8		2-11-19	
Zinc	**5.3**	5.0	EPA 200.8		2-11-19	

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190201**					
Laboratory ID:	02-005-08					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**10**	5.0	EPA 200.8		2-11-19	
Client ID:	**SEIMN-20190201**					
Laboratory ID:	02-005-09					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	
Client ID:	**SEIMS-20190201**					
Laboratory ID:	02-005-10					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	
Client ID:	**TOSMI-20190201**					
Laboratory ID:	02-005-11					
Copper	**5.4**	1.0	EPA 200.8		2-11-19	
Zinc	**170**	5.0	EPA 200.8		2-11-19	
Client ID:	**TOSMO-20190201**					
Laboratory ID:	02-005-12					
Copper	**3.4**	1.0	EPA 200.8		2-11-19	
Zinc	**65**	5.0	EPA 200.8		2-11-19	
Client ID:	**TYLMI-20190201**					
Laboratory ID:	02-005-13					
Copper	**1.6**	1.0	EPA 200.8		2-11-19	
Zinc	**5.8**	5.0	EPA 200.8		2-11-19	
Client ID:	**TYLMO-20190201**					
Laboratory ID:	02-005-14					
Copper	**4.3**	1.0	EPA 200.8		2-11-19	
Zinc	**1000**	50	EPA 200.8		2-11-19	

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA63-20190201**					
Laboratory ID:	02-005-15					
Copper	**3.2**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	
Client ID:	**QA64-20190201**					
Laboratory ID:	02-005-16					
Copper	**1.4**	1.0	EPA 200.8		2-11-19	
Zinc	**5.4**	5.0	EPA 200.8		2-11-19	

Date of Report: February 19, 2019
Samples Submitted: February 1, 2019
Laboratory Reference: 1902-005
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0211D1					
Copper	**ND**	1.0	EPA 200.8		2-11-19	
Zinc	**ND**	5.0	EPA 200.8		2-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-005-15										
	ORIG	DUP									
Copper	**3.22**	**3.18**	NA	NA		NA		NA	1	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	02-005-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**71.6**	**70.4**	80.0	80.0	3.22	**86**	**84**	75-125	2	20	
Zinc	**76.4**	**77.6**	80.0	80.0	ND	**96**	**97**	75-125	2	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 19 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190201	Water	19-A1473	Micro, NUT
COUMI-20190201	Water	19-A1474	Micro, NUT
COUMO-20190201	Water	19-A1475	Micro, NUT
EVAMS-20190201	Water	19-A1476	Micro, NUT
EVALSS-20190201	Water	19-A1477	Micro, NUT
MONMN-20190201	Water	19-A1478	Micro, NUT
MONMS-20190201	Water	19-A1479	Micro, NUT
MONM-20190201	Water	19-A1480	Micro, NUT
SEIMN-20190201	Water	19-A1481	Micro, NUT
SEIMS-20190201	Water	19-A1482	Micro, NUT
TOSMI-20190201	Water	19-A1483	Micro, NUT
TOSMO-20190201	Water	19-A1484	Micro, NUT
TYLMI-20190201	Water	19-A1485	Micro, NUT
TYLMO-20190201	Water	19-A1486	Micro, NUT
QA64-20190201	Water	19-A1487	Micro, NUT

Your samples were received on Friday, February 1, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 19 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 02-005

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 02-005
All results reported on an as received basis.

Date Received: 02/01/19
Date Reported: 2/19/19

AMTEST Identification Number **19-A1473**
Client Identification **COLM-20190201**
Sampling Date **02/01/19, 10:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	0.51	mg/l		0.1			
Total Nitrogen (TKN)	0.451	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.057	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1474**
Client Identification **COUMI-20190201**
Sampling Date **02/01/19, 08:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	1.49	mg/l		0.1			
Total Nitrogen (TKN)	1.26	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.23	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1475**
Client Identification **COUMO-20190201**
Sampling Date **02/01/19, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	320	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	1.24	mg/l		0.1			
Total Nitrogen (TKN)	0.803	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.44	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1476**
Client Identification **EVAMS-20190201**
Sampling Date **02/01/19, 08:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	10.	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	2.47	mg/l		0.1			
Total Nitrogen (TKN)	0.569	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	1.9	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1477**
Client Identification **EVALSS-20190201**
Sampling Date **02/01/19, 08:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	20.	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	2.08	mg/l		0.1			
Total Nitrogen (TKN)	0.583	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	1.5	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1478**
Client Identification **MONMN-20190201**
Sampling Date **02/01/19, 09:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 5	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	0.71	mg/l		0.1			
Total Nitrogen (TKN)	0.444	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1479**
Client Identification **MONMS-20190201**
Sampling Date **02/01/19, 10:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	70.	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.408	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.33	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1480**
Client Identification **MONM-20190201**
Sampling Date **02/01/19, 10:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	45.	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	0.93	mg/l		0.1			
Total Nitrogen (TKN)	0.588	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.34	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1481**
Client Identification **SEIMN-20190201**
Sampling Date **02/01/19, 11:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	10.	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	0.66	mg/l		0.1			
Total Nitrogen (TKN)	0.517	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1482**
Client Identification **SEIMS-20190201**
Sampling Date **02/01/19, 09:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	60.	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	1.10	mg/l		0.1			
Total Nitrogen (TKN)	0.866	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.23	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1483**
Client Identification **TOSMI-20190201**
Sampling Date **02/01/19, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	440	CFU/100 ml		20	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	2.85	mg/l		0.1			
Total Nitrogen (TKN)	1.75	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1484**
Client Identification **TOSMO-20190201**
Sampling Date **02/01/19, 08:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	480	CFU/100 ml		20	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	2.68	mg/l		0.1			
Total Nitrogen (TKN)	1.69	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.99	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1485**
Client Identification **TYLMI-20190201**
Sampling Date **02/01/19, 09:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 5	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	1.24	mg/l		0.1			
Total Nitrogen (TKN)	0.470	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.77	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1486**
Client Identification **TYLMO-20190201**
Sampling Date **02/01/19, 08:45**

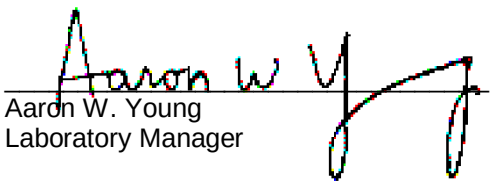
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	180	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	1.69	mg/l		0.1			
Total Nitrogen (TKN)	1.45	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	AG	02/08/19

AMTEST Identification Number **19-A1487**
Client Identification **QA64-20190201**
Sampling Date **02/01/19, 10:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	25.	CFU/100 ml		5	SM 9222D	JM	02/01/19
Total Nitrogen (NOX&TKN)	0.69	mg/l		0.1			
Total Nitrogen (TKN)	0.369	mg/l		0.2	SM4500N	MJ	02/13/19
Total Nitrate + Nitrite	0.32	mg/l		0.02	SM4500NO3	AG	02/08/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
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Professional Analytical Services

QC Summary for sample numbers: 19-A1473 to 19-A1487

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A1476	Fecal coliform	CFU/100 ml	10.	< 5	
19-A1477	Fecal coliform	CFU/100 ml	20.	35.	55.
19-A1473	Total Nitrogen (TKN)	mg/l	0.451	0.538	18.
19-A1483	Total Nitrogen (TKN)	mg/l	1.75	1.90	8.2
19-A1617	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
19-A1627	Total Nitrogen (TKN)	mg/l	2.37	2.03	15.
19-A1654	Total Nitrogen (TKN)	mg/l	27.1	26.7	1.5
19-A1475	Total Nitrate + Nitrite	mg/l	0.44	0.43	2.3
19-A1485	Total Nitrate + Nitrite	mg/l	0.77	0.76	1.3
19-A1590	Total Nitrate + Nitrite	mg/l	0.43	0.42	2.4
19-A1592	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
Duplicate	Total Nitrogen (TKN)	mg/l	0.538	2.50	2.00	98.10 %
Duplicate	Total Nitrogen (TKN)	mg/l	1.90	3.78	2.00	94.00 %
Duplicate	Total Nitrogen (TKN)	mg/l	< 0.2	1.91	2.00	95.50 %
Duplicate	Total Nitrogen (TKN)	mg/l	2.03	4.43	2.00	120.00 %
Duplicate	Total Nitrogen (TKN)	mg/l	26.7	47.6	20.0	104.50 %
19-A1475	Total Nitrate + Nitrite	mg/l	0.44	1.4	1.0	96.00 %
19-A1485	Total Nitrate + Nitrite	mg/l	0.77	1.7	1.0	93.00 %
19-A1590	Total Nitrate + Nitrite	mg/l	0.43	1.4	1.0	97.00 %
19-A1592	Total Nitrate + Nitrite	mg/l	< 0.02	1.0	1.0	100.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.09	109. %
Total Nitrogen (TKN)	mg/l	1.00	1.09	109. %
Total Nitrate + Nitrite	mg/l	1.0	0.95	95.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.95	95.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.95	95.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2

QC Summary for sample numbers: 19-A1473 to 19-A1487...

BLANKS continued....

ANALYTE	UNITS	RESULT
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

8.3

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 02-005

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20190201 1473	2/1/19	10:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20190201 74	2/1/19	8:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190201 75	2/1/19	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190201 76	2/1/19	8:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190201 77	2/1/19	8:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190201 78	2/1/19	9:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190201 79	2/1/19	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190201 80	2/1/19	10:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190201 81	2/1/19	11:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190201 82	2/1/19	9:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSHC	2/1/19	1350	
Received by: Sandra Hutchison	Amtest	2/1/19	1150	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

8.3

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 02-005

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190201 1483	2/1/19	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190201 84	2/1/19	8:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190201 85	2/1/19	9:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20190201 86	2/1/19	8:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
16	QA64-20190201 87	2/1/19	10:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite	2/1/19	1350	EDDs - CSV
Received by: Sandra Hutchison	Amtest	2/1/19	1:50	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 02-005

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0201	10:30	2.1.19	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0201	8:00		Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0201	7:30		Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0201	8:10		Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0201	8:40		Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0201	9:50		Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0201	10:20		Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0201	10:50		Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0201	11:00		Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0201	9:30		Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0201	7:30		Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0201	8:20		Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0201	9:15		Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0201	8:45		Water	7	X	X	X	X	X	X	X	X	X			
15	QA 63-2019 0201	9:00		Water	~~7~~ 2	~~X~~	~~X~~	~~X~~	X	~~X~~	~~X~~	~~X~~	~~X~~	X			
16	QA64-2019021	10:30		Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Mullen Date 02.01.19 Received by Katie Lizee Date 2-1-19
Firm Herrera Time 12:00 Firm OSE Time 12:00
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 02-005

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0201	10:30	2.1.19	Water	7	x	x	x	x	x	x	x	x	x			
2	COUMI-2019 0201	8:00		Water	7	x	x	x	x	x	x	x	x	x			
3	COUMO-2019 0201	7:30		Water	7	x	x	x	x	x	x	x	x	x			
4	EVAMS-2019 0201	8:10		Water	7	x	x	x	x	x	x	x	x	x			
5	EVALSS-2019 0201	8:40		Water	7	x	x	x	x	x	x	x	x	x			
6	MONMN-2019 0201	9:50		Water	7	x	x	x	x	x	x	x	x	x			
7	MONMS-2019 0201	10:20		Water	7	x	x	x	x	x	x	x	x	x			
8	MONM-2019 0201	10:50		Water	7	x	x	x	x	x	x	x	x	x			
9	SEIMN-2019 0201	11:00		Water	7	x	x	x	x	x	x	x	x	x			
10	SEIMS-2019 0201	9:20		Water	7	x	x	x	x	x	x	x	x	x			
11	TOSMI-2019 0201	7:30		Water	7	x	x	x	x	x	x	x	x	x			
12	TOSMO-2019 0201	8:20		Water	7	x	x	x	x	x	x	x	x	x			
13	TYLMI-2019 0201	9:15		Water	7	x	x	x	x	x	x	x	x	x			
14	TYLMO-2019 0201	8:45		Water	7	x	x	x	x	x	x	x	x	x			
15	QA 63-2019 0201	9:00		Water	~~7~~ 2	~~x~~	~~x~~	~~x~~	x	~~x~~	~~x~~	~~x~~	~~x~~	x			
16	QA64-2019 0201	10:30		Water	7	x	x	x	x	x	x	x	x	x			

Relinquished by Meghan Mullen Date 02.01.19 Received by Katie Lizell Date 2-1-19
Firm Herrera Time 12:05 Firm OSE Time 12:00
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Meghan Mullen
Meter:	YSI Pro DSS #1
Date/Time:	01.31.19 / 16:00
Barometric Pressure Start of Day:	mmHg: — Time: —
Barometric Pressure End of Day:	mmHg: 754.4 Time: 12:40 2.1.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.5	0	23.2	Herrera DI water
Conductivity (µS/cm)	1036	1,000	22.9	calibrated: new = 1000
Conductivity (µS/cm)	100.9	100	23.0	
DO % Saturation	98.8	100	22.4	calibrated new = 99.9

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.1	0	21.9	Herrera DI water
Conductivity (µS/cm)	100.2	100	22.6	
DO % Saturation	100.4	100	21.9	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Meghan Mullen
Meter:	YSI Pro DSS #2
Date/Time:	01.31.19 / 16:00
Barometric Pressure Start of Day:	mmHg: — Time: —
Barometric Pressure End of Day:	mmHg: 754.6 Time: 1640 / 2.1.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.0	0	24.1	Herrera DI water
Conductivity (µS/cm)	1005	1,000	23.2	
Conductivity (µS/cm)	102.5	100	23.3	
DO % Saturation	100.3	100	22.8	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm) 2.0	[illegible]	0	21.7	Herrera DI water
Conductivity (µS/cm) 99.9	[illegible]	100	23.2	
DO % Saturation	99.5	100	22.2	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Fifield

Sample Date: 2/1/19 **Sample Time:** 10:30 PDT ✓ PST

Base Flow or Storm Event? Storm **Field Filtered Time:** 10:40

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Lt. rain 45°

Water Quality Sampling

Sample ID: GOLM20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: ~~Colorless~~ Very lt. brown

Odor: odorless

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sara Leuthold **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.60

Reference Point (description): staff gage

Water Quality Measurments

Temperature (°C) 5.3

Specific Conductivity (µs/cm) 33.9

Dissolved Oxygen (mg/L) 11.63

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M M

Sample Date: 2.01.19 **Sample Time:** 800 PDT: PST: X

Base Flow or Storm Event? (0)

Field Filtered Time: 805
(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43

HERRERA

Water Quality Sampling

Sample ID: COUM1-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: -
Filter blank sample ID: -
Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: some turbidity
Color: light brown
Odor: -
Sheen: -
Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lott **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.68

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.4

Specific Conductivity (µs/cm) 188.6

Dissolved Oxygen (mg/L) 11.78

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 2.1.19 **Sample Time:** 7:30 PDT

Base Flow or Storm Event? 0 **Field Filtered Time:** 7:35 PST X

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43

HERRERA

Water Quality Sampling

Sample ID: COUMO-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: -

Filter blank sample ID: -

Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: -

Sheen: -

Floatables: -

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Shannon Leuth **Signature:**

Date Checked: 2-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.40

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.4

Specific Conductivity (µs/cm) 147.7

Dissolved Oxygen (mg/L) 11.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Effner, T. Prescott

Sample Date: 2/1/19 **Sample Time:** ~~2/1/19~~ 8:10 PDT ✓ PST

Base Flow or Storm Event? Storm **Field Filtered Time:** 8:20
(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Lt. rain 43°F

Water Quality Sampling

Sample ID: EVAMS20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: Colorless

Odor: odorless

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Z. Lun Lantz **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.8

Reference Point (description): staff gage

Water Quality Measurments

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 194

Dissolved Oxygen (mg/L) 11.79

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, T. Prescott

Sample Date: 2/1/19 Sample Time: 8:40 PDT: ✓ PST:

Base Flow or Storm Event? Storm Field Filtered Time: 8:50

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: LT. Rain 43°

Water Quality Sampling

Sample ID: EVALSS20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: ~~ND~~ CLEAR

Odor: None

Sheen: NONE

Floatables: NONE

LABORATORY DELIVERY

Date: Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.36

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.9

Specific Conductivity (µs/cm) 176.2

Dissolved Oxygen (mg/L) 99.8 → incorrect (% rather than mg/L)

QAG3 - Filter Blank.

09:00

Quality Assurance

Checked By: John Lott Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 02.01.19 **Sample Time:** 9:50 PDT

Base Flow or Storm Event? **Field Filtered Time:** 9:55 PST X

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43

Water Quality Sampling

Sample ID: MONMN-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NC
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lentz **Signature:**

Date Checked: 2-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.22

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.8

Specific Conductivity (µs/cm) 25.7

Dissolved Oxygen (mg/L) 11.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + TP

Sample Date: 2.1.19 **Sample Time:** 10:20 | 10:30 PDT:

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 10:25 | 10:35 PST: X

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43

Water Quality Sampling

Sample ID: MONMS-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: GA64-20190201

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.64

Reference Point (description): top of pvc down

Water Quality Measurments

Temperature (°C) 7.2

Specific Conductivity (µs/cm) 276.4

Dissolved Oxygen (mg/L) 10.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + TP

Sample Date: 2.1.19 **Sample Time:** 10:50 PDT

Base Flow or Storm Event? (circle) **Field Filtered Time:** 10:55 PST X

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43

Water Quality Sampling

Sample ID: MONM-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: some turbidity

Color: brown

Odor: none

Sheen: none

Floatables: some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): –

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 7.3

Specific Conductivity (µs/cm) 192.3

Dissolved Oxygen (mg/L) 11.91

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Ifter

Sample Date: 2/1/19 **Sample Time:** 11:00 PDT ✓ PST

Base Flow or Storm Event? Storm **Field Filtered Time:** 11:10
(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Lt. Rain 45°

Water Quality Sampling

Sample ID: SEIMN20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	X
DOC *	HDPE	250 ml	1	HCL	X
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	X
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	X
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	X
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	X
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: X

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: Very lt. brown

Odor: None

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Smith **Signature:**

Date Checked: **Time:**

Data Entered into Database? YES ✓ NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.59'

Reference Point (description): ~~Top~~ of bolt on pipe

Water Quality Measurments

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 62

Dissolved Oxygen (mg/L) 12.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, T. Prescott

Sample Date: 2/1/19 **Sample Time:** 9:30 PDT: ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 9:40 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Lt. Rain, 43° F

Water Quality Sampling

Sample ID: SEIMS20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	
Color:	
Odor:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Shan Lenth **Signature:**

Date Checked: 3-25-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 ✓
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.80

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.1

Specific Conductivity (µs/cm) 103

Dissolved Oxygen (mg/L) 11.32

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: C. Ettner, T. Prescott

Sample Date: 2/1/19 Sample Time: 07:30 PDT ✓ PST

Base Flow or Storm Event? Storm Field Filtered Time: 7:40

(Must filter within 15 minutes of collection)

SITE ID: TOSM I

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Lt. rain 43° F

Water Quality Sampling

Sample ID: TOSMI20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID

Color: COLORLESS

Odor: ODORLESS

Sheen: NO

Floatables: NO

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Silvia Lentl Signature:

Date Checked: 3-28-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.90

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.9 c

Specific Conductivity (µs/cm) 159

Dissolved Oxygen (mg/L) 11.8

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 2.01.19 **Sample Time:** 820 PDT

Base Flow or Storm Event? B) **Field Filtered Time:** 825 PST X

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43

Water Quality Sampling

Sample ID: TOSMO-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: -

Filter blank sample ID: -

Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: -

Sheen: -

Floatables: foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sohn Lantz **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.89

Reference Point (description): SR

Water Quality Measurments

Temperature (°C) 7.9

Specific Conductivity (µs/cm) 204.6

Dissolved Oxygen (mg/L) 11.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 2.1.19 **Sample Time:** 9:15 PDT: PST: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 9:20

(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43

Water Quality Sampling

Sample ID: TYLM1-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NC
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: None; red residue @ culvert mouth

Odor:

Sheen: -

Floatables: some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 3-7&19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.5

Reference Point (description): top of arch down

Water Quality Measurments

Temperature (°C) 7.3

Specific Conductivity (µs/cm) 191.2

Dissolved Oxygen (mg/L) 11.14

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM

Sample Date: 2.1.19 **Sample Time:** 845 PDT: **Field Filtered Time:** 850 PST: X

Base Flow or Storm Event? (Must filter within 15 minutes of collection)

SITE ID: TYLM0

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 43

Water Quality Sampling

Sample ID: TYLM0-20190201

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: =

Filter blank sample ID: =

Transfer blank sample ID: =

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: =

Sheen: =

Floatables: some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Shannon Loomis **Signature:**

Date Checked: 3-28-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.65

Reference Point (description): top of arch down

Water Quality Measurments

Temperature (°C) 7.0

Specific Conductivity (µs/cm) 97.5

Dissolved Oxygen (mg/L) 11.80

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/6/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 2/01/2019 / All locations, QA64 (MONMS) FB (QA63) Lab Ref No 1902-005

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	5	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	86	**±20**	2	**≤ 25**	D=0.8	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	6	**≤ 25**	16	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	7	**≤180**	≤1.0 mg/L 1.0 mg/L	96,98	**±25**	105	**±15**	1,4	**≤ 20**	0	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	11	**≤28**	≤1.0 mg/L 1.0 mg/L	102	**±25**	93	**±15**	2	**≤ 20**	2.2	**≤ 20**	OK	FB=ND NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	12	**≤28**	≤0.01 mg/L 0.01 mg/L	102	**±25**	105	**±20**	3	**≤ 20**	2.5	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	7-12	**≤28**	≤0.1 mg/L 0.1 mg/L	96	**±25**	94-109	**±20**	1.3-18	**≤ 20**	D= 0.063 5.7	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/6/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 2/01/2019 / All locations, QA64 (MONMS) FB (QA63) Lab Ref No 1902-005

date 3/28/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	10	**≤180**	≤1.0 µg/L 1.0 µg/L	94,94	**±25**	NR	**±15**	NC, 0	**≤ 20**	D=0.1	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	10	**≤180**	≤5.0 µg/L 5.0 µg/L	103,100	**±25**	NR	**±15**	NC, 3	**≤ 20**	D-1.6	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	10	**≤180**	≤1.0 µg/L 1.0 µg/L	86,84	**±25**	NR	**±15**	1,2	**≤ 20**	0	**≤ 20**	OK	FB=3.2 FLAG J (LISTED BELOW)
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	10	**≤180**	≤5.0 µg/L 5.0 µg/L	96,97	**±25**	NR	**±15**	NC,2	**≤ 20**	D=0.1	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	<1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	NC D=15	**≤ 35**	D=50	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Flag J due to FB result: COUMI, COUMO, MONMS, TOSMI, TOSMO, TYLMI, TYLMO (all other samples ND)

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

March 22, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1903-106

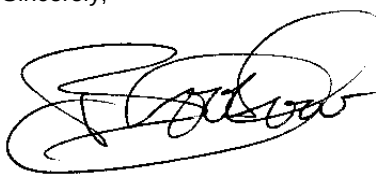
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on March 12, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

Case Narrative

Samples were collected on March 11 and 12, 2019 and received by the laboratory on March 12, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUM-20190311**					
Laboratory ID:	03-106-01					
Total Suspended Solids	**4.0**	1.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**COUMI-20190311**					
Laboratory ID:	03-106-02					
Total Suspended Solids	**140**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**COUMO-20190311**					
Laboratory ID:	03-106-03					
Total Suspended Solids	**85**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**EVAMS-20190311**					
Laboratory ID:	03-106-04					
Total Suspended Solids	**19**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**EVALSS-20190311**					
Laboratory ID:	03-106-05					
Total Suspended Solids	**39**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**MONMN-20190311**					
Laboratory ID:	03-106-06					
Total Suspended Solids	**26**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**MONMS-20190312**					
Laboratory ID:	03-106-07					
Total Suspended Solids	**4.4**	1.0	SM 2540D	3-14-19	3-15-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190312**					
Laboratory ID:	03-106-08					
Total Suspended Solids	**36**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**SEIMN-20190312**					
Laboratory ID:	03-106-09					
Total Suspended Solids	**70**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**SEIMS-20190312**					
Laboratory ID:	03-106-10					
Total Suspended Solids	**28**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**TOSMI-20190311**					
Laboratory ID:	03-106-11					
Total Suspended Solids	**94**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**TOSMO-20190311**					
Laboratory ID:	03-106-12					
Total Suspended Solids	**100**	2.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**TYLMI-20190311**					
Laboratory ID:	03-106-13					
Total Suspended Solids	**12**	1.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**TYLMO-20190311**					
Laboratory ID:	03-106-14					
Total Suspended Solids	**44**	2.0	SM 2540D	3-14-19	3-15-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6520190311**					
Laboratory ID:	03-106-15					
Total Suspended Solids	**ND**	1.0	SM 2540D	3-14-19	3-15-19	
Client ID:	**QA6620190311**					
Laboratory ID:	03-106-16					
Total Suspended Solids	**86**	2.0	SM 2540D	3-14-19	3-15-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0314W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	3-14-19	3-15-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	03-106-02								
	ORIG	DUP							
Total Suspended Solids	**142**	**148**	NA	NA	NA	NA	4	22	
SPIKE BLANK									
Laboratory ID:	SB0314W1								
	SB		SB		SB				
Total Suspended Solids	**91.0**		100	NA	91	79-116	NA	NA	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUM-20190311**					
Laboratory ID:	03-106-01					
Turbidity	**1.3**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**COUMI-20190311**					
Laboratory ID:	03-106-02					
Turbidity	**62**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**COUMO-20190311**					
Laboratory ID:	03-106-03					
Turbidity	**48**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**EVAMS-20190311**					
Laboratory ID:	03-106-04					
Turbidity	**12**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**EVALSS-20190311**					
Laboratory ID:	03-106-05					
Turbidity	**19**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**MONMN-20190311**					
Laboratory ID:	03-106-06					
Turbidity	**17**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**MONMS-20190312**					
Laboratory ID:	03-106-07					
Turbidity	**3.8**	0.10	EPA 180.1	3-12-19	3-12-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190312**					
Laboratory ID:	03-106-08					
Turbidity	**18**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**SEIMN-20190312**					
Laboratory ID:	03-106-09					
Turbidity	**25**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**SEIMS-20190312**					
Laboratory ID:	03-106-10					
Turbidity	**11**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**TOSMI-20190311**					
Laboratory ID:	03-106-11					
Turbidity	**37**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**TOSMO-20190311**					
Laboratory ID:	03-106-12					
Turbidity	**51**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**TYLMI-20190311**					
Laboratory ID:	03-106-13					
Turbidity	**9.9**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**TYLMO-20190311**					
Laboratory ID:	03-106-14					
Turbidity	**29**	0.10	EPA 180.1	3-12-19	3-12-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6520190311**					
Laboratory ID:	03-106-15					
Turbidity	**ND**	0.10	EPA 180.1	3-12-19	3-12-19	
Client ID:	**QA6620190311**					
Laboratory ID:	03-106-16					
Turbidity	**46**	0.10	EPA 180.1	3-12-19	3-12-19	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0312W1					
Turbidity	**ND**	0.10	EPA 180.1	3-12-19	3-12-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	03-101-01								
	ORIG	DUP							
Turbidity	**16.0**	**16.4**	NA	NA	NA	NA	2	15	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUM-20190311**					
Laboratory ID:	03-106-01					
Hardness	**11**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**COUMI-20190311**					
Laboratory ID:	03-106-02					
Hardness	**86**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**COUMO-20190311**					
Laboratory ID:	03-106-03					
Hardness	**67**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**EVAMS-20190311**					
Laboratory ID:	03-106-04					
Hardness	**86**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**EVALSS-20190311**					
Laboratory ID:	03-106-05					
Hardness	**82**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**MONMN-20190311**					
Laboratory ID:	03-106-06					
Hardness	**70**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**MONMS-20190312**					
Laboratory ID:	03-106-07					
Hardness	**99**	1.0	200.7/SM 2340B	3-19-19	3-19-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190312**					
Laboratory ID:	03-106-08					
Hardness	**74**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**SEIMN-20190312**					
Laboratory ID:	03-106-09					
Hardness	**24**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**SEIMS-20190312**					
Laboratory ID:	03-106-10					
Hardness	**39**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**TOSMI-20190311**					
Laboratory ID:	03-106-11					
Hardness	**78**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**TOSMO-20190311**					
Laboratory ID:	03-106-12					
Hardness	**93**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**TYLMI-20190311**					
Laboratory ID:	03-106-13					
Hardness	**77**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**TYLMO-20190311**					
Laboratory ID:	03-106-14					
Hardness	**27**	1.0	200.7/SM 2340B	3-19-19	3-19-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6520190311**					
Laboratory ID:	03-106-15					
Hardness	**ND**	1.0	200.7/SM 2340B	3-19-19	3-19-19	
Client ID:	**QA6620190311**					
Laboratory ID:	03-106-16					
Hardness	**66**	1.0	200.7/SM 2340B	3-19-19	3-19-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0319WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	3-19-19	3-19-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	03-106-01										
	ORIG	DUP									
Hardness	**11.4**	**11.3**	NA		NA	NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	03-106-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**154**	**155**	132	132	11.4	108	109	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0319WH1										
	SB		SB			SB					
Hardness	**139**		132		NA	105		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUM-20190311**					
Laboratory ID:	03-106-01					
Dissolved Organic Carbon	**8.0**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**COUMI-20190311**					
Laboratory ID:	03-106-02					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**COUMO-20190311**					
Laboratory ID:	03-106-03					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**EVAMS-20190311**					
Laboratory ID:	03-106-04					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**EVALSS-20190311**					
Laboratory ID:	03-106-05					
Dissolved Organic Carbon	**3.7**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**MONMN-20190311**					
Laboratory ID:	03-106-06					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**MONMS-20190312**					
Laboratory ID:	03-106-07					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	3-19-19	3-19-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190312**					
Laboratory ID:	03-106-08					
Dissolved Organic Carbon	**5.2**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**SEIMN-20190312**					
Laboratory ID:	03-106-09					
Dissolved Organic Carbon	**7.0**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**SEIMS-20190312**					
Laboratory ID:	03-106-10					
Dissolved Organic Carbon	**5.4**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**TOSMI-20190311**					
Laboratory ID:	03-106-11					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**TOSMO-20190311**					
Laboratory ID:	03-106-12					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**TYLMI-20190311**					
Laboratory ID:	03-106-13					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**TYLMO-20190311**					
Laboratory ID:	03-106-14					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	3-19-19	3-19-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6520190311**					
Laboratory ID:	03-106-15					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	3-19-19	3-19-19	
Client ID:	**QA6620190311**					
Laboratory ID:	03-106-16					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	3-19-19	3-19-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0319W1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	3-19-19	3-19-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	03-106-01								
	ORIG	DUP							
Dissolved Organic Carbon	**7.98**	**8.15**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	03-106-01								
	MS		MS		MS				
Dissolved Organic Carbon	**19.1**		10.0	7.98	111	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0319W1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.84**		10.0	NA	98	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUM-20190311**					
Laboratory ID:	03-106-01					
Total Phosphorus	**0.011**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**COUMI-20190311**					
Laboratory ID:	03-106-02					
Total Phosphorus	**0.23**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**COUMO-20190311**					
Laboratory ID:	03-106-03					
Total Phosphorus	**0.17**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**EVAMS-20190311**					
Laboratory ID:	03-106-04					
Total Phosphorus	**0.047**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**EVALSS-20190311**					
Laboratory ID:	03-106-05					
Total Phosphorus	**0.069**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**MONMN-20190311**					
Laboratory ID:	03-106-06					
Total Phosphorus	**0.086**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**MONMS-20190312**					
Laboratory ID:	03-106-07					
Total Phosphorus	**0.035**	0.010	EPA 365.1	3-14-19	3-15-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190312**					
Laboratory ID:	03-106-08					
Total Phosphorus	**0.096**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**SEIMN-20190312**					
Laboratory ID:	03-106-09					
Total Phosphorus	**0.10**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**SEIMS-20190312**					
Laboratory ID:	03-106-10					
Total Phosphorus	**0.074**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**TOSMI-20190311**					
Laboratory ID:	03-106-11					
Total Phosphorus	**0.16**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**TOSMO-20190311**					
Laboratory ID:	03-106-12					
Total Phosphorus	**0.18**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**TYLMI-20190311**					
Laboratory ID:	03-106-13					
Total Phosphorus	**0.048**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**TYLMO-20190311**					
Laboratory ID:	03-106-14					
Total Phosphorus	**0.10**	0.010	EPA 365.1	3-14-19	3-15-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6520190311**					
Laboratory ID:	03-106-15					
Total Phosphorus	**ND**	0.010	EPA 365.1	3-14-19	3-15-19	
Client ID:	**QA6620190311**					
Laboratory ID:	03-106-16					
Total Phosphorus	**0.19**	0.010	EPA 365.1	3-14-19	3-15-19	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0314W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	3-14-19	3-15-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	03-103-01								
	ORIG	DUP							
Total Phosphorus	**0.0613**	**0.0644**	NA	NA	NA	NA	5	12	
MATRIX SPIKE									
Laboratory ID:	03-103-01								
	MS		MS		MS				
Total Phosphorus	**0.293**		0.250	0.0613	93	83-114	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0314W1								
	SB		SB		SB				
Total Phosphorus	**0.234**		0.250	NA	94	83-114	NA	NA	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUM-20190311**					
Laboratory ID:	03-106-01					
Copper	**ND**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**ND**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**COUMI-20190311**					
Laboratory ID:	03-106-02					
Copper	**9.6**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**70**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**COUMO-20190311**					
Laboratory ID:	03-106-03					
Copper	**7.4**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**53**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**EVAMS-20190311**					
Laboratory ID:	03-106-04					
Copper	**ND**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**ND**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**EVALSS-20190311**					
Laboratory ID:	03-106-05					
Copper	**1.6**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**ND**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**MONMN-20190311**					
Laboratory ID:	03-106-06					
Copper	**1.9**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**10**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**MONMS-20190312**					
Laboratory ID:	03-106-07					
Copper	**2.5**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**6.3**	5.0	EPA 200.8	3-15-19	3-15-19	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190312**					
Laboratory ID:	03-106-08					
Copper	**2.5**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**21**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**SEIMN-20190312**					
Laboratory ID:	03-106-09					
Copper	**2.6**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**ND**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**SEIMS-20190312**					
Laboratory ID:	03-106-10					
Copper	**ND**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**ND**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**TOSMI-20190311**					
Laboratory ID:	03-106-11					
Copper	**13**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**210**	10	EPA 200.8	3-15-19	3-15-19	
Client ID:	**TOSMO-20190311**					
Laboratory ID:	03-106-12					
Copper	**11**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**140**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**TYLMI-20190311**					
Laboratory ID:	03-106-13					
Copper	**5.2**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**45**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**TYLMO-20190311**					
Laboratory ID:	03-106-14					
Copper	**7.1**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**34**	5.0	EPA 200.8	3-15-19	3-15-19	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6520190311**					
Laboratory ID:	03-106-15					
Copper	**ND**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**ND**	5.0	EPA 200.8	3-15-19	3-15-19	
Client ID:	**QA6620190311**					
Laboratory ID:	03-106-16					
Copper	**8.5**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**64**	5.0	EPA 200.8	3-15-19	3-15-19	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0315WH1					
Copper	**ND**	1.0	EPA 200.8	3-15-19	3-15-19	
Zinc	**ND**	5.0	EPA 200.8	3-15-19	3-15-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	03-106-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	03-106-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**51.0**	**50.2**	50.0	50.0	ND	**102**	**100**	75-125	2	20	
Zinc	**61.2**	**60.0**	50.0	50.0	ND	**122**	**120**	75-125	2	20	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COUM-20190311**					
Laboratory ID:	03-106-01					
Copper	**ND**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	
Client ID:	**COUMI-20190311**					
Laboratory ID:	03-106-02					
Copper	**2.1**	1.0	EPA 200.8		3-18-19	
Zinc	**6.8**	5.0	EPA 200.8		3-18-19	
Client ID:	**COUMO-20190311**					
Laboratory ID:	03-106-03					
Copper	**3.2**	1.0	EPA 200.8		3-18-19	
Zinc	**14**	5.0	EPA 200.8		3-18-19	
Client ID:	**EVAMS-20190311**					
Laboratory ID:	03-106-04					
Copper	**ND**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	
Client ID:	**EVALSS-20190311**					
Laboratory ID:	03-106-05					
Copper	**ND**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	
Client ID:	**MONMN-20190311**					
Laboratory ID:	03-106-06					
Copper	**1.0**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	
Client ID:	**MONMS-20190312**					
Laboratory ID:	03-106-07					
Copper	**2.4**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190312**					
Laboratory ID:	03-106-08					
Copper	**1.2**	1.0	EPA 200.8		3-18-19	
Zinc	**7.7**	5.0	EPA 200.8		3-18-19	
Client ID:	**SEIMN-20190312**					
Laboratory ID:	03-106-09					
Copper	**ND**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	
Client ID:	**SEIMS-20190312**					
Laboratory ID:	03-106-10					
Copper	**ND**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	
Client ID:	**TOSMI-20190311**					
Laboratory ID:	03-106-11					
Copper	**6.7**	1.0	EPA 200.8		3-18-19	
Zinc	**96**	5.0	EPA 200.8		3-18-19	
Client ID:	**TOSMO-20190311**					
Laboratory ID:	03-106-12					
Copper	**5.0**	1.0	EPA 200.8		3-18-19	
Zinc	**43**	5.0	EPA 200.8		3-18-19	
Client ID:	**TYLMI-20190311**					
Laboratory ID:	03-106-13					
Copper	**4.0**	1.0	EPA 200.8		3-18-19	
Zinc	**30**	5.0	EPA 200.8		3-18-19	
Client ID:	**TYLMO-20190311**					
Laboratory ID:	03-106-14					
Copper	**3.9**	1.0	EPA 200.8		3-18-19	
Zinc	**9.4**	5.0	EPA 200.8		3-18-19	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA6520190311**					
Laboratory ID:	03-106-15					
Copper	**3.2**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	
Client ID:	**QA6620190311**					
Laboratory ID:	03-106-16					
Copper	**3.3**	1.0	EPA 200.8		3-18-19	
Zinc	**15**	5.0	EPA 200.8		3-18-19	

Date of Report: March 22, 2019
Samples Submitted: March 12, 2019
Laboratory Reference: 1903-106
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0318D1					
Copper	**ND**	1.0	EPA 200.8		3-18-19	
Zinc	**ND**	5.0	EPA 200.8		3-18-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	03-106-01										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	03-106-01										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**73.2**	**75.6**	80.0	80.0	ND	**92**	**95**	75-125	3	20	
Zinc	**78.2**	**79.2**	80.0	80.0	ND	**98**	**99**	75-125	1	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Mar 21 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COUM-20190311	Water	19-A003247	Micro, NUT
COUMI-20190311	Water	19-A003248	Micro, NUT
COUMO-20190311	Water	19-A003249	Micro, NUT
EVAMS-20190311	Water	19-A003250	Micro, NUT
EVALSS-20190311	Water	19-A003251	Micro, NUT
MONMN-20190311	Water	19-A003252	Micro, NUT
MONMS-20190311	Water	19-A003253	Micro, NUT
MONM-20190311	Water	19-A003254	Micro, NUT
SEIMN-20190311	Water	19-A003255	Micro, NUT
SEIMS-20190311	Water	19-A003256	Micro, NUT
TOSMI-20190311	Water	19-A003257	Micro, NUT
TOSMO-20190311	Water	19-A003258	Micro, NUT
TYLMI-20190311	Water	19-A003259	Micro, NUT
TYLMO-20190311	Water	19-A003260	Micro, NUT
QA6520190311	Water	19-A003261	Micro, NUT
QA6620190311	Water	19-A003262	Micro, NUT

Your samples were received on Tuesday, March 12, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

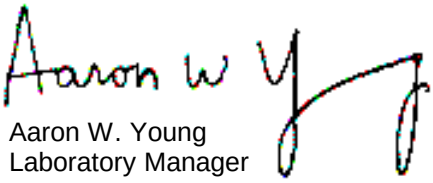
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Mar 21 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 03-106

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 03-106
All results reported on an as received basis.

Date Received: 03/12/19
Date Reported: 3/21/19

AMTEST Identification Number **19-A003247**
Client Identification **COUM-20190311**
Sampling Date **03/11/19, 23:59**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	24.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	0.46	mg/l		0.1			
Total Nitrogen (TKN)	0.384	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.072	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003248**
Client Identification **COUMI-20190311**
Sampling Date **03/11/19, 22:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	1.35	mg/l		0.1			
Total Nitrogen (TKN)	1.09	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003249**
Client Identification **COUMO-20190311**
Sampling Date **03/11/19, 11:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	1.36	mg/l		0.1			
Total Nitrogen (TKN)	1.00	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003250**
Client Identification **EVAMS-20190311**
Sampling Date **03/11/19, 22:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	16.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	2.38	mg/l		0.1			
Total Nitrogen (TKN)	0.676	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	1.7	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003251**
Client Identification **EVALSS-20190311**
Sampling Date **03/11/19, 23:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	300	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	2.18	mg/l		0.1			
Total Nitrogen (TKN)	0.784	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	1.4	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003252**
Client Identification **MONMN-20190311**
Sampling Date **03/11/19, 23:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	30.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.614	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.19	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003253**
Client Identification **MONMS-20190311**
Sampling Date **03/11/19, 00:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	14.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	0.82	mg/l		0.1			
Total Nitrogen (TKN)	0.491	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.33	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003254**
Client Identification **MONM-20190311**
Sampling Date **03/11/19, 01:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	48.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	0.97	mg/l		0.1			
Total Nitrogen (TKN)	0.712	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003255**
Client Identification **SEIMN-20190311**
Sampling Date **03/11/19, 00:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	64.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	0.71	mg/l		0.1			
Total Nitrogen (TKN)	0.558	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003256**
Client Identification **SEIMS-20190311**
Sampling Date **03/11/19, 01:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	18.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	0.83	mg/l		0.1			
Total Nitrogen (TKN)	0.592	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003257**
Client Identification **TOSMI-20190311**
Sampling Date **03/11/19, 22:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	480	CFU/100 ml		20	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	1.78	mg/l		0.1			
Total Nitrogen (TKN)	1.27	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.51	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003258**
Client Identification **TOSMO-20190311**
Sampling Date **03/11/19, 23:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	280	CFU/100 ml		20	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	1.85	mg/l		0.1			
Total Nitrogen (TKN)	1.28	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.57	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003259**
Client Identification **TYLMI-20190311**
Sampling Date **03/11/19, 23:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	10.	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	1.02	mg/l		0.1			
Total Nitrogen (TKN)	0.524	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.50	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003260**
Client Identification **TYLMO-20190311**
Sampling Date **03/11/19, 23:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	300	CFU/100 ml		20	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	0.94	mg/l		0.1			
Total Nitrogen (TKN)	0.687	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.25	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003261**
Client Identification **QA6520190311**
Sampling Date **03/11/19, 22:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	< 0.1	mg/l		0.1			
Total Nitrogen (TKN)	< 0.2	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	AG	03/14/19

AMTEST Identification Number **19-A003262**
Client Identification **QA6620190311**
Sampling Date **03/11/19, 22:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	380	CFU/100 ml		20	SM 9222D	JM	03/12/19
Total Nitrogen (NOX&TKN)	1.34	mg/l		0.1			
Total Nitrogen (TKN)	0.980	mg/l		0.2	SM4500N	AG	03/19/19
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	AG	03/14/19

Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 19-A003247 to 19-A003262

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A003247	Fecal coliform	CFU/100 ml	24.	50.	70.
19-A003261	Fecal coliform	CFU/100 ml	< 2	< 2	
19-A002921	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
19-A003248	Total Nitrogen (TKN)	mg/l	1.09	1.12	2.7
19-A003258	Total Nitrogen (TKN)	mg/l	1.28	1.16	9.8
19-A003270	Total Nitrogen (TKN)	mg/l	0.873	0.804	8.2
19-A002979	Total Nitrate + Nitrite	mg/l	0.35	0.33	5.9
19-A002989	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
19-A003255	Total Nitrate + Nitrite	mg/l	0.15	0.16	6.5
19-A003267	Total Nitrate + Nitrite	mg/l	1.2	1.2	0.00
19-A003277	Total Nitrate + Nitrite	mg/l	0.94	0.96	2.1
19-A003286	Total Nitrate + Nitrite	mg/l	0.036	0.028	25.

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A002921	Total Nitrogen (TKN)	mg/l	< 0.2	1.22	1.00	122.00 %
19-A003248	Total Nitrogen (TKN)	mg/l	1.09	2.24	1.00	115.00 %
19-A003258	Total Nitrogen (TKN)	mg/l	1.28	2.21	1.00	93.00 %
19-A003270	Total Nitrogen (TKN)	mg/l	0.873	1.95	1.00	107.70 %
19-A002979	Total Nitrate + Nitrite	mg/l	0.35	1.4	1.0	105.00 %
19-A002989	Total Nitrate + Nitrite	mg/l	< 0.02	1.0	1.0	100.00 %
19-A003255	Total Nitrate + Nitrite	mg/l	0.15	1.2	1.0	105.00 %
19-A003267	Total Nitrate + Nitrite	mg/l	1.2	2.2	1.0	100.00 %
19-A003277	Total Nitrate + Nitrite	mg/l	0.94	1.9	1.0	96.00 %
19-A003286	Total Nitrate + Nitrite	mg/l	0.036	0.99	1.0	95.40 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.07	107. %
Total Nitrogen (TKN)	mg/l	1.00	1.05	105. %
Total Nitrate + Nitrite	mg/l	1.0	0.98	98.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2

QC Summary for sample numbers: 19-A003247 to 19-A003262...

BLANKS continued....

ANALYTE	UNITS	RESULT
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 03-106

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COUM-20190311 3247	3/11/19	23:59	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20190311 48	3/11/19	22:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190311 49	3/11/19	11:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190311 50	3/11/19	22:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190311 51	3/11/19	23:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190311 52	3/11/19	23:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190312 53	3/12/19	0:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190312 54	3/12/19	1:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190312 55	3/12/19	0:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190312 56	3/12/19	1:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Inc	3/12/19	1730	
Received by:	Amtest	3/12/19	1730	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

E4.0 client

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 03-106

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190311 3257	3/11/19	22:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190311 58	3/11/19	23:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190311 59	3/11/19	23:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20190311 60	3/11/19	23:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA6520190311 61	3/11/19	22:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
16	QA6620190311 62	3/11/19	22:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	3/12/19	1230	
Received by:	AmTest	3/12/19	12:30	EDDs - CSV
Relinquished by:				Reporting Limits:
Received by:				Fecal Coliform - 1.0 cfu/100ml
Relinquished by:				Total Nitrogen - .10 mg/L
Received by:				

F4.0 Client

R.15

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Laboratory No. 03-106

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
						Requested Analyses											
1	COLM-2018 0311	3.11.19	23:59	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018 0311	3.11.19	2240	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018 0311	3.11.19	2210	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018 0311	3.11.19	22:55	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018 0311	3.11.19	23.10	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018 0311	3.11.19	23:55	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018 0312	3.12.19	00:15	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018 0312	3.12.19	1:30	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018 0312	3.12.19	00:40	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018 0312	3.12.19	1:00	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018 0311	3.11.19	22:15	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018 0311	3.11.19	23:00	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018 0311	3.11.19	23:40	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018 0311	3.11.19	23.15	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 65 2019 0311	3.11.19	2200	Water	7	X	X	X	X	X	X	X	X	X			
16	QA 66 2019 0311	3.11.19	~~23:00~~	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 3.12.19 Received by 2220 Date 3/12/19
Firm Herrera Time 10:00 Firm ALPHA Time 10:00
Relinquished by Date 3/12/19 Received by Date 3/12/19
Firm ALPHA Time 11:44 Firm Time 1144

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No. 03-106

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses: Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0311	3.11.19	23:39	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0311	3.11.19	2240	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0311	3.11.19	2210	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0311	3.11.19	22:56	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0311	3.11.19	23.10	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0311	3.11.19	23:55	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0312	3.12.19	00:15	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0312	3.12.19	1:30	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0312	3.12.19	00:40	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0312	3.12.19	1:00	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0311	3.11.19	22:15	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0311	3.11.19	23:00	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0311	3.11.19	23:40	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0311	3.11.19	23.15	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 6/6 2019 0311	3.11.19	2200	Water	7	X	X	X	X	X	X	X	X	X			
16	QA 6/6 2019 0311	3.11.19	~~2340~~	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Muller Date 3.12.19 Received by 2220 Date 3/12/19
Firm Herrera Time 10:00 Firm ALPHA Time 10:00
Relinquished by Date 3/12/19 Received by Date 3/12/19
Firm ALPHA Time 11:44 Firm Time 1144

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Muller
Meter:	YSI Pro DSS #2
Date/Time:	3.11.19 14:15
Barometric Pressure Start of Day:	mmHg: 760.1 Time: 14:15
Barometric Pressure End of Day:	mmHg: 761.9 Time: 11:30 / 3.12.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.8	0	21.5	Herrera DI water
Conductivity (µS/cm)	1004	1,000	22.2	
Conductivity (µS/cm)	100.3	100	22.3	
DO % Saturation	101.3	100	21.8	calibrated 100.8

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	21.3	Herrera DI water
Conductivity (µS/cm)	99.0	100	22.1	
DO % Saturation	100.0	100	21.2	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000		
Personnel Performing Calibration:	M Mullen		
Meter:	YSI PRO DSS # 1		
Date/Time:	3.19.19	14:15	
Barometric Pressure Start of Day:	mmHg: 765.8	Time:	14:15
Barometric Pressure End of Day:	mmHg: 761.5	Time:	11:30 / 3.12.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.1	0	21.1	Herrera DI water
Conductivity (µS/cm)	1000	1,000	22.0	
Conductivity (µS/cm)	99.9	100	22.1	
DO % Saturation	101.5	100	20.8	calibrate 100.7

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.5	0	20.4	Herrera DI water
Conductivity (µS/cm)	98.9	100	21.4	
DO % Saturation	100.9	100	20.7	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + JL

Sample Date: 3.11.19 **Sample Time:** 23:15 PDT: X

Base Flow or Storm Event? Storm **Field Filtered Time:** 23:20 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40°

Water Quality Sampling

Sample ID: TYLMO2019-0311

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear

Color: light brown

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 4-23-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): — no tape measure

Reference Point (description): —

Water Quality Measurments

Temperature (°C) 5.2

Specific Conductivity (µs/cm) 66.8

Dissolved Oxygen (mg/L) 12.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Prescott, Ifther

Sample Date: 3/4/19 **Sample Time:** ~~23:59~~ PDT: X

Base Flow or Storm Event? Storm **Field Filtered Time:** ~~23:01:09~~ PST: X
(Must filter within 15 minutes of collection)

SITE ID: COL M

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 38°

Water Quality Sampling

Sample ID:

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous,	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	Very Light Brown
Odor:	odorless
Sheen:	NA
Floatables:	NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lee Lentz **Signature:**

Date Checked: 4-23-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS D ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.66'

Reference Point (description): Stream Gage

Water Quality Measurments

Temperature (°C) 3.4°

Specific Conductivity (µs/cm) 38.8

Dissolved Oxygen (mg/L) 12.65

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + JL

Sample Date: 3.11.19 **Sample Time:** 22:40 PDT: X

Base Flow or Storm Event? Storm **Field Filtered Time:** 22:45 PST:

(Must filter within 15 minutes of collection)

SITE ID: COVM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40

Water Quality Sampling

Sample ID: COVM12019-0311

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	-
Filter blank sample ID:	-
Transfer blank sample ID:	-

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	brown
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lamb Leath **Signature:**

Date Checked: 4-23-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.70

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.4

Specific Conductivity (µs/cm) 162.8

Dissolved Oxygen (mg/L) 12.34

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + JL

Sample Date: 03.11.19 **Sample Time:** 22:10 | 22:20 PDT: X

Base Flow or Storm Event? S **Field Filtered Time:** 22:15 | 22:20 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 40°

Water Quality Sampling

Sample ID: COUMO2019-0311

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA&C 2019-0311

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 4-23-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.44

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.7

Specific Conductivity (µs/cm) 160.9

Dissolved Oxygen (mg/L) 12.03

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: IFNER, PRESCOTT

Sample Date: 3-11-19 Sample Time: 10:55 22:55 PDT: ✓

Base Flow or Storm Event? SE Field Filtered Time: ~~11:00~~ 23:0 PST: ✓

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: RAINING 38°

Water Quality Sampling

Sample ID: EVAMS-20190311

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: Colorless

Odor: Odorless

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 4-23-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

~~YSI Pro DSS 1~~ ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.92

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.1

Specific Conductivity (µs/cm) 192

Dissolved Oxygen (mg/L) 12.39

→ Is this right? It is very high

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Prescott, Ifther

Sample Date: 3/11/19 **Sample Time:** 23:10 PDT: X

Base Flow or Storm Event? Storm **Field Filtered Time:** 23:15 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALS5

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 38°

Water Quality Sampling

Sample ID: EVALS5-20190311

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	Colorless
Odor:	odorless
Sheen:	NA
Floatables:	NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Tobias Leuth **Signature:**

Date Checked: 4-23-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.4

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.2

Specific Conductivity (µs/cm) 175

Dissolved Oxygen (mg/L) 12.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + JL

Sample Date: 3.11.19 **Sample Time:** 23:55 PDT: X

Base Flow or Storm Event? (0) **Field Filtered Time:** 00:00 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40

HERRERA

Water Quality Sampling

Sample ID: MONMN-20190311

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Susan Lentz **Signature:**

Date Checked: 4-23-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.36

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.0

Specific Conductivity (µs/cm) 160.2

Dissolved Oxygen (mg/L) 12.2

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + JL

Sample Date: 3.12.19 Sample Time: 00:15 PDT: X

Base Flow or Storm Event? (B) Field Filtered Time: 00:20 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 40°

Water Quality Sampling

Sample ID: MONMS 2019.0312

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~4.55~~ 6.55 (MM)

Reference Point (description): top of pvc pipe down

Water Quality Measurments

Temperature (°C) 5.0

Specific Conductivity (µs/cm) 279.5

Dissolved Oxygen (mg/L) 10.84

Quality Assurance

Checked By: John Lowry Signature:

Date Checked: 4-23-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + JL

Sample Date: 3.12.19 Sample Time: 1230 PDT: X

Base Flow or Storm Event? (0) Field Filtered Time: 1235 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40°

HERRERA

Water Quality Sampling

Sample ID: MONM 2019 0312

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear

Color: Colorless

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: Time:

Field/Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 4.7

Specific Conductivity (µs/cm) 186

Dissolved Oxygen (mg/L) 12.99

Quality Assurance

Checked By: John Lamb Signature:

Date Checked: 4-23-19 Time:

Data Entered into Database? YES / NO initials:

Date Entered: Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Prescott, Ifther

Sample Date: 3/12/19 **Sample Time:** 00:40 PDT ✓

Base Flow or Storm Event? Storm **Field Filtered Time:** 00:45 PST ✓

(Must filter within 15 minutes of collection)

SITE ID: SE1MN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 38°

Water Quality Sampling

Sample ID: SE1MN-20190312

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: Very Light brown

Odor: odorless

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Ifther **Signature:**

Date Checked: 4-23-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.53

Reference Point (description): Botton of Bolt

Water Quality Measurments

Temperature (°C) 3.4°

Specific Conductivity (µs/cm) 50.6

Dissolved Oxygen (mg/L) 13.25

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM & JL

Sample Date: 3.12.19 Sample Time: 1:06 PDT X

Base Flow or Storm Event? (S) Field Filtered Time: 1:05 PST

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40°

HERRERA

Water Quality Sampling

Sample ID: SEIMS 2019 0302

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N D
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: ~

Filter blank sample ID: ~

Transfer blank sample ID: ~

Visual and Olfactory Conditions:

Clarity: clear

Color: Tannin

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 4-23-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.99

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.2

Specific Conductivity (µs/cm) 85.4

Dissolved Oxygen (mg/L) 11.95

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Iftyler, Prescott

Sample Date: 3/11/19 Sample Time: 22:15 PDT: X

Base Flow or Storm Event? Storm Field Filtered Time: 22:20 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Raining 38°

Water Quality Sampling

Sample ID: TOSMI-20190311

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID: QAGS-20190311 10:00

Visual and Olfactory Conditions:

Clarity: Slightly turbid

Color: V. Lt. brown

Odor: None

Sheen: None

Floatables: None

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: S. Lee Signature:

Date Checked: 4-23-19 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 ✓

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.93

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.9°

Specific Conductivity (µs/cm) 280

Dissolved Oxygen (mg/L) 12.47

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 4/3/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 3/11-12/2019 / All locations, QA66 (COUMO) QA65 (TB) Lab Ref No 1903-106

date 4/23/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	4	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	91	**±20**	4	**≤ 25**	1.2	**≤ 25**	OK	TB=ND NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	2	**≤ 25**	4.2	**≤ 25**	OK	TB=ND NONE
Hardness	OK / SM 2340B	NA	**NA**	8	**≤180**	≤1.0 mg/L 1.0 mg/L	108,109	**±25**	105	**±15**	1,1	**≤ 20**	1.5	**≤ 20**	OK	TB=ND NONE
DOC	OK / SM 5310B	<15	**≤15**	8	**≤28**	≤1.0 mg/L 1.0 mg/L	111	**±25**	98	**±15**	2	**≤ 20**	D=0.1	**≤ 20**	OK	TB=ND NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	4	**≤28**	≤0.01 mg/L 0.01 mg/L	93	**±25**	94	**±20**	5	**≤ 20**	11	**≤ 20**	OK	TB=ND NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	3-8	**≤28**	≤0.1 mg/L 0.1 mg/L	93-115	**±25**	98-107	**±20**	2.7-9.8	**≤ 20**	2.0 0	**≤ 20**	OK	TB=ND NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 4/3/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 3/11-12/2019 / All locations, QA66 (COUMO) QA65 (TB) Lab Ref No 1903-106

date 4/23/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤1.0 µg/L 1.0 µg/L	102,100	**±25**	NR	**±15**	NC, 2	**≤ 20**	14	**≤ 20**	OK	TB=ND NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	122,120	**±25**	NR	**±15**	NC, 2	**≤ 20**	19	**≤ 20**	OK	TB=ND NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	7	**≤180**	≤1.0 µg/L 1.0 µg/L	92,95	**±25**	NR	**±15**	3,NC	**≤ 20**	3.1	**≤ 20**	OK	TB=3.2;SEE BELOW NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	98,99	**±25**	NR	**±15**	1,NC	**≤ 20**	D=1	**≤ 20**	OK	TB=ND NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	<1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	70, NC	**≤ 35**	117	**≤ 50**	OK	TB=ND J COUM DUE TO LAB DUP J COUMO DUE TO FD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Flag J due to TB result: COUMI, COUMO, MONMN, MONMS, MONM, TOSMI, TOSMO, TYLMI, TYLMO (all other samples ND)

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

May 21, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1904-308

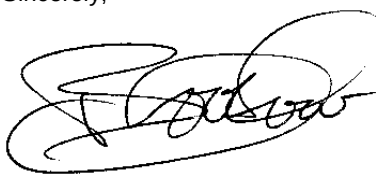
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on April 26, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

Case Narrative

Samples were collected on April 26, 2019 and received by the laboratory on April 26, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190426**					
Laboratory ID:	04-308-01					
Total Suspended Solids	**2.4**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**COUMI-20190426**					
Laboratory ID:	04-308-02					
Total Suspended Solids	**12**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**COUMO-20190426**					
Laboratory ID:	04-308-03					
Total Suspended Solids	**4.8**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**EVAMS-20190426**					
Laboratory ID:	04-308-04					
Total Suspended Solids	**4.0**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**EVALSS-20190426**					
Laboratory ID:	04-308-05					
Total Suspended Solids	**7.2**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**MONMN-20190426**					
Laboratory ID:	04-308-06					
Total Suspended Solids	**2.2**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**MONMS-20190426**					
Laboratory ID:	04-308-07					
Total Suspended Solids	**1.0**	1.0	SM 2540D	5-1-19	5-2-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190426**					
Laboratory ID:	04-308-08					
Total Suspended Solids	**1.6**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**SEIMN-20190426**					
Laboratory ID:	04-308-09					
Total Suspended Solids	**4.2**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**SEIMS-20190426**					
Laboratory ID:	04-308-10					
Total Suspended Solids	**3.0**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**TOSMI-20190426**					
Laboratory ID:	04-308-11					
Total Suspended Solids	**8.8**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**TOSMO-20190426**					
Laboratory ID:	04-308-12					
Total Suspended Solids	**19**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**TYLMI-20190426**					
Laboratory ID:	04-308-13					
Total Suspended Solids	**3.8**	1.0	SM 2540D	5-1-19	5-2-19	
Client ID:	**TYLMO-20190426**					
Laboratory ID:	04-308-14					
Total Suspended Solids	**1.8**	1.0	SM 2540D	5-1-19	5-2-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA67-20190426**					
Laboratory ID:	04-308-15					
Total Suspended Solids	**4.2**	1.0	SM 2540D	5-1-19	5-2-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0501W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	5-1-19	5-2-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	04-308-04								
	ORIG	DUP							
Total Suspended Solids	**4.00**	**3.80**	NA	NA	NA	NA	5	23	
SPIKE BLANK									
Laboratory ID:	SB0501W1								
	SB		SB		SB				
Total Suspended Solids	**111**		100	NA	111	69-122	NA	NA	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190426**					
Laboratory ID:	04-308-01					
Turbidity	**1.6**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**COUMI-20190426**					
Laboratory ID:	04-308-02					
Turbidity	**6.2**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**COUMO-20190426**					
Laboratory ID:	04-308-03					
Turbidity	**3.7**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**EVAMS-20190426**					
Laboratory ID:	04-308-04					
Turbidity	**2.6**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**EVALSS-20190426**					
Laboratory ID:	04-308-05					
Turbidity	**3.5**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**MONMN-20190426**					
Laboratory ID:	04-308-06					
Turbidity	**1.5**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**MONMS-20190426**					
Laboratory ID:	04-308-07					
Turbidity	**1.1**	0.10	EPA 180.1	4-26-19	4-26-19	

Date of Report: May 21, 2019
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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190426**					
Laboratory ID:	04-308-08					
Turbidity	**1.7**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**SEIMN-20190426**					
Laboratory ID:	04-308-09					
Turbidity	**2.5**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**SEIMS-20190426**					
Laboratory ID:	04-308-10					
Turbidity	**1.7**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**TOSMI-20190426**					
Laboratory ID:	04-308-11					
Turbidity	**4.9**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**TOSMO-20190426**					
Laboratory ID:	04-308-12					
Turbidity	**8.0**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**TYLMI-20190426**					
Laboratory ID:	04-308-13					
Turbidity	**2.3**	0.10	EPA 180.1	4-26-19	4-26-19	
Client ID:	**TYLMO-20190426**					
Laboratory ID:	04-308-14					
Turbidity	**1.8**	0.10	EPA 180.1	4-26-19	4-26-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA67-20190426**					
Laboratory ID:	04-308-15					
Turbidity	**2.6**	0.10	EPA 180.1	4-26-19	4-26-19	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0426W1					
Turbidity	**ND**	0.10	EPA 180.1	4-26-19	4-26-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	04-308-01								
	ORIG	DUP							
Turbidity	**1.56**	**1.46**	NA	NA	NA	NA	7	15	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190426**					
Laboratory ID:	04-308-01					
Hardness	**16**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**COUMI-20190426**					
Laboratory ID:	04-308-02					
Hardness	**150**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**COUMO-20190426**					
Laboratory ID:	04-308-03					
Hardness	**130**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**EVAMS-20190426**					
Laboratory ID:	04-308-04					
Hardness	**98**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**EVALSS-20190426**					
Laboratory ID:	04-308-05					
Hardness	**91**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**MONMN-20190426**					
Laboratory ID:	04-308-06					
Hardness	**82**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**MONMS-20190426**					
Laboratory ID:	04-308-07					
Hardness	**140**	1.0	200.7/SM 2340B	5-6-19	5-6-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190426**					
Laboratory ID:	04-308-08					
Hardness	**100**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**SEIMN-20190426**					
Laboratory ID:	04-308-09					
Hardness	**30**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**SEIMS-20190426**					
Laboratory ID:	04-308-10					
Hardness	**49**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**TOSMI-20190426**					
Laboratory ID:	04-308-11					
Hardness	**130**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**TOSMO-20190426**					
Laboratory ID:	04-308-12					
Hardness	**120**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**TYLMI-20190426**					
Laboratory ID:	04-308-13					
Hardness	**95**	1.0	200.7/SM 2340B	5-6-19	5-6-19	
Client ID:	**TYLMO-20190426**					
Laboratory ID:	04-308-14					
Hardness	**91**	1.0	200.7/SM 2340B	5-6-19	5-6-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA67-20190426**					
Laboratory ID:	04-308-15					
Hardness	**30**	1.0	200.7/SM 2340B	5-6-19	5-6-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0506WH1					
Hardness	**ND**	1.0	200.7/SM 2340B	5-6-19	5-6-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	04-308-07										
	ORIG	DUP									
Hardness	**136**	**136**	NA		NA	NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	04-308-07										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**274**	**281**	132	132	136	105	110	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB0506WH1										
	SB		SB			SB					
Hardness	**142**		132		NA	108		80-120	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190426**					
Laboratory ID:	04-308-01					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	4-29-19	4-29-19	
Client ID:	**COUMI-20190426**					
Laboratory ID:	04-308-02					
Dissolved Organic Carbon	**3.5**	1.0	SM 5310B	4-29-19	4-29-19	
Client ID:	**COUMO-20190426**					
Laboratory ID:	04-308-03					
Dissolved Organic Carbon	**3.0**	1.0	SM 5310B	4-29-19	4-29-19	
Client ID:	**EVAMS-20190426**					
Laboratory ID:	04-308-04					
Dissolved Organic Carbon	**2.9**	1.0	SM 5310B	4-29-19	4-29-19	
Client ID:	**EVALSS-20190426**					
Laboratory ID:	04-308-05					
Dissolved Organic Carbon	**3.1**	1.0	SM 5310B	4-29-19	4-29-19	
Client ID:	**MONMN-20190426**					
Laboratory ID:	04-308-06					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	4-29-19	4-29-19	
Client ID:	**MONMS-20190426**					
Laboratory ID:	04-308-07					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	4-29-19	4-29-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190426**					
Laboratory ID:	04-308-08					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	5-2-19	5-2-19	
Client ID:	**SEIMN-20190426**					
Laboratory ID:	04-308-09					
Dissolved Organic Carbon	**6.6**	1.0	SM 5310B	5-2-19	5-2-19	
Client ID:	**SEIMS-20190426**					
Laboratory ID:	04-308-10					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	5-2-19	5-2-19	
Client ID:	**TOSMI-20190426**					
Laboratory ID:	04-308-11					
Dissolved Organic Carbon	**2.6**	1.0	SM 5310B	5-2-19	5-2-19	
Client ID:	**TOSMO-20190426**					
Laboratory ID:	04-308-12					
Dissolved Organic Carbon	**2.7**	1.0	SM 5310B	5-2-19	5-2-19	
Client ID:	**TYLMI-20190426**					
Laboratory ID:	04-308-13					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	5-2-19	5-2-19	
Client ID:	**TYLMO-20190426**					
Laboratory ID:	04-308-14					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	5-2-19	5-2-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA67-20190426**					
Laboratory ID:	04-308-15					
Dissolved Organic Carbon	**6.7**	1.0	SM 5310B	5-2-19	5-2-19	
Client ID:	**QA68-20190426**					
Laboratory ID:	04-308-16					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	5-2-19	5-2-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0429D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	4-29-19	4-29-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	04-308-01								
	ORIG	DUP							
Dissolved Organic Carbon	**11.7**	**11.9**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	04-308-01								
	MS		MS		MS				
Dissolved Organic Carbon	**22.3**		10.0	11.7	106	75-125	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0429D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.0**		10.0	NA	110	80-120	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190426**					
Laboratory ID:	04-308-01					
Total Phosphorus	**0.014**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**COUMI-20190426**					
Laboratory ID:	04-308-02					
Total Phosphorus	**0.13**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**COUMO-20190426**					
Laboratory ID:	04-308-03					
Total Phosphorus	**0.051**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**EVAMS-20190426**					
Laboratory ID:	04-308-04					
Total Phosphorus	**0.015**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**EVALSS-20190426**					
Laboratory ID:	04-308-05					
Total Phosphorus	**0.024**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**MONMN-20190426**					
Laboratory ID:	04-308-06					
Total Phosphorus	**0.028**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**MONMS-20190426**					
Laboratory ID:	04-308-07					
Total Phosphorus	**0.010**	0.010	EPA 365.1	5-2-19	5-3-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190426**					
Laboratory ID:	04-308-08					
Total Phosphorus	**0.024**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**SEIMN-20190426**					
Laboratory ID:	04-308-09					
Total Phosphorus	**0.022**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**SEIMS-20190426**					
Laboratory ID:	04-308-10					
Total Phosphorus	**0.032**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**TOSMI-20190426**					
Laboratory ID:	04-308-11					
Total Phosphorus	**0.065**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**TOSMO-20190426**					
Laboratory ID:	04-308-12					
Total Phosphorus	**0.064**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**TYLMI-20190426**					
Laboratory ID:	04-308-13					
Total Phosphorus	**0.020**	0.010	EPA 365.1	5-2-19	5-3-19	
Client ID:	**TYLMO-20190426**					
Laboratory ID:	04-308-14					
Total Phosphorus	**0.032**	0.010	EPA 365.1	5-2-19	5-3-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA67-20190426**					
Laboratory ID:	04-308-15					
Total Phosphorus	**0.025**	0.010	EPA 365.1	5-2-19	5-3-19	

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Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0502W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	5-2-19	5-3-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	04-308-01								
	ORIG	DUP							
Total Phosphorus	**0.0140**	**0.0130**	NA	NA	NA	NA	7	14	
MATRIX SPIKE									
Laboratory ID:	04-308-01								
	MS		MS		MS				
Total Phosphorus	**0.250**		0.250	0.0140	94	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0502W1								
	SB		SB		SB				
Total Phosphorus	**0.226**		0.250	NA	90	78-113	NA	NA	

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Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190426**					
Laboratory ID:	04-308-01					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**COUMI-20190426**					
Laboratory ID:	04-308-02					
Copper	**1.5**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**19**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**COUMO-20190426**					
Laboratory ID:	04-308-03					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**12**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**EVAMS-20190426**					
Laboratory ID:	04-308-04					
Copper	**ND**	1.0	EPA 200.8	4-30-19	4-30-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	4-30-19	
Client ID:	**EVALSS-20190426**					
Laboratory ID:	04-308-05					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**MONMN-20190426**					
Laboratory ID:	04-308-06					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**MONMS-20190426**					
Laboratory ID:	04-308-07					
Copper	**1.0**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	5-1-19	

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190426**					
Laboratory ID:	04-308-08					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**9.5**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**SEIMN-20190426**					
Laboratory ID:	04-308-09					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**SEIMS-20190426**					
Laboratory ID:	04-308-10					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**TOSMI-20190426**					
Laboratory ID:	04-308-11					
Copper	**2.7**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**59**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**TOSMO-20190426**					
Laboratory ID:	04-308-12					
Copper	**1.7**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**34**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**TYLMI-20190426**					
Laboratory ID:	04-308-13					
Copper	**2.3**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**11**	5.0	EPA 200.8	4-30-19	5-1-19	
Client ID:	**TYLMO-20190426**					
Laboratory ID:	04-308-14					
Copper	**1.1**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**6.3**	5.0	EPA 200.8	4-30-19	5-1-19	

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA67-20190426**					
Laboratory ID:	04-308-15					
Copper	**ND**	1.0	EPA 200.8	4-30-19	5-1-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	5-1-19	

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0430WH1					
Copper	**ND**	1.0	EPA 200.8	4-30-19	4-30-19	
Zinc	**ND**	5.0	EPA 200.8	4-30-19	4-30-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	04-308-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	04-308-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**81.6**	**84.0**	100	100	ND	**82**	**84**	75-125	3	20	
Zinc	**111**	**116**	100	100	ND	**111**	**116**	75-125	5	20	

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190426**					
Laboratory ID:	04-308-01					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	
Client ID:	**COUMI-20190426**					
Laboratory ID:	04-308-02					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	
Client ID:	**COUMO-20190426**					
Laboratory ID:	04-308-03					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**6.6**	5.0	EPA 200.8		4-30-19	
Client ID:	**EVAMS-20190426**					
Laboratory ID:	04-308-04					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	
Client ID:	**EVALSS-20190426**					
Laboratory ID:	04-308-05					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	
Client ID:	**MONMN-20190426**					
Laboratory ID:	04-308-06					
Copper	**1.1**	1.0	EPA 200.8		5-1-19	
Zinc	**ND**	5.0	EPA 200.8		5-1-19	
Client ID:	**MONMS-20190426**					
Laboratory ID:	04-308-07					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190426**					
Laboratory ID:	04-308-08					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**7.3**	5.0	EPA 200.8		4-30-19	
Client ID:	**SEIMN-20190426**					
Laboratory ID:	04-308-09					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	
Client ID:	**SEIMS-20190426**					
Laboratory ID:	04-308-10					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	
Client ID:	**TOSMI-20190426**					
Laboratory ID:	04-308-11					
Copper	**1.4**	1.0	EPA 200.8		4-30-19	
Zinc	**24**	5.0	EPA 200.8		4-30-19	
Client ID:	**TOSMO-20190426**					
Laboratory ID:	04-308-12					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**12**	5.0	EPA 200.8		4-30-19	
Client ID:	**TYLMI-20190426**					
Laboratory ID:	04-308-13					
Copper	**1.8**	1.0	EPA 200.8		4-30-19	
Zinc	**5.6**	5.0	EPA 200.8		4-30-19	
Client ID:	**TYLMO-20190426**					
Laboratory ID:	04-308-14					
Copper	**1.1**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA67-20190426**					
Laboratory ID:	04-308-15					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	
Client ID:	**QA68-20190426**					
Laboratory ID:	04-308-16					
Copper	**2.9**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	

Date of Report: May 21, 2019
Samples Submitted: April 26, 2019
Laboratory Reference: 1904-308
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0430D1					
Copper	**ND**	1.0	EPA 200.8		4-30-19	
Zinc	**ND**	5.0	EPA 200.8		4-30-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	04-308-16										
	ORIG	DUP									
Copper	**2.92**	**3.04**	NA	NA		NA		NA	4	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	04-308-16										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**72.8**	**67.4**	80.0	80.0	2.92	**87**	**81**	75-125	8	20	
Zinc	**78.6**	**73.8**	80.0	80.0	ND	**98**	**92**	75-125	6	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

May 17 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COUM-20190426	Water	19-A005754	Micro, NUT
COUMI-20190426	Water	19-A005755	Micro, NUT
COUMO-20190426	Water	19-A005756	Micro, NUT
EVAMS-20190426	Water	19-A005757	Micro, NUT
EVALSS-20190426	Water	19-A005758	Micro, NUT
MONMN-20190426	Water	19-A005759	Micro, NUT
MONMS-20190426	Water	19-A005760	Micro, NUT
MONM-20190426	Water	19-A005761	Micro, NUT
SEIMN-20190426	Water	19-A005762	Micro, NUT
SEIMS-20190426	Water	19-A005763	Micro, NUT
TOSMI-20190426	Water	19-A005764	Micro, NUT
TOSMO-20190426	Water	19-A005765	Micro, NUT
TYLMI-20190426	Water	19-A005766	Micro, NUT
TYLMO-20190426	Water	19-A005767	Micro, NUT
QA6720190426	Water	19-A005768	Micro, NUT

Your samples were received on Friday, April 26, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

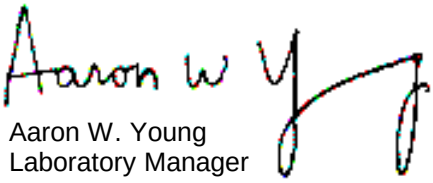
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

May 17 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 04-308

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 04-308
All results reported on an as received basis.

Date Received: 04/26/19
Date Reported: 5/17/19

AMTEST Identification Number **19-A005754**
Client Identification **COUM-20190426**
Sampling Date **04/26/19, 10:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	24.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.59	mg/l		0.1			
Total Nitrogen (TKN)	0.560	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.032	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005755**
Client Identification **COUMI-20190426**
Sampling Date **04/26/19, 13:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	18.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.25	mg/l		0.1			
Total Nitrogen (TKN)	< 0.2	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.25	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005756**
Client Identification **COUMO-20190426**
Sampling Date **04/26/19, 13:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	150	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.27	mg/l		0.1			
Total Nitrogen (TKN)	< 0.2	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005757**
Client Identification **EVAMS-20190426**
Sampling Date **04/26/19, 12:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	6.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	2.51	mg/l		0.1			
Total Nitrogen (TKN)	0.507	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	2.0	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005758**
Client Identification **EVALSS-20190426**
Sampling Date **04/26/19, 12:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	8.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	1.77	mg/l		0.1			
Total Nitrogen (TKN)	0.473	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	1.3	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005759**
Client Identification **MONMN-20190426**
Sampling Date **04/26/19, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.52	mg/l		0.1			
Total Nitrogen (TKN)	0.403	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005760**
Client Identification **MONMS-20190426**
Sampling Date **04/26/19, 08:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	250	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.521	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.16	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005761**
Client Identification **MONM-20190426**
Sampling Date **04/26/19, 08:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	16.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.483	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.32	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005762**
Client Identification **SEIMN-20190426**
Sampling Date **04/26/19, 10:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.60	mg/l		0.1			
Total Nitrogen (TKN)	0.502	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.10	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005763**
Client Identification **SEIMS-20190426**
Sampling Date **04/26/19, 09:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	12.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.525	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.16	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005764**
Client Identification **TOSMI-20190426**
Sampling Date **04/26/19, 13:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	320	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	1.38	mg/l		0.1			
Total Nitrogen (TKN)	0.580	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.80	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005765**
Client Identification **TOSMO-20190426**
Sampling Date **04/26/19, 14:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	98.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.43	mg/l		0.1			
Total Nitrogen (TKN)	< 0.2	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.43	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005766**
Client Identification **TYLMI-20190426**
Sampling Date **04/26/19, 11:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	18.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	1.10	mg/l		0.1			
Total Nitrogen (TKN)	0.518	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.58	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005767**
Client Identification **TYLMO-20190426**
Sampling Date **04/26/19, 11:30**

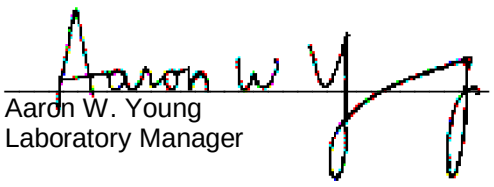
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	18.	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.441	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.18	mg/l		0.02	SM4500NO3	AG	04/30/19

AMTEST Identification Number **19-A005768**
Client Identification **QA6720190426**
Sampling Date **04/26/19, 10:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	NG	04/26/19
Total Nitrogen (NOX&TKN)	0.64	mg/l		0.1			
Total Nitrogen (TKN)	0.526	mg/l		0.2	SM4500N	AG	05/08/19
Total Nitrate + Nitrite	0.11	mg/l		0.02	SM4500NO3	AG	04/30/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 19-A005754 to 19-A005768

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A005754	Fecal coliform	CFU/100 ml	24.	22.	8.7
19-A005768	Fecal coliform	CFU/100 ml	< 2	4.	
19-A005516	Total Nitrogen (TKN)	mg/l	0.475	0.502	5.5
19-A005756	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
19-A005766	Total Nitrogen (TKN)	mg/l	0.518	0.660	24.
19-A005970	Total Nitrogen (TKN)	mg/l	4.00	3.34	18.
19-A005524	Total Nitrate + Nitrite	mg/l	1.7	1.6	6.1
19-A005549	Total Nitrate + Nitrite	mg/l	0.17	0.19	11.
19-A005573	Total Nitrate + Nitrite	mg/l	0.11	0.10	9.5
19-A005686	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
19-A005758	Total Nitrate + Nitrite	mg/l	1.3	1.4	7.4
19-A005768	Total Nitrate + Nitrite	mg/l	0.11	0.12	8.7

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A005516	Total Nitrogen (TKN)	mg/l	0.475	2.52	2.00	102.25 %
19-A005756	Total Nitrogen (TKN)	mg/l	< 0.2	1.43	1.00	143.00 %
19-A005766	Total Nitrogen (TKN)	mg/l	0.518	2.72	2.00	110.10 %
19-A005524	Total Nitrate + Nitrite	mg/l	1.7	2.8	1.0	110.00 %
19-A005549	Total Nitrate + Nitrite	mg/l	0.17	1.2	1.0	103.00 %
19-A005573	Total Nitrate + Nitrite	mg/l	0.11	1.1	1.0	99.00 %
19-A005686	Total Nitrate + Nitrite	mg/l	< 0.02	1.0	1.0	100.00 %
19-A005758	Total Nitrate + Nitrite	mg/l	1.3	2.1	1.0	80.00 %
19-A005768	Total Nitrate + Nitrite	mg/l	0.11	1.1	1.0	99.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.01	101. %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2

QC Summary for sample numbers: 19-A005754 to 19-A005768...

BLANKS continued....

ANALYTE	UNITS	RESULT
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

P.13

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 04-308

Laboratory: AmTest Laboratories

Turnaround Request

Project Manager: Blair Goodrow

Attention: Aaron Young

1 Day 2 Day 3 Day

email: bgoodrow@onsite-env.com

13600 NE 126th Pl Kirkland, WA 98034

Standard

Project Number: 14-05806-000

Phone Number: (425) 885-1664

Other: _____

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COUM-20190426 5754	4/26/19	10:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20190426 55	4/26/19	13:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190426 56	4/26/19	13:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190426 57	4/26/19	12:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190426 58	4/26/19	12:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190426 59	4/26/19	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190426 60	4/26/19	8:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190426 61	4/26/19	8:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190426 62	4/26/19	10:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190426 63	4/26/19	9:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE EV	4/26/19	1535	
Received by:	AMTEST T=4.2	4/26/19	3:35	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CLIENT

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 04-308

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190426 5764	4/26/19	13:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190426 65	4/26/19	14:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190426 66	4/26/19	11:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20190426 67	4/26/19	11:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA6720190426 68	4/26/19	10:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OES via Fed Ex	4/26/19	1535	
Received by:	AMTEST T=4.2	4/26/19	3:35	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CLIENT

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 04-308

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D) *	Turbidity (EPA 181.1) *	Hardness (EPA 200.7 / SM 2340B) *	Dissolved Organ Carbon (SM 5310B) * *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1) *	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8) *	Dissolved Cu and Zn (EPA 200.8) * *			
1	COLM-2018[9] 0426	042619	10:40	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2018[9] 0426		1340	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2018[9] 0426		1325	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2018[9] 0426		1220	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2018[9] 0426		1235	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2018[9] 0426		0730	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2018[9] 0426		0800	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2018[9] 0426		0825	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2018[9] 0426		10:00	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2018[9] 0426		0900	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2018[9] 0426		1300	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2018[9] 0426		1400	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2018[9] 0426		1155	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2018[9] 0426		1130	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 07-20190426		10:40	Water	7	X	X	X	X	X	X	X	X	X			
16	QA68-20190426		1410	Water	2				X					X			

Relinquished by Meghan Mullen Date 4.26-19 Received by Here Cloe Date 4/26/19
Firm Herrera Time 14:25 Firm OE Time 1426
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 04-308

Page 1 of 1

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
	COLM-20190426	042619	10:40	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-20190426		1340	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-20190426		1325	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-20190426		1220	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-20190426		1235	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-20190426		0730	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-20190426		0800	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-20190426		0825	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-20190426		10:00	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-20190426		0900	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-20190426		1300	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-20190426		1400	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-20190426		1155	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-20190426		1130	Water	7	X	X	X	X	X	X	X	X	X			
	QA 07-20190426		10:10	Water	7	X	X	X	X	X	X	X	X	X			
	QA608-20190426		1410	Water	2				X					X			

Relinquished by Meghan Mullen Date 4.26-19 Received by [illegible] Date 4/25/19
Firm Herrera Time 14:25 Firm OE Time 1426
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000	Meghan Mullen	
Personnel Performing Calibration:	~~Kyle Bliss + Charlotte Kaiser~~		
Meter:	YSI Pro DSS #2		
Date/Time: 4.25.18	04/18/18	900 PM	
Barometric Pressure Start of Day:	mmHg: 767.1	Time: 410 PM	
Barometric Pressure End of Day:	mmHg: 769.6	Time: 13:00 / 4.26.18	

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm) 0.8	~~48~~	0	23.4	No Cal
Conductivity (µS/cm) 1023	974	1,000	23.2	calibrated now = 1000
Conductivity (µS/cm) 100.6	98.4	100	22.8	
DO % Saturation 101.2	101	100	23.0	Measures 100.5 calibrated = 100.9

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.5	0	23.0	
Conductivity (µS/cm)	99.5	100	23.0	
DO % Saturation	~~101.6~~ 101.4	100	22.3	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 04/26/19 **Sample Time:** 1030 PDT: X

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 1035 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: sunny, 50°F

Water Quality Sampling

Sample ID: TYLMO-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lovell **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.85

Reference Point (description): top of arch dam

Water Quality Measurments

Temperature (°C) 10.2

Specific Conductivity (µs/cm) 193.5

Dissolved Oxygen (mg/L) 11.39

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Nina, Xiao, Meghan

Sample Date: 4.26.19 **Sample Time:** 10:40 PDT X

Base Flow or Storm Event? (0) **Field Filtered Time:** 10:45 PST

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny, 60°

Water Quality Sampling

Sample ID: COLM-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	—
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

Clarity:	clear
Color:	yellow/tan
Odor:	none
Sheen:	none
Floatables:	foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.53

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.0

Specific Conductivity (µs/cm) 47.3

Dissolved Oxygen (mg/L) 10.15

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 Sample Time: 1340 PDT: X

Base Flow or Storm Event? Baseflow Field Filtered Time: 1345 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: SUNNY, 55F

Water Quality Sampling

Sample ID: COUMI-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: slight turb.

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Sabrina Levitt Signature:

Date Checked: 6-23-2019 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.60

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.5

Specific Conductivity (µs/cm) 308.7

Dissolved Oxygen (mg/L) 10.98

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 **Sample Time:** 1325 PDT: X

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 1330 PST

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Sunny, 55°F

Water Quality Sampling

Sample ID: COUMO-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Field/Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.28

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.1

Specific Conductivity (µs/cm) 279.9

Dissolved Oxygen (mg/L) 10.78

Quality Assurance

Checked By: John Lentz **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 **Sample Time:** 1220 PDT: X

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 1225 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: sunny, 55°F

Water Quality Sampling

Sample ID: EVAMS-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: -

Filter blank sample ID: -

Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.88

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.3

Specific Conductivity (µs/cm) 213.4

Dissolved Oxygen (mg/L) 11.12

Quality Assurance

Checked By: John Leth **Signature:**

Date Checked: 6/13/2019 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 **Sample Time:** 1235 PDT X PST

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 1240
(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: sunny, 55F

Water Quality Sampling

Sample ID: EVALSS-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: clear
Color: none
Odor: none
Sheen: none
Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.2

Specific Conductivity (µs/cm) 196.7

Dissolved Oxygen (mg/L) 11.35

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NM + XN + MM

Sample Date: 4.26.19 **Sample Time:** 7:30 PDT ✓ PST

Base Flow or Storm Event?

Field Filtered Time: 7:35 (Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 50° sunny

Water Quality Sampling

Sample ID: MONMN-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: non none

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Edan Leith **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.11

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.3

Specific Conductivity (µs/cm) 188.2

Dissolved Oxygen (mg/L) 10.45

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 Sample Time: 0800 PDT X PST

Base Flow or Storm Event? Base flow Field Filtered Time: 0805 (Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Sunny 50°F

Water Quality Sampling

Sample ID: MONMS-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: —

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Leuth Signature:

Date Checked: 6/5/2019 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.83

Reference Point (description): top of PVC

Water Quality Measurments

Temperature (°C) 9.4

Specific Conductivity (µs/cm) 310.3

Dissolved Oxygen (mg/L) 8.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 **Sample Time:** 0825 PDT: X

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 0830 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny, 50°F

Water Quality Sampling

Sample ID: MONM-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	-
Filter blank sample ID:	-
Transfer blank sample ID:	-

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leutz **Signature:**

Date Checked: 6.13.2019 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): —

Reference Point (description): —

Water Quality Measurments

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 225.2

Dissolved Oxygen (mg/L) 11.42

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19

Base Flow or Storm Event? Baseflow

Sample Time: 10:00 | QA67 10:10 | PDT x

Field Filtered Time: 10:05 | 10:15 | PST

(Must filter within 15 minutes of collection)

SITE ID: SEI MN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp:

Water Quality Sampling

Sample ID: SEIMN-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	YES NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA67-20190426

Filter blank sample ID: -

Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: some foam

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lenth Signature:

Date Checked: 6-13-2019 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.62

Reference Point (description): top of bolt on side down

Water Quality Measurments

Temperature (°C) 9.0

Specific Conductivity (µs/cm) 68.1

Dissolved Oxygen (mg/L) 11.51

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 Sample Time: 0900 PDT: X

Base Flow or Storm Event? Baseflow Field Filtered Time: 0905 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Sunny, 50°F

Water Quality Sampling

Sample ID: SEIMS-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Leath Signature:

Date Checked: 6.13.209 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.75

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 111.9

Dissolved Oxygen (mg/L) 10.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 **Sample Time:** 1300 PDT X

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 1305 PST

(Must filter within 15 minutes of collection)

SITE ID: TOSM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: sunny, 55°F

Water Quality Sampling

Sample ID: TOSMI-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: -

Filter blank sample ID: -

Transfer blank sample ID: -

Visual and Olfactory Conditions:

Clarity: slight turbidity

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leutha **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.78

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.2

Specific Conductivity (µs/cm) 299.7

Dissolved Oxygen (mg/L) 10.75

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 **Sample Time:** 1400 FB PDT: X

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 1405 14:10 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny 55°F

Water Quality Sampling

Sample ID: TOSMO-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	Yes
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	NO
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	Yes
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	NO

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: QAGB-20190426

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: cloudy

Color: grey

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leutt **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.56

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.2

Specific Conductivity (µs/cm) 256.8

Dissolved Oxygen (mg/L) 11.09

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM, XW, NM

Sample Date: 4/26/19 **Sample Time:** 1155 PDT: X

Base Flow or Storm Event? Baseflow **Field Filtered Time:** 1200 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: sunny, 50°F

Water Quality Sampling

Sample ID: TYLMI-20190426

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	–
Filter blank sample ID:	–
Transfer blank sample ID:	–

Visual and Olfactory Conditions:

Clarity:	slight turbidity
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 6-13-2019 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.65

Reference Point (description): top of culvert dam

Water Quality Measurments

Temperature (°C) 11.6

Specific Conductivity (µs/cm) 201.4

Dissolved Oxygen (mg/L) 10.28

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 6/5/2019 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 4/26/2019 / All locations, QA67 (SEIMN) QA68 (FB) Lab Ref No 1904-308

date 6/13/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	6	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	111	**±20**	5	**≤ 25**	1.2	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	7	**≤ 25**	3.9	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	10	**≤180**	≤1.0 mg/L 1.0 mg/L	105,110	**±25**	108	**±15**	0, 3	**≤ 20**	0	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	3	**≤28**	≤1.0 mg/L 1.0 mg/L	106	**±25**	110	**±15**	2	**≤ 20**	1.5	**≤ 20**	OK	FB=ND NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	94	**±25**	90	**±20**	7	**≤ 20**	D=0.003	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	4-12	**≤28**	≤0.1 mg/L 0.1 mg/L	143,10 80,99	**±25**	94-104	**±20**	D=0.142, NC 7.4,8.7	**≤ 20**	D=0.024 D=0.01	**≤ 20**	OK	MS %R HIGH, BUT SAMPLE ND, NO FLAG.

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 6/5/2019 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 4/26/2019 / All locations, QA67 (SEIMN) QA68 (FB) Lab Ref No 1904-308

date 6/13/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	82,84	**±25**	NR	**±15**	NC,3	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	111,116	**±25**	NR	**±15**	NC, 5	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	4	**≤180**	≤1.0 µg/L 1.0 µg/L	87,81	**±25**	NR	**±15**	4,8	**≤ 20**	NC	**≤ 20**	OK	FB=2.9;SEE BELOW
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	98,92	**±25**	NR	**±15**	NC,6	**≤ 20**	NC	**≤ 20**	OK	FB=ND NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	<1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	8.7, NC	**≤ 35**	NC	**≤ 50**	OK	J COUM DUE TO LAB DUP J COUMO DUE TO FD

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Flag J due to FB result: MONMN, TOSMI, TYLMI, TYLMO (all other samples ND)

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

August 14, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1907-114

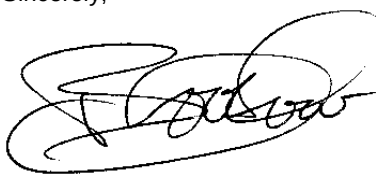
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on July 10, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

Case Narrative

Samples were collected on July 10, 2019 and received by the laboratory on July 10, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190710**					
Laboratory ID:	07-114-01					
Total Suspended Solids	**6.6**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**COUMI-20190710**					
Laboratory ID:	07-114-02					
Total Suspended Solids	**39**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**COUMO-20190710**					
Laboratory ID:	07-114-03					
Total Suspended Solids	**32**	2.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**EVAMS-20190710**					
Laboratory ID:	07-114-04					
Total Suspended Solids	**12**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**EVALSS-20190710**					
Laboratory ID:	07-114-05					
Total Suspended Solids	**11**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**MONMN-20190710**					
Laboratory ID:	07-114-06					
Total Suspended Solids	**29**	2.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**MONMS-20190710**					
Laboratory ID:	07-114-07					
Total Suspended Solids	**5.6**	1.0	SM 2540D	7-12-19	7-12-19	

Date of Report: August 14, 2019
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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190710**					
Laboratory ID:	07-114-08					
Total Suspended Solids	**3.2**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**SEIMN-20190710**					
Laboratory ID:	07-114-09					
Total Suspended Solids	**10**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**SEIMS-20190710**					
Laboratory ID:	07-114-10					
Total Suspended Solids	**12**	2.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**TOSMI-20190710**					
Laboratory ID:	07-114-11					
Total Suspended Solids	**12**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**TOSMO-20190710**					
Laboratory ID:	07-114-12					
Total Suspended Solids	**9.4**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**TYLMI-20190710**					
Laboratory ID:	07-114-13					
Total Suspended Solids	**4.2**	1.0	SM 2540D	7-12-19	7-12-19	
Client ID:	**TYLMO-20190710**					
Laboratory ID:	07-114-14					
Total Suspended Solids	**9.6**	1.0	SM 2540D	7-12-19	7-12-19	

Date of Report: August 14, 2019
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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA69-20190710**					
Laboratory ID:	07-114-15					
Total Suspended Solids	**6.6**	1.0	SM 2540D	7-12-19	7-12-19	

Date of Report: August 14, 2019
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TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0711W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	7-12-19	7-12-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-114-02								
	ORIG	DUP							
Total Suspended Solids	**39.4**	**40.2**	NA	NA	NA	NA	2	23	
SPIKE BLANK									
Laboratory ID:	SB0711W1								
	SB		SB		SB				
Total Suspended Solids	**90.0**		100	NA	90	69-122	NA	NA	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190710**					
Laboratory ID:	07-114-01					
Turbidity	**3.7**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**COUMI-20190710**					
Laboratory ID:	07-114-02					
Turbidity	**32**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**COUMO-20190710**					
Laboratory ID:	07-114-03					
Turbidity	**24**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**EVAMS-20190710**					
Laboratory ID:	07-114-04					
Turbidity	**5.8**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**EVALSS-20190710**					
Laboratory ID:	07-114-05					
Turbidity	**5.1**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**MONMN-20190710**					
Laboratory ID:	07-114-06					
Turbidity	**16**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**MONMS-20190710**					
Laboratory ID:	07-114-07					
Turbidity	**3.3**	0.10	EPA 180.1	7-11-19	7-11-19	

Date of Report: August 14, 2019
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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190710**					
Laboratory ID:	07-114-08					
Turbidity	**2.2**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**SEIMN-20190710**					
Laboratory ID:	07-114-09					
Turbidity	**6.3**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**SEIMS-20190710**					
Laboratory ID:	07-114-10					
Turbidity	**5.8**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**TOSMI-20190710**					
Laboratory ID:	07-114-11					
Turbidity	**5.1**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**TOSMO-20190710**					
Laboratory ID:	07-114-12					
Turbidity	**4.8**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**TYLMI-20190710**					
Laboratory ID:	07-114-13					
Turbidity	**2.7**	0.10	EPA 180.1	7-11-19	7-11-19	
Client ID:	**TYLMO-20190710**					
Laboratory ID:	07-114-14					
Turbidity	**3.6**	0.10	EPA 180.1	7-11-19	7-11-19	

Date of Report: August 14, 2019
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Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA69-20190710**					
Laboratory ID:	07-114-15					
Turbidity	**4.3**	0.10	EPA 180.1	7-11-19	7-11-19	

Date of Report: August 14, 2019
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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0711W1					
Turbidity	**ND**	0.10	EPA 180.1	7-11-19	7-11-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-114-10								
	ORIG	DUP							
Turbidity	**5.84**	**6.18**	NA	NA	NA	NA	6	15	

Date of Report: August 14, 2019
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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190710**					
Laboratory ID:	07-114-01					
Hardness	**18**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**COUMI-20190710**					
Laboratory ID:	07-114-02					
Hardness	**140**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12&16-19	
Client ID:	**COUMO-20190710**					
Laboratory ID:	07-114-03					
Hardness	**84**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**EVAMS-20190710**					
Laboratory ID:	07-114-04					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**EVALSS-20190710**					
Laboratory ID:	07-114-05					
Hardness	**87**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**MONMN-20190710**					
Laboratory ID:	07-114-06					
Hardness	**100**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**MONMS-20190710**					
Laboratory ID:	07-114-07					
Hardness	**150**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12&16-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190710**					
Laboratory ID:	07-114-08					
Hardness	**100**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**SEIMN-20190710**					
Laboratory ID:	07-114-09					
Hardness	**45**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**SEIMS-20190710**					
Laboratory ID:	07-114-10					
Hardness	**56**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**TOSMI-20190710**					
Laboratory ID:	07-114-11					
Hardness	**73**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**TOSMO-20190710**					
Laboratory ID:	07-114-12					
Hardness	**96**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**TYLMI-20190710**					
Laboratory ID:	07-114-13					
Hardness	**91**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	
Client ID:	**TYLMO-20190710**					
Laboratory ID:	07-114-14					
Hardness	**80**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA69-20190710**					
Laboratory ID:	07-114-15					
Hardness	**99**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0712WH4					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	7-12-19	7-12-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-114-14										
	ORIG	DUP									
Hardness	**80.0**	**83.7**	NA		NA	NA		NA	5	20	
MATRIX SPIKES											
Laboratory ID:	07-114-14										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**220**	**218**	132	132	80.0	106	105	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0712WH4										
	SB		SB			SB					
Hardness	**128**		132		NA	97		85-115	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190710**					
Laboratory ID:	07-114-01					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**COUMI-20190710**					
Laboratory ID:	07-114-02					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**COUMO-20190710**					
Laboratory ID:	07-114-03					
Dissolved Organic Carbon	**14**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**EVAMS-20190710**					
Laboratory ID:	07-114-04					
Dissolved Organic Carbon	**3.1**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**EVALSS-20190710**					
Laboratory ID:	07-114-05					
Dissolved Organic Carbon	**2.4**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**MONMN-20190710**					
Laboratory ID:	07-114-06					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**MONMS-20190710**					
Laboratory ID:	07-114-07					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	7-17-19	7-17-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190710**					
Laboratory ID:	07-114-08					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**SEIMN-20190710**					
Laboratory ID:	07-114-09					
Dissolved Organic Carbon	**2.1**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**SEIMS-20190710**					
Laboratory ID:	07-114-10					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**TOSMI-20190710**					
Laboratory ID:	07-114-11					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**TOSMO-20190710**					
Laboratory ID:	07-114-12					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**TYLMI-20190710**					
Laboratory ID:	07-114-13					
Dissolved Organic Carbon	**3.5**	1.0	SM 5310B	7-17-19	7-17-19	
Client ID:	**TYLMO-20190710**					
Laboratory ID:	07-114-14					
Dissolved Organic Carbon	**5.2**	1.0	SM 5310B	7-17-19	7-17-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA69-20190710**					
Laboratory ID:	07-114-15					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	7-17-19	7-17-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0717D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	7-17-19	7-17-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-114-01								
	ORIG	DUP							
Dissolved Organic Carbon	**13.4**	**14.2**	NA	NA	NA	NA	6	15	
MATRIX SPIKE									
Laboratory ID:	07-114-01								
	MS		MS		MS				
Dissolved Organic Carbon	**22.2**		10.0	13.4	88	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0717D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.79**		10.0	NA	98	87-122	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190710**					
Laboratory ID:	07-114-01					
Total Phosphorus	**0.036**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**COUMI-20190710**					
Laboratory ID:	07-114-02					
Total Phosphorus	**0.17**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**COUMO-20190710**					
Laboratory ID:	07-114-03					
Total Phosphorus	**0.15**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**EVAMS-20190710**					
Laboratory ID:	07-114-04					
Total Phosphorus	**0.032**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**EVALSS-20190710**					
Laboratory ID:	07-114-05					
Total Phosphorus	**0.042**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**MONMN-20190710**					
Laboratory ID:	07-114-06					
Total Phosphorus	**0.075**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**MONMS-20190710**					
Laboratory ID:	07-114-07					
Total Phosphorus	**0.050**	0.010	EPA 365.1	7-16-19	7-17-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190710**					
Laboratory ID:	07-114-08					
Total Phosphorus	**0.056**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**SEIMN-20190710**					
Laboratory ID:	07-114-09					
Total Phosphorus	**0.14**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**SEIMS-20190710**					
Laboratory ID:	07-114-10					
Total Phosphorus	**0.091**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**TOSMI-20190710**					
Laboratory ID:	07-114-11					
Total Phosphorus	**0.073**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**TOSMO-20190710**					
Laboratory ID:	07-114-12					
Total Phosphorus	**0.080**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**TYLMI-20190710**					
Laboratory ID:	07-114-13					
Total Phosphorus	**0.059**	0.010	EPA 365.1	7-16-19	7-17-19	
Client ID:	**TYLMO-20190710**					
Laboratory ID:	07-114-14					
Total Phosphorus	**0.055**	0.010	EPA 365.1	7-16-19	7-17-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA69-20190710**					
Laboratory ID:	07-114-15					
Total Phosphorus	**0.053**	0.010	EPA 365.1	7-16-19	7-17-19	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0716W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	7-16-19	7-17-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-114-01								
	ORIG	DUP							
Total Phosphorus	**0.0361**	**0.0349**	NA	NA	NA	NA	3	14	
MATRIX SPIKE									
Laboratory ID:	07-114-01								
	MS		MS		MS				
Total Phosphorus	**0.292**		0.250	0.0361	102	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0716W1								
	SB		SB		SB				
Total Phosphorus	**0.228**		0.250	NA	91	78-113	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190710**					
Laboratory ID:	07-114-01					
Copper	**ND**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**ND**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**COUMI-20190710**					
Laboratory ID:	07-114-02					
Copper	**3.6**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**16**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**COUMO-20190710**					
Laboratory ID:	07-114-03					
Copper	**7.2**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**33**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**EVAMS-20190710**					
Laboratory ID:	07-114-04					
Copper	**ND**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**ND**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**EVALSS-20190710**					
Laboratory ID:	07-114-05					
Copper	**1.1**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**5.4**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**MONMN-20190710**					
Laboratory ID:	07-114-06					
Copper	**3.2**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**36**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**MONMS-20190710**					
Laboratory ID:	07-114-07					
Copper	**1.2**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**13**	5.0	EPA 200.8	7-12-19	7-16-19	

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190710**					
Laboratory ID:	07-114-08					
Copper	**1.1**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**12**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**SEIMN-20190710**					
Laboratory ID:	07-114-09					
Copper	**ND**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**ND**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**SEIMS-20190710**					
Laboratory ID:	07-114-10					
Copper	**ND**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**9.0**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**TOSMI-20190710**					
Laboratory ID:	07-114-11					
Copper	**6.9**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**76**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**TOSMO-20190710**					
Laboratory ID:	07-114-12					
Copper	**2.3**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**32**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**TYLMI-20190710**					
Laboratory ID:	07-114-13					
Copper	**4.1**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**14**	5.0	EPA 200.8	7-12-19	7-16-19	
Client ID:	**TYLMO-20190710**					
Laboratory ID:	07-114-14					
Copper	**2.7**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**5.9**	5.0	EPA 200.8	7-12-19	7-16-19	

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA69-20190710**					
Laboratory ID:	07-114-15					
Copper	**1.2**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**7.6**	5.0	EPA 200.8	7-12-19	7-16-19	

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0712WH3					
Copper	**ND**	1.0	EPA 200.8	7-12-19	7-16-19	
Zinc	**ND**	5.0	EPA 200.8	7-12-19	7-16-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-114-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	07-114-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**86.8**	**86.0**	100	100	ND	**87**	**86**	75-125	1	20	
Zinc	**102**	**98.4**	100	100	ND	**102**	**98**	75-125	4	20	

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190710**					
Laboratory ID:	07-114-01					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	
Client ID:	**COUMI-20190710**					
Laboratory ID:	07-114-02					
Copper	**2.0**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	
Client ID:	**COUMO-20190710**					
Laboratory ID:	07-114-03					
Copper	**4.8**	1.0	EPA 200.8		7-16-19	
Zinc	**12**	5.0	EPA 200.8		7-16-19	
Client ID:	**EVAMS-20190710**					
Laboratory ID:	07-114-04					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	
Client ID:	**EVALSS-20190710**					
Laboratory ID:	07-114-05					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	
Client ID:	**MONMN-20190710**					
Laboratory ID:	07-114-06					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**12**	5.0	EPA 200.8		7-16-19	
Client ID:	**MONMS-20190710**					
Laboratory ID:	07-114-07					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190710**					
Laboratory ID:	07-114-08					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**5.2**	5.0	EPA 200.8		7-16-19	
Client ID:	**SEIMN-20190710**					
Laboratory ID:	07-114-09					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	
Client ID:	**SEIMS-20190710**					
Laboratory ID:	07-114-10					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	
Client ID:	**TOSMI-20190710**					
Laboratory ID:	07-114-11					
Copper	**4.9**	1.0	EPA 200.8		7-16-19	
Zinc	**34**	5.0	EPA 200.8		7-16-19	
Client ID:	**TOSMO-20190710**					
Laboratory ID:	07-114-12					
Copper	**1.7**	1.0	EPA 200.8		7-16-19	
Zinc	**11**	5.0	EPA 200.8		7-16-19	
Client ID:	**TYLMI-20190710**					
Laboratory ID:	07-114-13					
Copper	**2.8**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	
Client ID:	**TYLMO-20190710**					
Laboratory ID:	07-114-14					
Copper	**2.7**	1.0	EPA 200.8		7-16-19	
Zinc	**5.2**	5.0	EPA 200.8		7-16-19	

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA69-20190710**					
Laboratory ID:	07-114-15					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	

Date of Report: August 14, 2019
Samples Submitted: July 10, 2019
Laboratory Reference: 1907-114
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0716D1					
Copper	**ND**	1.0	EPA 200.8		7-16-19	
Zinc	**ND**	5.0	EPA 200.8		7-16-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-114-02										
	ORIG	DUP									
Copper	**1.97**	**1.73**	NA	NA		NA		NA	13	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	07-114-02										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**84.4**	**78.0**	80.0	80.0	1.97	**103**	**95**	75-125	8	20	
Zinc	**89.0**	**80.8**	80.0	80.0	ND	**111**	**101**	75-125	10	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Aug 14 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190710	Water	19-A009321	Micro, NUT
COUMI-20190710	Water	19-A009322	Micro, NUT
COUMO-20190710	Water	19-A009323	Micro, NUT
EVAMS-20190710	Water	19-A009324	Micro, NUT
EVALSS-20190710	Water	19-A009325	Micro, NUT
MONMN-20190710	Water	19-A009326	Micro, NUT
MONMS-20190710	Water	19-A009327	Micro, NUT
MONM-20190710	Water	19-A009328	Micro, NUT
SEIMN-20190710	Water	19-A009329	Micro, NUT
SEIMS-20190710	Water	19-A009330	Micro, NUT
TOSMI-20190710	Water	19-A009331	Micro, NUT
TOSMO-20190710	Water	19-A009332	Micro, NUT
TYLMI-20190710	Water	19-A009333	Micro, NUT
TYLMO-20190710	Water	19-A009334	Micro, NUT
QA69-20190710	Water	19-A009335	Micro, NUT

Your samples were received on Thursday, July 11, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

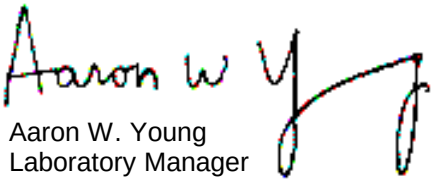
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Aug 14 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 07-114

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 07-114
All results reported on an as received basis.

Date Received: 07/11/19
Date Reported: 8/14/19

AMTEST Identification Number **19-A009321**
Client Identification **COLM-20190710**
Sampling Date **07/10/19, 14:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	62.	CFU/100 ml		2	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	0.69	mg/l		0.1			
Total Nitrogen (TKN)	0.691	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009322**
Client Identification **COUMI-20190710**
Sampling Date **07/10/19, 09:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	400	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	1.08	mg/l		0.1			
Total Nitrogen (TKN)	0.669	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.41	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009323**
Client Identification **COUMO-20190710**
Sampling Date **07/10/19, 09:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1200	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	1.45	mg/l		0.1			
Total Nitrogen (TKN)	0.867	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.58	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009324**
Client Identification **EVAMS-20190710**
Sampling Date **07/10/19, 09:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	640	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	2.61	mg/l		0.1			
Total Nitrogen (TKN)	0.609	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	2.0	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009325**
Client Identification **EVALSS-20190710**
Sampling Date **07/10/19, 10:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	40.	CFU/100 ml		2	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	2.09	mg/l		0.1			
Total Nitrogen (TKN)	0.589	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	1.5	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009326**
Client Identification **MONMN-20190710**
Sampling Date **07/10/19, 16:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	460	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	1.14	mg/l		0.1			
Total Nitrogen (TKN)	0.575	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.57	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009327**
Client Identification **MONMS-20190710**
Sampling Date **07/10/19, 15:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		2	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	0.67	mg/l		0.1			
Total Nitrogen (TKN)	0.547	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009328**
Client Identification **MONM-20190710**
Sampling Date **07/10/19, 15:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	450	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	0.92	mg/l		0.1			
Total Nitrogen (TKN)	0.465	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.46	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009329**
Client Identification **SEIMN-20190710**
Sampling Date **07/10/19, 14:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	630	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.443	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.44	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009330**
Client Identification **SEIMS-20190710**
Sampling Date **07/10/19, 15:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	86.	CFU/100 ml		2	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	2.76	mg/l		0.1			
Total Nitrogen (TKN)	2.35	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.41	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009331**
Client Identification **TOSMI-20190710**
Sampling Date **07/10/19, 08:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	510	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	1.56	mg/l		0.1			
Total Nitrogen (TKN)	0.669	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.89	mg/l		0.02	SM4500NO3	SH	07/15/19

AMTEST Identification Number **19-A009332**
Client Identification **TOSMO-20190710**
Sampling Date **07/10/19, 16:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	630	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	1.05	mg/l		0.1			
Total Nitrogen (TKN)	0.441	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.61	mg/l		0.02	SM4500NO3	SH	07/31/19

AMTEST Identification Number **19-A009333**
Client Identification **TYLMI-20190710**
Sampling Date **07/10/19, 14:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	590	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	2.15	mg/l		0.1			
Total Nitrogen (TKN)	1.05	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	SH	07/31/19

AMTEST Identification Number **19-A009334**
Client Identification **TYLMO-20190710**
Sampling Date **07/10/19, 14:15**

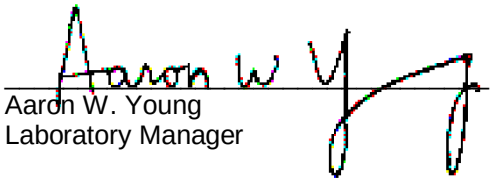
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	640	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	0.89	mg/l		0.1			
Total Nitrogen (TKN)	0.517	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.37	mg/l		0.02	SM4500NO3	SH	07/31/19

AMTEST Identification Number **19-A009335**
Client Identification **QA69-20190710**
Sampling Date **07/10/19, 16:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	380	CFU/100 ml		10	SM 9222D	NG	07/11/19
Total Nitrogen (NOX&TKN)	0.93	mg/l		0.1			
Total Nitrogen (TKN)	0.530	mg/l		0.2	SM4500N	SH	07/22/19
Total Nitrate + Nitrite	0.40	mg/l		0.02	SM4500NO3	SH	07/31/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 19-A009321 to 19-A009335

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A009321	Fecal coliform	CFU/100 ml	62.	50.	21.
19-A009328	Fecal coliform	CFU/100 ml	450	400	12.
19-A009089	Total Nitrogen (TKN)	mg/l	13.0	12.5	3.9
19-A009294	Total Nitrogen (TKN)	mg/l	58.8	56.4	4.2
19-A009326	Total Nitrogen (TKN)	mg/l	0.575	0.573	0.35
19-A009374	Total Nitrogen (TKN)	mg/l	0.837	0.861	2.8
19-A009408	Total Nitrogen (TKN)	mg/l	5.98	6.19	3.5
19-A009109	Total Nitrate + Nitrite	mg/l	0.55	0.57	3.6
19-A009296	Total Nitrate + Nitrite	mg/l	6.5	6.2	4.7
19-A009321	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
19-A009331	Total Nitrate + Nitrite	mg/l	0.89	0.91	2.2
19-A009224	Total Nitrate + Nitrite	mg/l	1.3	1.2	8.0
19-A010056	Total Nitrate + Nitrite	mg/l	5.5	5.2	5.6
19-A009505	Total Nitrate + Nitrite	mg/l	0.099	0.10	1.0
19-A009515	Total Nitrate + Nitrite	mg/l	0.067	0.087	26.
19-A009893	Total Nitrate + Nitrite	mg/l	1.8	1.9	5.4

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A009089	Total Nitrogen (TKN)	mg/l	13.0	32.7	20.0	98.50 %
19-A009294	Total Nitrogen (TKN)	mg/l	58.8	105.	50.0	92.40 %
19-A009326	Total Nitrogen (TKN)	mg/l	0.575	2.50	2.00	96.25 %
19-A009374	Total Nitrogen (TKN)	mg/l	0.837	2.87	2.00	101.65 %
19-A009408	Total Nitrogen (TKN)	mg/l	5.98	15.1	10.0	91.20 %
19-A009109	Total Nitrate + Nitrite	mg/l	0.55	1.7	1.0	115.00 %
19-A009224	Total Nitrate + Nitrite	mg/l	0.14	1.2	1.0	106.00 %
19-A009296	Total Nitrate + Nitrite	mg/l	6.5	18.	10.	115.00 %
19-A009321	Total Nitrate + Nitrite	mg/l	< 0.02	1.2	1.0	120.00 %
19-A009331	Total Nitrate + Nitrite	mg/l	0.89	2.1	1.0	121.00 %
19-A009224	Total Nitrate + Nitrite	mg/l	1.3	2.5	1.0	120.00 %
19-A010056	Total Nitrate + Nitrite	mg/l	5.5	23.	20.	87.50 %
19-A009505	Total Nitrate + Nitrite	mg/l	0.099	1.1	1.0	100.10 %
19-A009515	Total Nitrate + Nitrite	mg/l	0.067	1.1	1.0	103.30 %
19-A009893	Total Nitrate + Nitrite	mg/l	1.8	2.5	1.0	70.00 %

QC Summary for sample numbers: 19-A009321 to 19-A009335...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.969	96.9 %
Total Nitrogen (TKN)	mg/l	1.00	0.961	96.1 %
Total Nitrate + Nitrite	mg/l	1.0	1.1	110. %
Total Nitrate + Nitrite	mg/l	1.0	1.1	110. %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 383-3881

Laboratory Reference #: 07-114

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20190710 9321	7/10/19	14:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20190710 22	7/10/19	9:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190710 23	7/10/19	9:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190710 24	7/10/19	9:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190710 25	7/10/19	10:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190710 26	7/10/19	16:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190710 27	7/10/19	15:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190710 28	7/10/19	15:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190710 29	7/10/19	14:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190710 30	7/10/19	15:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:		OnSite En	7/11/19	8:40	
Received by:		AMTEST T = 8.8	7/11/19	8:40	**EDDs - CSV**
Relinquished by:					**Reporting Limits:**
Received by:					**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:					**Total Nitrogen - .10 mg/L**
Received by:					

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 07-114

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

(Standard)

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190710 9331	7/10/19	8:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190710 32	7/10/19	16:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190710 33	7/10/19	14:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20190710 34	7/10/19	14:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
16	QA69-20190710 35	7/10/19	16:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	7/11/19	8:40	
Received by:	AMTEST T=8.8	7/11/19	8:40	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

__X__ Standard

Laboratory No. 07-114

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0710	7/10/19	1455	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0710		0955	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0710		0915	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0710		0945	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0710		1000	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0710		~~1610~~ 1520	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0710		1550	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0710		~~1545~~ 1540	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0710		1420	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0710		1545	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0710		0855	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0710		~~1635~~ 1630	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0710		1445	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0710		1415	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 69-20190710		1610	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Miller Date 7.10.19 Received by _____ Date 7/10/19

Firm Herrera Time 17:00 Firm OSE Time 1700

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

__X__ Standard

Laboratory No. 07-114

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0710	7/10/19	1455	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0710		0955	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0710		0915	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0710		0945	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0710		1000	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0710		1610	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0710		1550	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0710		1520	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0710		1420	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0710		1545	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0710		0855	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0710		1635	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0710		1445	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0710		1415	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 69-20190710		1610	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Meghan Miller Date 7.10.19 Received by _____ Date 7/10/19

Firm Herrera Time 17:00 Firm OSE Time 1700

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	NM, [redacted]
Meter:	Pro DSS #1 / #2
Date/Time:	7/9/19 2:30 pm
Barometric Pressure Start of Day:	Inches Hg: Time:
Barometric Pressure End of Day:	Inches Hg: 760.1 Time: 7:30

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.6 / 1.8	0		
Conductivity (µS/cm)	1000 / 1000	1,000		
Conductivity (µS/cm)	99.6 / 990	100		
DO % Saturation	99.4 / 102.9	100	23.6 / 23.9	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0 / 1.4	0	23.5 / 24.8	
Conductivity (µS/cm)	73.2 / 90.4	100	23.3 / 24.1	?? no data why so low
DO % Saturation	100.6 / 103.5	100	23.8 / 25.4	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NM

Sample Date: 7.10.19 **Sample Time:** 19:55 PDT: X

Base Flow or Storm Event? (S) **Field Filtered Time:** 15:00 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEMS COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 70

Water Quality Sampling

Sample ID: COLM-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	N4
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	Yellow tanin
Odor:	very slight odor
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leuth **Signature:**

Date Checked: 10/15/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.40

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.5

Specific Conductivity (µs/cm) 54.5

Dissolved Oxygen (mg/L) 6.67

* almost stagnant water

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 07/10/19 **Sample Time:** 955 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1000 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Raining lightly + 58°

Water Quality Sampling

Sample ID: COUM120190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear ish

Color: clear / yellowish

Odor: NA

Sheen: NA

Floatables: yes some hy colovet

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Jump Jamal **Signature:**

Date Checked: 10/15/19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): Too low to read gage... best guess 2.60

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.1

Specific Conductivity (µs/cm) 299.2

Dissolved Oxygen (mg/L) 10.33

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 07/10/19 **Sample Time:** 915 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 920 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 65°

Water Quality Sampling

Sample ID: COUMO-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Turbid

Color: brown

Odor: N/A

Sheen: N/A

Floatables: some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 10/15/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 16.2

Specific Conductivity (µs/cm) 197.4

Dissolved Oxygen (mg/L) 9.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas M. Mullen

Sample Date: 7.10.19 **Sample Time:** 9:45 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 9:50 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 65°

Water Quality Sampling

Sample ID: EVAMS-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: Clear

Odor: none

Sheen: none

Floatables: light foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sabrina Lentz **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.88

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13

Specific Conductivity (µs/cm) 230.5

Dissolved Oxygen (mg/L) 10.3

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas M. Mullen

Sample Date: 7.10.19 **Sample Time:** 1000 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1005 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Rainy 65°

Water Quality Sampling

Sample ID: EVALSS-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Erin Lenton **Signature:**

Date Checked: 8/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.3

Specific Conductivity (µs/cm) 210.1

Dissolved Oxygen (mg/L) 10.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 7-10-19 **Sample Time:** 1520 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1525 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 71°

HERRERA

Water Quality Sampling

Sample ID: MONMN 20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Slightly turbid

Color: brown

Odor: NA

Sheen: NA

Floatables: None

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Tony Leuth **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.10

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 15.8

Specific Conductivity (µs/cm) 222.2

Dissolved Oxygen (mg/L) 8.97

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 07-10-19 **Sample Time:** 1550 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1555 PST

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 71°

Water Quality Sampling

Sample ID: MONMS20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: brownish

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] Lentz **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.87 ft

Reference Point (description): TOP OF PVC

Water Quality Measurments

Temperature (°C) 16.3

Specific Conductivity (µs/cm) 342.2

Dissolved Oxygen (mg/L) 6.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N Maas M. Mullen QA

Sample Date: 7/10/19

Sample Time: 1610 / 1620 PDT: X

Base Flow or ~~Storm Event~~? **Field Filtered Time:** 1615 / 1625 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 70°

Water Quality Sampling

Sample ID: MONM - 20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA09-20190700

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 15

Specific Conductivity (µs/cm) 242.6

Dissolved Oxygen (mg/L) 9.82

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas M. Mullen

Sample Date: 7.10.19 **Sample Time:** 14:20 PDT: X

Base Flow or ~~Storm Event~~? **Field Filtered Time:** 14:25 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 70

Water Quality Sampling

Sample ID: SEIMN-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 10/16/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.74

Reference Point (description): top of bolt on side down

Water Quality Measurments

Temperature (°C) 12.7

Specific Conductivity (µs/cm) 118.3

Dissolved Oxygen (mg/L) 10.34

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas M. Mullen

Sample Date: 7/10/19 **Sample Time:** 1545 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1550 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 70°

Water Quality Sampling

Sample ID: SEIMS-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none none
Odor:	none
Sheen:	none
Floatables:	some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lantz **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.72

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.6

Specific Conductivity (µs/cm) 125.8

Dissolved Oxygen (mg/L) 9.66

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. MAAS M. MULLEN

Sample Date: 7.10.19 **Sample Time:** 8:55 PDT: x PST:

Base Flow or Storm Event? (Storm)

Field Filtered Time: 9:00 (Must filter within 15 minutes of collection)

SITE ID: TOSM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 65°

HERRERA

Water Quality Sampling

Sample ID: TOSM1-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	No
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: none

Sheen: none

Floatables: minor bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 x

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.74

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 15.3

Specific Conductivity (µs/cm) 180.7

Dissolved Oxygen (mg/L) 9.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 7-10-19 **Sample Time:** 1635 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1640 PST

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Misty 71°

Water Quality Sampling

Sample ID: TOSMO20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: BROWN

Odor: NA

Sheen: NO

Floatables: Yes lots

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lentz **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.57

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.8

Specific Conductivity (µs/cm) 234.3

Dissolved Oxygen (mg/L) 10.32

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 07/10/19 **Sample Time:** 1445 PDT:

Base Flow or Storm Event: **Field Filtered Time:** 1450 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy (light) + 71°

Water Quality Sampling

Sample ID: TYLM1-20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: brownish

Odor: NA

Sheen: NA

Floatables: some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Tobyn Lentz **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 54.5 inches

Reference Point (description): TOP DOWN FROM TOP OF D/S CULVERT

Water Quality Measurments

Temperature (°C) 15.5

Specific Conductivity (µs/cm) 226.8

Dissolved Oxygen (mg/L) 9.53

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK

Sample Date: 07/10/19 **Sample Time:** 1915 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1920 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMD

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 71°

Water Quality Sampling

Sample ID: TYLMD20190710

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	light brown
Odor:	NA
Sheen:	NA
Floatables:	some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Brynn Lentz **Signature:**

Date Checked: 10/11/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 35.0" inches

Reference Point (description): Down from Top of Culvert

Water Quality Measurments

Temperature (°C) 15.9

Specific Conductivity (µs/cm) 196.8

Dissolved Oxygen (mg/L) 9.93

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 9/26/19 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 7/10/2019 /All locations, QA69 (MONM) Lab Ref No 1907-114

date 10/11/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	2	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	90	**±20**	2	**≤ 25**	D=3.4	**≤ 25**	OK	NONE; MINOR EXCEEDANCE OF FD DIFFERENCE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	6	**≤ 25**	65	**≤ 25**	OK	FLAG MONM J DUE TO FD EXCEEDANCE
Hardness	OK / SM 2340B	NA	**NA**	2-9	**≤180**	≤1.0 mg/L 1.0 mg/L	106, 105	**±25**	97	**±15**	5, 1	**≤ 20**	1	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	<15	**≤15**	7	**≤28**	≤1.0 mg/L 1.0 mg/L	88	**±25**	98	**±15**	6	**≤ 20**	D=0.5	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	102	**±25**	91	**±20**	D=0.001	**≤ 20**	6	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	5, 7, 11	**≤28**	≤0.1 mg/L 0.1 mg/L	70-120	**±25**	92-110	**±20**	0.4-8, NC, D=0.02, D=0.001	**≤ 20**	D=0.07, D=0.06	**≤ 20**	OK	NONE; MINOR EXCEEDANCE OF MS RECOVERY

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 9/26/19 Page 2 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 7/10/2019 /All locations, QA69 (MONM) Lab Ref No 1907-114

date 10/11/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	6	**≤180**	≤1.0 µg/L 1.0 µg/L	87, 86	**±25**	NR	**±15**	NC, 1	**≤ 20**	D=0.1	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	6	**≤180**	≤5.0 µg/L 5.0 µg/L	102, 98	**±25**	NR	**±15**	NC, 4	**≤ 20**	D=4.4	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<15	**≤15**	6	**≤180**	≤1.0 µg/L 1.0 µg/L	103, 95	**±25**	NR	**±15**	D=0.24	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<15	**≤15**	6	**≤180**	≤5.0 µg/L 5.0 µg/L	111, 101	**±25**	NR	**±15**	NR	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	<1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	21, 12	**≤ 35**	17	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 8, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1909-152

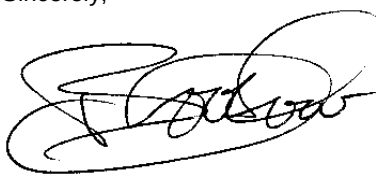
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on September 15, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
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Case Narrative

Samples were collected on September 15, 2019 and received by the laboratory on September 15, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM 20190915**					
Laboratory ID:	09-152-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**COUMO 20190915**					
Laboratory ID:	09-152-02					
Total Suspended Solids	**15**	1.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**COUMI 20190915**					
Laboratory ID:	09-152-03					
Total Suspended Solids	**47**	2.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**TOSMO 20190915**					
Laboratory ID:	09-152-04					
Total Suspended Solids	**32**	2.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**TOSMI 20190915**					
Laboratory ID:	09-152-05					
Total Suspended Solids	**24**	2.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**TYLMO 20190915**					
Laboratory ID:	09-152-06					
Total Suspended Solids	**5.0**	1.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**TYLMI 20190915**					
Laboratory ID:	09-152-07					
Total Suspended Solids	**15**	1.0	SM 2540D	9-16-19	9-17-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS 20190915**					
Laboratory ID:	09-152-08					
Total Suspended Solids	**55**	2.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**EVALSC 20190915**					
Laboratory ID:	09-152-09					
Total Suspended Solids	**84**	2.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**SEIMN 20190915**					
Laboratory ID:	09-152-10					
Total Suspended Solids	**42**	1.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**SEIMS 20190915**					
Laboratory ID:	09-152-11					
Total Suspended Solids	**30**	2.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**MONM 20190915**					
Laboratory ID:	09-152-12					
Total Suspended Solids	**11**	1.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**MONMN 201915**					
Laboratory ID:	09-152-13					
Total Suspended Solids	**16**	1.0	SM 2540D	9-16-19	9-17-19	
Client ID:	**MONMS 20190915**					
Laboratory ID:	09-152-14					
Total Suspended Solids	**2.4**	1.0	SM 2540D	9-16-19	9-17-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA700 201915**					
Laboratory ID:	09-152-15					
Total Suspended Solids	**41**	1.0	SM 2540D	9-16-19	9-17-19	

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TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0916W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-16-19	9-17-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-152-09								
	ORIG	DUP							
Total Suspended Solids	**83.6**	**94.0**	NA	NA	NA	NA	12	23	
SPIKE BLANK									
Laboratory ID:	SB0916W1								
	SB		SB		SB				
Total Suspended Solids	**90.0**		100	NA	90	69-122	NA	NA	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM 20190915**					
Laboratory ID:	09-152-01					
Turbidity	**1.3**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**COUMO 20190915**					
Laboratory ID:	09-152-02					
Turbidity	**11**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**COUMI 20190915**					
Laboratory ID:	09-152-03					
Turbidity	**28**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**TOSMO 20190915**					
Laboratory ID:	09-152-04					
Turbidity	**16**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**TOSMI 20190915**					
Laboratory ID:	09-152-05					
Turbidity	**9.6**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**TYLMO 20190915**					
Laboratory ID:	09-152-06					
Turbidity	**4.5**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**TYLMI 20190915**					
Laboratory ID:	09-152-07					
Turbidity	**4.5**	0.10	EPA 180.1	9-16-19	9-16-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS 20190915**					
Laboratory ID:	09-152-08					
Turbidity	**25**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**EVALSS 20190915**					
Laboratory ID:	09-152-09					
Turbidity	**30**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**SEIMN 20190915**					
Laboratory ID:	09-152-10					
Turbidity	**24**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**SEIMS 20190915**					
Laboratory ID:	09-152-11					
Turbidity	**14**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**MONM 20190915**					
Laboratory ID:	09-152-12					
Turbidity	**8.0**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**MONMN 201915**					
Laboratory ID:	09-152-13					
Turbidity	**10**	0.10	EPA 180.1	9-16-19	9-16-19	
Client ID:	**MONMS 20190915**					
Laboratory ID:	09-152-14					
Turbidity	**2.6**	0.10	EPA 180.1	9-16-19	9-16-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA70 201915**					
Laboratory ID:	09-152-15					
Turbidity	**25**	0.10	EPA 180.1	9-16-19	9-16-19	

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TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0916W1					
Turbidity	**ND**	0.10	EPA 180.1	9-16-19	9-16-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-152-02								
	ORIG	DUP							
Turbidity	**10.8**	**11.0**	NA	NA	NA	NA	2	15	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM 20190915**					
Laboratory ID:	09-152-01					
Hardness	**14**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**COUMO 20190915**					
Laboratory ID:	09-152-02					
Hardness	**53**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**COUMI 20190915**					
Laboratory ID:	09-152-03					
Hardness	**84**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**TOSMO 20190915**					
Laboratory ID:	09-152-04					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**TOSMI 20190915**					
Laboratory ID:	09-152-05					
Hardness	**27**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**TYLMO 20190915**					
Laboratory ID:	09-152-06					
Hardness	**35**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**TYLMI 20190915**					
Laboratory ID:	09-152-07					
Hardness	**29**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS 20190915**					
Laboratory ID:	09-152-08					
Hardness	**84**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**EVALSS 20190915**					
Laboratory ID:	09-152-09					
Hardness	**82**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**SEIMN 20190915**					
Laboratory ID:	09-152-10					
Hardness	**44**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**SEIMS 20190915**					
Laboratory ID:	09-152-11					
Hardness	**49**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**MONM 20190915**					
Laboratory ID:	09-152-12					
Hardness	**64**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**MONMN 201915**					
Laboratory ID:	09-152-13					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	
Client ID:	**MONMS 20190915**					
Laboratory ID:	09-152-14					
Hardness	**87**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	

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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA70 201915**					
Laboratory ID:	09-152-15					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	

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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0918WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	9-18-19	9-18-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-152-01										
	ORIG	DUP									
Hardness	**13.5**	**12.9**	NA		NA	NA		NA	5	20	
MATRIX SPIKES											
Laboratory ID:	09-152-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**148**	**145**	132	132	13.5	102	100	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB0918WH1										
	SB		SB			SB					
Hardness	**130**		132		NA	98		85-115	NA	NA	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM 20190915**					
Laboratory ID:	09-152-01					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**COUMO 20190915**					
Laboratory ID:	09-152-02					
Dissolved Organic Carbon	**7.1**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**COUMI 20190915**					
Laboratory ID:	09-152-03					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**TOSMO 20190915**					
Laboratory ID:	09-152-04					
Dissolved Organic Carbon	**6.4**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**TOSMI 20190915**					
Laboratory ID:	09-152-05					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**TYLMO 20190915**					
Laboratory ID:	09-152-06					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**TYLMI 20190915**					
Laboratory ID:	09-152-07					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	9-19-19	9-19-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS 20190915**					
Laboratory ID:	09-152-08					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**EVALSS 20190915**					
Laboratory ID:	09-152-09					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**SEIMN 20190915**					
Laboratory ID:	09-152-10					
Dissolved Organic Carbon	**7.1**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**SEIMS 20190915**					
Laboratory ID:	09-152-11					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**MONM 20190915**					
Laboratory ID:	09-152-12					
Dissolved Organic Carbon	**8.0**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**MONMN 201915**					
Laboratory ID:	09-152-13					
Dissolved Organic Carbon	**8.1**	1.0	SM 5310B	9-19-19	9-19-19	
Client ID:	**MONMS 20190915**					
Laboratory ID:	09-152-14					
Dissolved Organic Carbon	**7.2**	1.0	SM 5310B	9-19-19	9-19-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA70 201915**					
Laboratory ID:	09-152-15					
Dissolved Organic Carbon	**7.1**	1.0	SM 5310B	9-19-19	9-19-19	

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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0919D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	9-19-19	9-19-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-152-01								
	ORIG	DUP							
Dissolved Organic Carbon	**11.3**	**11.5**	NA	NA	NA	NA	1	15	
MATRIX SPIKE									
Laboratory ID:	09-152-01								
	MS		MS		MS				
Dissolved Organic Carbon	**19.6**		10.0	11.3	83	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0919D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.1**		10.0	NA	101	87-122	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM 20190915**					
Laboratory ID:	09-152-01					
Total Phosphorus	**0.021**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**COUMO 20190915**					
Laboratory ID:	09-152-02					
Total Phosphorus	**0.091**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**COUMI 20190915**					
Laboratory ID:	09-152-03					
Total Phosphorus	**0.18**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**TOSMO 20190915**					
Laboratory ID:	09-152-04					
Total Phosphorus	**0.10**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**TOSMI 20190915**					
Laboratory ID:	09-152-05					
Total Phosphorus	**0.060**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**TYLMO 20190915**					
Laboratory ID:	09-152-06					
Total Phosphorus	**0.046**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**TYLMI 20190915**					
Laboratory ID:	09-152-07					
Total Phosphorus	**0.043**	0.010	EPA 365.1	9-18-19	9-19-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS 20190915**					
Laboratory ID:	09-152-08					
Total Phosphorus	**0.082**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**EVALSS 20190915**					
Laboratory ID:	09-152-09					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**SEIMN 20190915**					
Laboratory ID:	09-152-10					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**SEIMS 20190915**					
Laboratory ID:	09-152-11					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**MONM 20190915**					
Laboratory ID:	09-152-12					
Total Phosphorus	**0.066**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**MONMN 201915**					
Laboratory ID:	09-152-13					
Total Phosphorus	**0.070**	0.010	EPA 365.1	9-18-19	9-19-19	
Client ID:	**MONMS 20190915**					
Laboratory ID:	09-152-14					
Total Phosphorus	**0.042**	0.010	EPA 365.1	9-18-19	9-19-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA70 201915**					
Laboratory ID:	09-152-15					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-18-19	9-19-19	

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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0918W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	9-18-19	9-19-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-163-01								
	ORIG	DUP							
Total Phosphorus	**0.465**	**0.455**	NA	NA	NA	NA	2	14	
MATRIX SPIKE									
Laboratory ID:	09-163-01								
	MS		MS		MS				
Total Phosphorus	**0.698**		0.250	0.465	93	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0918W1								
	SB		SB		SB				
Total Phosphorus	**0.227**		0.250	NA	91	78-113	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM 20190915**					
Laboratory ID:	09-152-01					
Copper	**1.2**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**ND**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**COUMO 20190915**					
Laboratory ID:	09-152-02					
Copper	**4.3**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**60**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**COUMI 20190915**					
Laboratory ID:	09-152-03					
Copper	**5.4**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**33**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**TOSMO 20190915**					
Laboratory ID:	09-152-04					
Copper	**6.4**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**50**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**TOSMI 20190915**					
Laboratory ID:	09-152-05					
Copper	**5.3**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**66**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**TYLMO 20190915**					
Laboratory ID:	09-152-06					
Copper	**5.0**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**15**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**TYLMI 20190915**					
Laboratory ID:	09-152-07					
Copper	**5.2**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**9.0**	5.0	EPA 200.8	9-17-19	9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS 20190915**					
Laboratory ID:	09-152-08					
Copper	**2.1**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**8.2**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**EVALSS 20190915**					
Laboratory ID:	09-152-09					
Copper	**3.2**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**11**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**SEIMN 20190915**					
Laboratory ID:	09-152-10					
Copper	**2.6**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**6.3**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**SEIMS 20190915**					
Laboratory ID:	09-152-11					
Copper	**2.0**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**6.8**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**MONM 20190915**					
Laboratory ID:	09-152-12					
Copper	**2.7**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**23**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**MONMN 201915**					
Laboratory ID:	09-152-13					
Copper	**2.0**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**10**	5.0	EPA 200.8	9-17-19	9-17-19	
Client ID:	**MONMS 20190915**					
Laboratory ID:	09-152-14					
Copper	**1.8**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**ND**	5.0	EPA 200.8	9-17-19	9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA70 201915**					
Laboratory ID:	09-152-15					
Copper	**2.1**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**5.5**	5.0	EPA 200.8	9-17-19	9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917WH2					
Copper	**ND**	1.0	EPA 200.8	9-17-19	9-17-19	
Zinc	**ND**	5.0	EPA 200.8	9-17-19	9-17-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-152-04										
	ORIG	DUP									
Copper	**6.36**	**5.98**	NA	NA		NA		NA	6	20	
Zinc	**49.8**	**46.4**	NA	NA		NA		NA	7	20	
MATRIX SPIKES											
Laboratory ID:	09-152-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**95.8**	**96.4**	100	100	6.36	**89**	**90**	75-125	1	20	
Zinc	**156**	**161**	100	100	49.8	**106**	**111**	75-125	3	20	

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM 20190915**					
Laboratory ID:	09-152-01					
Copper	**ND**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	
Client ID:	**COUMO 20190915**					
Laboratory ID:	09-152-02					
Copper	**3.1**	1.0	EPA 200.8		9-17-19	
Zinc	**57**	5.0	EPA 200.8		9-17-19	
Client ID:	**COUMI 20190915**					
Laboratory ID:	09-152-03					
Copper	**3.1**	1.0	EPA 200.8		9-17-19	
Zinc	**14**	5.0	EPA 200.8		9-17-19	
Client ID:	**TOSMO 20190915**					
Laboratory ID:	09-152-04					
Copper	**2.9**	1.0	EPA 200.8		9-17-19	
Zinc	**16**	5.0	EPA 200.8		9-17-19	
Client ID:	**TOSMI 20190915**					
Laboratory ID:	09-152-05					
Copper	**3.8**	1.0	EPA 200.8		9-17-19	
Zinc	**48**	5.0	EPA 200.8		9-17-19	
Client ID:	**TYLMO 20190915**					
Laboratory ID:	09-152-06					
Copper	**3.9**	1.0	EPA 200.8		9-17-19	
Zinc	**10**	5.0	EPA 200.8		9-17-19	
Client ID:	**TYLMI 20190915**					
Laboratory ID:	09-152-07					
Copper	**4.4**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS 20190915**					
Laboratory ID:	09-152-08					
Copper	**ND**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	
Client ID:	**EVALSS 20190915**					
Laboratory ID:	09-152-09					
Copper	**1.1**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	
Client ID:	**SEIMN 20190915**					
Laboratory ID:	09-152-10					
Copper	**ND**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	
Client ID:	**SEIMS 20190915**					
Laboratory ID:	09-152-11					
Copper	**ND**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	
Client ID:	**MONM 20190915**					
Laboratory ID:	09-152-12					
Copper	**1.6**	1.0	EPA 200.8		9-17-19	
Zinc	**17**	5.0	EPA 200.8		9-17-19	
Client ID:	**MONMN 201915**					
Laboratory ID:	09-152-13					
Copper	**1.6**	1.0	EPA 200.8		9-17-19	
Zinc	**6.3**	5.0	EPA 200.8		9-17-19	
Client ID:	**MONMS 20190915**					
Laboratory ID:	09-152-14					
Copper	**1.8**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA70 201915**					
Laboratory ID:	09-152-15					
Copper	**1.0**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 15, 2019
Laboratory Reference: 1909-152
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917D1					
Copper	**ND**	1.0	EPA 200.8		9-17-19	
Zinc	**ND**	5.0	EPA 200.8		9-17-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-152-15										
	ORIG	DUP									
Copper	**1.02**	**1.03**	NA	NA		NA		NA	0	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	09-152-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**73.4**	**74.0**	80.0	80.0	1.02	**91**	**91**	75-125	1	20	
Zinc	**85.0**	**86.6**	80.0	80.0	ND	**106**	**108**	75-125	2	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 4 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190915	Water	19-A015100	Micro, NUT
COUMO-20190915	Water	19-A015101	Micro, NUT
COUMI-20190915	Water	19-A015102	Micro, NUT
TOSMO-20190915	Water	19-A015103	Micro, NUT
TOSMI-20190915	Water	19-A015104	Micro, NUT
TYLMO-20190915	Water	19-A015105	Micro, NUT
TYLMI-20190915	Water	19-A015106	Micro, NUT
EVAMS-20190915	Water	19-A015107	Micro, NUT
EVALSS-20190915	Water	19-A015108	Micro, NUT
SEIMS-20190915	Water	19-A015109	Micro, NUT
SEIMS-20190915	Water	19-A015110	Micro, NUT
MONM-20190915	Water	19-A015111	Micro, NUT
MONMN-20190915	Water	19-A015112	Micro, NUT
MONMS-20190915	Water	19-A015113	Micro, NUT
QA70-20190915	Water	19-A015114	Micro, NUT

Your samples were received on Monday, September 16, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 4 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 09-152

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 09-152
All results reported on an as received basis.

Date Received: 09/16/19
Date Reported: 10/ 4/19

AMTEST Identification Number **19-A015100**
Client Identification **COLM-20190915**
Sampling Date **09/15/19, 07:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.72	mg/l		0.1			
Total Nitrogen (TKN)	0.637	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.080	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015101**
Client Identification **COUMO-20190915**
Sampling Date **09/15/19, 05:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4300	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.617	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.33	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015102**
Client Identification **COUMI-20190915**
Sampling Date **09/15/19, 05:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2300	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	1.53	mg/l		0.1			
Total Nitrogen (TKN)	1.24	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015103**
Client Identification **TOSMO-20190915**
Sampling Date **09/15/19, 05:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1000	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	1.02	mg/l		0.1			
Total Nitrogen (TKN)	0.726	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015104**
Client Identification **TOSMI-20190915**
Sampling Date **09/15/19, 05:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2600	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.79	mg/l		0.1			
Total Nitrogen (TKN)	0.523	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015105**
Client Identification **TYLMO-20190915**
Sampling Date **09/15/19, 06:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	800	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.67	mg/l		0.1			
Total Nitrogen (TKN)	0.463	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.21	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015106**
Client Identification **TYLMI-20190915**
Sampling Date **09/15/19, 06:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	540	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.72	mg/l		0.1			
Total Nitrogen (TKN)	0.541	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.18	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015107**
Client Identification **EVAMS-20190915**
Sampling Date **09/15/19, 05:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2000	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	2.66	mg/l		0.1			
Total Nitrogen (TKN)	1.56	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015108**
Client Identification **EVALSS-20190915**
Sampling Date **09/15/19, 05:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	2.36	mg/l		0.1			
Total Nitrogen (TKN)	1.44	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.92	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015109**
Client Identification **SEIMS-20190915**
Sampling Date **09/15/19, 06:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	880	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.583	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.22	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015110**
Client Identification **SEIMS-20190915**
Sampling Date **09/15/19, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	1.25	mg/l		0.1			
Total Nitrogen (TKN)	1.01	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015111**
Client Identification **MONM-20190915**
Sampling Date **09/15/19, 07:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	520	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.83	mg/l		0.1			
Total Nitrogen (TKN)	0.689	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015112**
Client Identification **MONMN-20190915**
Sampling Date **09/15/19, 06:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	500	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.83	mg/l		0.1			
Total Nitrogen (TKN)	0.731	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.096	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015113**
Client Identification **MONMS-20190915**
Sampling Date **09/15/19, 06:55**

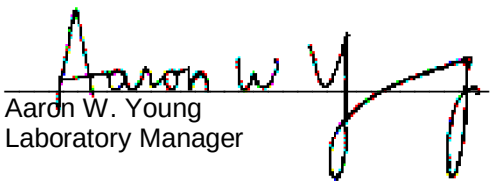
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	620	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.55	mg/l		0.1			
Total Nitrogen (TKN)	0.461	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.092	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015114**
Client Identification **QA70-20190915**
Sampling Date **09/15/19, 06:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	260	CFU/100 ml		1	SM 9222D	AG	09/16/19
Total Nitrogen (NOX&TKN)	0.78	mg/l		0.1			
Total Nitrogen (TKN)	0.640	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	SH	09/20/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 19-A015100 to 19-A015114

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A015100	Fecal coliform	CFU/100 ml	140	76.	59.
19-A015113	Fecal coliform	CFU/100 ml	620	700	12.
19-A015126	Fecal coliform	CFU/100 ml	240	250	4.1
19-A015096	Total Nitrogen (TKN)	mg/l	0.238	0.287	19.
19-A015107	Total Nitrogen (TKN)	mg/l	1.56	1.54	1.3
19-A015140	Total Nitrogen (TKN)	mg/l	42.3	42.9	1.4
19-A015171	Total Nitrogen (TKN)	mg/l	0.572	0.599	4.6
19-A015200	Total Nitrogen (TKN)	mg/l	0.686	0.684	0.29
19-A015210	Total Nitrogen (TKN)	mg/l	0.471	0.504	6.8
19-A015244	Total Nitrogen (TKN)	mg/l	1.21	1.20	0.83
19-A014744	Total Nitrate + Nitrite	mg/l	3.6	3.4	5.7
19-A014833	Total Nitrate + Nitrite	mg/l	0.072	0.084	15.
19-A014980	Total Nitrate + Nitrite	mg/l	1.6	1.5	6.5
19-A015091	Total Nitrate + Nitrite	mg/l	0.12	0.11	8.7
19-A015103	Total Nitrate + Nitrite	mg/l	0.29	0.24	19.
19-A015113	Total Nitrate + Nitrite	mg/l	0.092	0.10	8.3
19-A015163	Total Nitrate + Nitrite	mg/l	1.4	1.6	13.
19-A015173	Total Nitrate + Nitrite	mg/l	0.16	0.16	0.00
19-A015184	Total Nitrate + Nitrite	mg/l	0.22	0.20	9.5

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A015096	Total Nitrogen (TKN)	mg/l	0.238	2.33	2.00	104.60 %
19-A015107	Total Nitrogen (TKN)	mg/l	1.56	3.62	2.00	103.00 %
19-A015140	Total Nitrogen (TKN)	mg/l	42.3	64.7	20.0	112.00 %
19-A015171	Total Nitrogen (TKN)	mg/l	0.572	2.72	2.00	107.40 %
19-A015200	Total Nitrogen (TKN)	mg/l	0.686	2.84	2.00	107.70 %
19-A015210	Total Nitrogen (TKN)	mg/l	0.471	2.69	2.00	110.95 %
19-A015244	Total Nitrogen (TKN)	mg/l	1.21	3.34	2.00	106.50 %
19-A014744	Total Nitrate + Nitrite	mg/l	3.6	14.	10.	104.00 %
19-A014833	Total Nitrate + Nitrite	mg/l	0.072	1.1	1.0	102.80 %
19-A014980	Total Nitrate + Nitrite	mg/l	1.6	2.5	1.0	90.00 %
19-A015091	Total Nitrate + Nitrite	mg/l	0.12	1.1	1.0	98.00 %
19-A015103	Total Nitrate + Nitrite	mg/l	0.29	1.3	1.0	101.00 %
19-A015113	Total Nitrate + Nitrite	mg/l	0.092	1.0	1.0	90.80 %
19-A015163	Total Nitrate + Nitrite	mg/l	1.4	2.3	1.0	90.00 %
19-A015173	Total Nitrate + Nitrite	mg/l	0.16	1.1	1.0	94.00 %
19-A015184	Total Nitrate + Nitrite	mg/l	0.22	1.0	1.0	78.00 %

QC Summary for sample numbers: 19-A015100 to 19-A015114...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	1.07	107. %
Total Nitrogen (TKN)	mg/l	1.00	1.09	109. %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.96	96.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	0.025
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-152

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20190915 15100	9/15/19	7:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMO-20190915 01	9/15/19	5:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMI-20190915 02	9/15/19	5:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	TOSMO-20190915 03	9/15/19	5:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	TOSMI-20190915 04	9/15/19	5:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	TYLMO-20190915 05	9/15/19	6:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	TYLMI-20190915 06	9/15/19	6:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	EVAMS-20190915 07	9/15/19	5:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	EVALSS-20190915 08	9/15/19	5:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190915 09	9/15/19	6:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	9/16/19	810	
Received by:	AmTest	9/16/19	810	EDDs - CSV
Relinquished by:				Reporting Limits:
Received by:				Fecal Coliform - 1.0 cfu/100ml
Relinquished by:				Total Nitrogen - .10 mg/L
Received by:				

T=12.5

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-152

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	SEIMS-20190915 1510	9/15/19	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	MONM-20190915 11	9/15/19	7:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	MONMN-20190915 12	9/15/19	6:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	MONMS-20190915 13	9/15/19	6:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
16	QA70-20190915 14	9/15/19	6:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite E	9/16/19	810	EDDs - CSV
Received by:	AmTest	9/16/19	810	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

09-152

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

Chain of Custody Record

Project Name:	Project Number:	Client:
Redmond Paired Watershed Taylor ~~Creek Flow and Sediment~~ Monitoring	14-05806-000 ~~17-06530-005~~	Herrera Environmental
Report To: Dylan ~~Ahearn~~ / ~~Jennifer Arthur~~ George Iftner		Page: 1/1
Sampled By: ~~Gretchen Kayser~~ / Kyle Bliss Nina Mags, Valerie Wu, Meghan Moika		Delivery Method: Ice coolers
Laboratory: Analytical Resources Inc.	Requested Completion Date: Standard	Total No. of Containers: ~~210~~ 210

Lab Use:

Analyses Requested

	Sample ID	Date	Time	Sample Type (see codes)	Sample Method (see codes)	Matrix (see codes)	~~Suspended Sediment Concentration SM D3977-97B~~ Total Suspended Solids (SM 2540D)	Turbidity (181.1)	Hardness (EPA 200.7/SM 2340B)	Dissolved organic carbon (5310B*)	Fecal coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N/C)	Total Cu/Zn (EPA 200.8)	Dissolved Cu/Zn (EPA 200.8)**			
1	~~TC-WF~~ COLM 2019 0915	091519	715	PES water	GRB-A	SW	X	X	X	X	X	X	X	X	X			
2	TC-WF COUMO 2019 0915		505	PES water	GRB-A	SW	X	X										
3	TC-WF COUMI 2019 0915		520	PES water	GRB-A	SW	X											
4	~~TC-WF~~ TOSMO 2019 0915		540	PES water	GRB-A	SW	X											
5	~~TC-EF~~ TOSMI 2019 0915		510	PES water	GRB-A	SW	X											
6	~~TC-EF~~ TYLMO 2019 0915		605	PES water	GRB-A	SW	X											
7	~~TC-EF~~ TYLMI 2019 0915		620	PES water	GRB-A	SW	X											
8	~~TC-EF~~ EVAMS 2019 0915		535	PES water	GRB-A	SW	X											
9	~~TC-MS~~ EVALSC 2019 0915		550	PES water	GRB-A	SW	X											
10	~~TC-MS~~ SEIMN 2019 0915		635	PES water	GRB-A	SW	X											
11	~~TC-MS~~ SEIMS 2019 0915		730	PES water	GRB-A	SW	X											
12	~~TC-MS~~ MONM 20190915		740	PES water	GRB-A	SW	X											
13	Comments/Special Instructions: MONMN 2019 0915		640	water														
14	MONMS 2019 0915		655	water														

Relinquished by (Name/CO/	Signature	Date/Time	Received By (Name/CO)	Signature	Date/Time
Meghan Moika / Herrera		9.15.19 8:30	Blair Goodman		9/15/19 830
Relinquished by (Name/CO/	Signature	Date/Time	Received By (Name/CO)	Signature	Date/Time

Sample Type: PES= Primary Environmental Sample C=Composite Sample Method: GRB-A= Grab Automatic **Matrix Codes:** GW=Groundwater SE=Sediment SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

15 QA 20190915 2019 0915 635 water

* field filtered 0.45 µm filtered within 15 minutes of collection

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

Chain of Custody Record

09-152

Project Name: Redmond Paired Watershed Taylor ~~Creek Flow and Sediment M~~Monitoring	Project Number: 19-05806-000 ~~17-06520-005~~
Client: Herrera Environmental	
Report To: ~~Dylan Ahearn / Jennifer Arthur~~ George Iftner	Page: 1/1
Sampled By: ~~Gretchen Kayser~~ / Kyle Bliss Nina Mags, Valerie Wu, Meghan Mulka	Delivery Method: Ice Coolers
Laboratory: Analytical Resources Inc.	Requested Completion Date: Standard
Total No. of Containers: 210	
Lab Use:	

Analyses Requested

	Sample ID	Date	Time	Sample Type (see codes)	Sample Method (see codes)	Matrix (see codes)	~~Suspended Sediment Concentration~~ ~~SM~~ Total Suspended Solids (SM 2540D)	Turbidity (181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved organic carbon (SM 5310B*)	Fecal coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N/B)	Total Cu/Zn (EPA 200.8)	Dissolved Cu/Zn (EPA 200.8)*			
1	~~TC-WF~~ COLM 2019 0915	091519	715	PES water	GRB-A	~~SW~~	X	X	X	X	X	X	X	X	X			
2	TC-WF COUMO 2019 0915		505	PES water	GRB-A	SW	X	X										
3	TC-WF COUMI 2019 0915		520	PES water	GRB-A	~~SW~~	X											
4	~~TC-WF~~ TOSMO 2019 0915		540	PES water	GRB-A	~~SW~~	X											
5	~~TC-EF~~ TOSMI 2019 0915		510	PES water	GRB-A	~~SW~~	X											
6	~~TC-EF~~ TYLMO 2019 0915		605	PES water	GRB-A	~~SW~~	X											
7	~~TC-EF~~ TYLMI 2019 0915		620	PES water	GRB-A	~~SW~~	X											
8	~~TC-EF~~ EVAMS 2019 0915		535	PES water	GRB-A	~~SW~~	X											
9	~~TC-MS~~ EVALSC 2019 0915		550	PES water	GRB-A	~~SW~~	X											
10	~~TC-MS~~ SEIMN 2019 0915		635	PES water	GRB-A	~~SW~~	X											
11	~~TC-MS~~ SEIMS 2019 0915		730	PES water	GRB-A	~~SW~~	X											
12	TC-MS MONM 20190915		740	PES water	GRB-A	~~SW~~	X											
13	Comments/Special Instructions: MONMN 2019 0915		640	water														
14	MONMS 2019 0915	↓	655	water														

Relinquished by (Name/CO/	Signature	Date/Time	Received By (Name/CO)	Signature	Date/Time
Meghan Mulka / Herrera		9.15.19 8:30	Blair Goodman		9/15/19 830
Relinquished by (Name/CO/	Signature	Date/Time	Received By (Name/CO)	Signature	Date/Time

Sample Type: PES= Primary Environmental Sample C=Composite **Sample Method:** GRB-A= Grab Automatic **Matrix Codes:** GW=Groundwater SE=Sediment SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

15 QA 710 2019 0915 2019 0915 635 water

* field filtered 0.45 µm filtered within

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Mullen
Meter:	YSI ProDSS #2
Date/Time:	9.13.19 / 8:17
Barometric Pressure Start of Day:	mmHg: 767.6 Time: 8:20
Barometric Pressure End of Day:	mmHg: 760.9 Time: 8:00 / 9.18.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.2	0	24.1	Herrera DI water
Conductivity (µS/cm)	1001	1,000	24.1	
Conductivity (µS/cm)	101.4	100	24.1	
DO % Saturation	101	100	23.8	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.5	0	24.1	Herrera DI water
Conductivity (µS/cm)	98.5	100	23.6	
DO % Saturation	100.3	100	23.3	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/15/19 **Sample Time:** 0710 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0715 PST:

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F, Rainy

Water Quality Sampling

Sample ID: COLM-20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	slight brown tint
Odor:	NO
Sheen:	NO
Floatables:	NO

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: L Lentz **Signature:**

Date Checked: 12-27-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.46

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.8

Specific Conductivity (µs/cm) 44.3

Dissolved Oxygen (mg/L) 7.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9-15-19 **Sample Time:** 5:20 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 5:20 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F + Rain

Water Quality Sampling

Sample ID: COUM120190905

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: light brown

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E. Leith **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.65

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 14.6

Specific Conductivity (µs/cm) 201.2

Dissolved Oxygen (mg/L) 9.83

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9.15.19 **Sample Time:** 5:05 PDT: X

Base Flow or Storm Event? (Storm Event) **Field Filtered Time:** 5:05 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F + Rain

Water Quality Sampling

Sample ID: COUMO20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: light turbidity

Color: light brown

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.45

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 15.9

Specific Conductivity (µs/cm) 124.8

Dissolved Oxygen (mg/L) 9.44

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/15/19 **Sample Time:** 0530 PDT

Base Flow or Storm Event? **Field Filtered Time:** 0535 PST

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F, Rainy

Water Quality Sampling

Sample ID: EVAMS-20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	light brown
Odor:	NO
Sheen:	NO
Floatables:	some bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S Lowell **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 x

MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.95

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.1

Specific Conductivity (µs/cm) 180.0

Dissolved Oxygen (mg/L) 10.0

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/15/19 **Sample Time:** 0545 PDT

Base Flow or Storm Event? **Field Filtered Time:** 0550 PST

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F, Rainy

Water Quality Sampling

Sample ID: EVALSS-20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	turbid
Color:	light brown
Odor:	No
Sheen:	NO
Floatables:	NO

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E. Louth **Signature:**

Date Checked: 11-27-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 x

MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.42

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14

Specific Conductivity (µs/cm) 175.5

Dissolved Oxygen (mg/L) 10.21

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9-15-19 **Sample Time:** 6:40 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 6:40 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F + & rain

Water Quality Sampling

Sample ID: MONMN20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: no

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Leuth **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.25

Reference Point (description): staff gauge

Water Quality Measurments

Temperature (°C) 15.5

Specific Conductivity (µs/cm) 136.5

Dissolved Oxygen (mg/L) 9.45

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9.15.19 **Sample Time:** 6:55 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 6:55 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F

Water Quality Sampling

Sample ID: MONMS 20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: no

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: C. Leuth **Signature:**

Date Checked: 11.22.19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.56

Reference Point (description): dropline @ top of pipe down

Water Quality Measurments

Temperature (°C) 15.0

Specific Conductivity (µs/cm) 202.9

Dissolved Oxygen (mg/L) 6.28

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/15/19 **Sample Time:** 0735 PDT

Base Flow or Storm Event? **Field Filtered Time:** 0740 PST

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F, Rainy

Water Quality Sampling

Sample ID: MONM-20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: Slight brown tint

Odor: NO

Sheen: NO

Floatables: NO

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Louth **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

~~YSI Pro DSS 2~~

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A MM 10.18.19

Reference Point (description): N/A

Water Quality Measurments

Temperature (°C) 15.9

Specific Conductivity (µs/cm) 152.6

Dissolved Oxygen (mg/L) 9.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/15/19 **Sample Time:** 0630 PDT

Base Flow or Storm Event? **Field Filtered Time:** 0635 PST

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F, Rainy

Water Quality Sampling

Sample ID: SEIMN0 - 20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	Yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	QA 70 - 20190915
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	light brown
Odor:	NO
Sheen:	NO
Floatables:	NO

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 x

MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 8 3/8 in = 0.70 ft

MM 10.18.19

Reference Point (description): top of bolt

Water Quality Measurments

Temperature (°C) 13.2

Specific Conductivity (µs/cm) 103.8

Dissolved Oxygen (mg/L) 10.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9.15.19 **Sample Time:** 7:30 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 7:30 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F + Rain

Water Quality Sampling

Sample ID: SEIMS20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	tannin
Odor:	no
Sheen:	no
Floatables:	~~no~~ foam @ weirs

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E. Leuth **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.81

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 13.3

Specific Conductivity (µs/cm) 104.5

Dissolved Oxygen (mg/L) 9.45

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/15/19 **Sample Time:** 0510 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0510 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSHM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60°F Rainy

Water Quality Sampling

Sample ID: TOSHM1-20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	slightly turbid
Color:	clear
Odor:	NO
Sheen:	NO
Floatables:	slight bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Louth **Signature:**

Date Checked: 11-27-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 x MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

Reference Point (description):

Water Quality Measurments

Temperature (°C) 16.5

Specific Conductivity (µs/cm) 66.5

Dissolved Oxygen (mg/L) 9.58

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9.15.19 **Sample Time:** 5:40 PDT: X

Base Flow or Storm Event? (Storm Event) **Field Filtered Time:** 5:40 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60°F + rain

Water Quality Sampling

Sample ID: TOSMO20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	light brown
Odor:	no
Sheen:	no
Floatables:	foam below water weir

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E. Lantz **Signature:**

Date Checked: 10-22-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.73

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 15.1

Specific Conductivity (µs/cm) 98.1

Dissolved Oxygen (mg/L) 9.95

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9.15.19 **Sample Time:** 6:20 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 6:20 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F + ~~Rain~~ Sprinkling

Water Quality Sampling

Sample ID: TYLM1 20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: no

Odor: biological odor

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T Reuter **Signature:**

Date Checked: 10-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.50

Reference Point (description): top of culvert to WS

Water Quality Measurments

Temperature (°C) 15.7

Specific Conductivity (µs/cm) 725

Dissolved Oxygen (mg/L) 9.04

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 9-15-19 **Sample Time:** 6:05 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 6:05 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F + sprinkling rain

Water Quality Sampling

Sample ID: TYLMO 20190915

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	no
Odor:	no
Sheen:	no
Floatables:	no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Coulton **Signature:**

Date Checked: 10-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 33 3/8" = 2.78 ft MM 10.18.19

Reference Point (description): top of culvert to WS

Water Quality Measurments

Temperature (°C) 15.8

Specific Conductivity (µs/cm) 84.9

Dissolved Oxygen (mg/L) 9.57

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/15/19 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/15/2019 /All locations, QA70 (SEIMN) Lab Ref No 1909-152

date 11/22/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	2	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	90	**±20**	12	**≤ 25**	2	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	2	**≤ 25**	4	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	3	**≤180**	≤1.0 mg/L 1.0 mg/L	102, 100	**±25**	98	**±15**	5, MS/MSD 2	**≤ 20**	5	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	4	**≤28**	≤1.0 mg/L 1.0 mg/L	83	**±25**	101	**±15**	1	**≤ 20**	0	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	4	**≤28**	≤0.01 mg/L 0.01 mg/L	93	**±25**	91	**±20**	2	**≤ 20**	0	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	10	**≤28**	0.025, ≤0.02–0.2 mg/L 0.1 mg/L	78-112	**±25**	92-109	**±20**	1-13, D = 0-0.05	**≤ 20**	D=0.15, D=0.89	**≤ 20**	OK	NONE. NO FLAG FOR MB DETECTION LESS THAN RL.

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/15/19 Page 2 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/15/2019 /All locations, QA70 (SEIMN) Lab Ref No 1909-152

date 11/22/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	89, 90	**±25**	NR	**±15**	6, MS/MSD 1	**≤ 20**	D= 0.5	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	106, 111	**±25**	NR	**±15**	7, MS/MSD 3	**≤ 20**	D = 0.8	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	91, 91	**±25**	NR	**±15**	D = 0.01, MS/MSD 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	106, 108	**±25**	NR	**±15**	NC, MS/MSD 2	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	4-59	**≤ 35**	43	**≤ 50**	OK	FLAG SEIMS J DUE TO HIGH LAB DUPLICATE RPD.

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 8, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1909-169

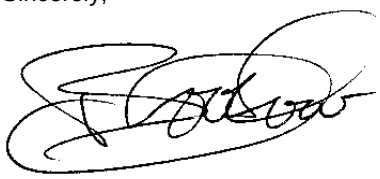
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on September 17, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

Case Narrative

Samples were collected on September 17, 2019 and received by the laboratory on September 17, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190917**					
Laboratory ID:	09-169-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**COUMI-20190917**					
Laboratory ID:	09-169-02					
Total Suspended Solids	**50**	2.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**COUMO-20190917**					
Laboratory ID:	09-169-03					
Total Suspended Solids	**11**	2.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**EVAMS-20190917**					
Laboratory ID:	09-169-04					
Total Suspended Solids	**16**	2.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**EVALSS-20190917**					
Laboratory ID:	09-169-05					
Total Suspended Solids	**12**	2.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**MONMN-20190917**					
Laboratory ID:	09-169-06					
Total Suspended Solids	**2.8**	1.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**MONMS-20190917**					
Laboratory ID:	09-169-07					
Total Suspended Solids	**4.8**	1.0	SM 2540D	9-17-19	9-18-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190917**					
Laboratory ID:	09-169-08					
Total Suspended Solids	**8.6**	1.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**SEIMN-20190917**					
Laboratory ID:	09-169-09					
Total Suspended Solids	**40**	1.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**SEIMS-20190917**					
Laboratory ID:	09-169-10					
Total Suspended Solids	**30**	2.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**TOSMI-20190917**					
Laboratory ID:	09-169-11					
Total Suspended Solids	**37**	2.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**TOMSO-20190917**					
Laboratory ID:	09-169-12					
Total Suspended Solids	**43**	2.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**TYLMI-20190917**					
Laboratory ID:	09-169-13					
Total Suspended Solids	**6.6**	1.0	SM 2540D	9-17-19	9-18-19	
Client ID:	**TYLMO-20190917**					
Laboratory ID:	09-169-14					
Total Suspended Solids	**5.4**	1.0	SM 2540D	9-17-19	9-18-19	

Date of Report: October 8, 2019
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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7I-20190917**					
Laboratory ID:	09-169-15					
Total Suspended Solids	**12**	2.0	SM 2540D	9-17-19	9-18-19	

Date of Report: October 8, 2019
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Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-17-19	9-18-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-169-10								
	ORIG	DUP							
Total Suspended Solids	**30.0**	**27.6**	NA	NA	NA	NA	8	23	
SPIKE BLANK									
Laboratory ID:	SB0917W1								
	SB		SB		SB				
Total Suspended Solids	**95.0**		100	NA	95	69-122	NA	NA	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190917**					
Laboratory ID:	09-169-01					
Turbidity	**1.1**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**COUMI-20190917**					
Laboratory ID:	09-169-02					
Turbidity	**25**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**COUMO-20190917**					
Laboratory ID:	09-169-03					
Turbidity	**12**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**EVAMS-20190917**					
Laboratory ID:	09-169-04					
Turbidity	**9.7**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**EVALSS-20190917**					
Laboratory ID:	09-169-05					
Turbidity	**8.0**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**MONMN-20190917**					
Laboratory ID:	09-169-06					
Turbidity	**2.3**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**MONMS-20190917**					
Laboratory ID:	09-169-07					
Turbidity	**3.4**	0.10	EPA 180.1	9-17-19	9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190917**					
Laboratory ID:	09-169-08					
Turbidity	**5.8**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**SEIMN-20190917**					
Laboratory ID:	09-169-09					
Turbidity	**25**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**SEIMS-20190917**					
Laboratory ID:	09-169-10					
Turbidity	**14**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**TOSMI-20190917**					
Laboratory ID:	09-169-11					
Turbidity	**16**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**TOMSO-20190917**					
Laboratory ID:	09-169-12					
Turbidity	**22**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**TYLMI-20190917**					
Laboratory ID:	09-169-13					
Turbidity	**3.7**	0.10	EPA 180.1	9-17-19	9-17-19	
Client ID:	**TYLMO-20190917**					
Laboratory ID:	09-169-14					
Turbidity	**4.4**	0.10	EPA 180.1	9-17-19	9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7I-20190917**					
Laboratory ID:	09-169-15					
Turbidity	**5.8**	0.10	EPA 180.1	9-17-19	9-17-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917W1					
Turbidity	**ND**	0.10	EPA 180.1	9-17-19	9-17-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-163-01								
	ORIG	DUP							
Turbidity	**10.5**	**10.3**	NA	NA	NA	NA	2	15	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190917**					
Laboratory ID:	09-169-01					
Hardness	**15**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**COUMI-20190917**					
Laboratory ID:	09-169-02					
Hardness	**130**	5.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**COUMO-20190917**					
Laboratory ID:	09-169-03					
Hardness	**88**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**EVAMS-20190917**					
Laboratory ID:	09-169-04					
Hardness	**95**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**EVALSS-20190917**					
Laboratory ID:	09-169-05					
Hardness	**88**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**MONMN-20190917**					
Laboratory ID:	09-169-06					
Hardness	**75**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**MONMS-20190917**					
Laboratory ID:	09-169-07					
Hardness	**140**	5.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	

Date of Report: October 8, 2019
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Laboratory Reference: 1909-169
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190917**					
Laboratory ID:	09-169-08					
Hardness	**85**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**SEIMN-20190917**					
Laboratory ID:	09-169-09					
Hardness	**47**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**SEIMS-20190917**					
Laboratory ID:	09-169-10					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**TOSMI-20190917**					
Laboratory ID:	09-169-11					
Hardness	**66**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**TOMSO-20190917**					
Laboratory ID:	09-169-12					
Hardness	**120**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**TYLMI-20190917**					
Laboratory ID:	09-169-13					
Hardness	**85**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	
Client ID:	**TYLMO-20190917**					
Laboratory ID:	09-169-14					
Hardness	**58**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	

Date of Report: October 8, 2019
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Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7I-20190917**					
Laboratory ID:	09-169-15					
Hardness	**91**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0919WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	9-19-19	9-19-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-169-07										
	ORIG	DUP									
Hardness	**142**	**138**	NA		NA	NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	09-169-07										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**283**	**288**	132	132	142	107	111	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB0919WH1										
	SB		SB			SB					
Hardness	**131**		132		NA	99		85-115	NA	NA	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190917**					
Laboratory ID:	09-169-01					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**COUMI-20190917**					
Laboratory ID:	09-169-02					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**COUMO-20190917**					
Laboratory ID:	09-169-03					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**EVAMS-20190917**					
Laboratory ID:	09-169-04					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**EVALSS-20190917**					
Laboratory ID:	09-169-05					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**MONMN-20190917**					
Laboratory ID:	09-169-06					
Dissolved Organic Carbon	**6.7**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**MONMS-20190917**					
Laboratory ID:	09-169-07					
Dissolved Organic Carbon	**7.6**	1.0	SM 5310B	9-23-19	9-23-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190917**					
Laboratory ID:	09-169-08					
Dissolved Organic Carbon	**6.6**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**SEIMN-20190917**					
Laboratory ID:	09-169-09					
Dissolved Organic Carbon	**3.5**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**SEIMS-20190917**					
Laboratory ID:	09-169-10					
Dissolved Organic Carbon	**8.3**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TOSMI-20190917**					
Laboratory ID:	09-169-11					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TOMSO-20190917**					
Laboratory ID:	09-169-12					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TYLMI-20190917**					
Laboratory ID:	09-169-13					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TYLMO-20190917**					
Laboratory ID:	09-169-14					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	9-23-19	9-23-19	

Date of Report: October 8, 2019
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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7I-20190917**					
Laboratory ID:	09-169-15					
Dissolved Organic Carbon	**5.4**	1.0	SM 5310B	9-23-19	9-23-19	

Date of Report: October 8, 2019
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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0923D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	9-23-19	9-23-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-169-08								
	ORIG	DUP							
Dissolved Organic Carbon	**6.64**	**6.51**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	09-169-08								
	MS		MS		MS				
Dissolved Organic Carbon	**15.6**		10.0	6.64	90	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0923D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.31**		10.0	NA	93	87-122	NA	NA	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
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Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190917**					
Laboratory ID:	09-169-01					
Total Phosphorus	**0.022**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**COUMI-20190917**					
Laboratory ID:	09-169-02					
Total Phosphorus	**0.18**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**COUMO-20190917**					
Laboratory ID:	09-169-03					
Total Phosphorus	**0.10**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**EVAMS-20190917**					
Laboratory ID:	09-169-04					
Total Phosphorus	**0.045**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**EVALSS-20190917**					
Laboratory ID:	09-169-05					
Total Phosphorus	**0.054**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**MONMN-20190917**					
Laboratory ID:	09-169-06					
Total Phosphorus	**0.055**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**MONMS-20190917**					
Laboratory ID:	09-169-07					
Total Phosphorus	**0.055**	0.010	EPA 365.1	9-20-19	9-23-19	

Date of Report: October 8, 2019
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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190917**					
Laboratory ID:	09-169-08					
Total Phosphorus	**0.070**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**SEIMN-20190917**					
Laboratory ID:	09-169-09					
Total Phosphorus	**0.10**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**SEIMS-20190917**					
Laboratory ID:	09-169-10					
Total Phosphorus	**0.085**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**TOSMI-20190917**					
Laboratory ID:	09-169-11					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**TOMSO-20190917**					
Laboratory ID:	09-169-12					
Total Phosphorus	**0.13**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**TYLMI-20190917**					
Laboratory ID:	09-169-13					
Total Phosphorus	**0.052**	0.010	EPA 365.1	9-20-19	9-23-19	
Client ID:	**TYLMO-20190917**					
Laboratory ID:	09-169-14					
Total Phosphorus	**0.053**	0.010	EPA 365.1	9-20-19	9-23-19	

Date of Report: October 8, 2019
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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7I-20190917**					
Laboratory ID:	09-169-15					
Total Phosphorus	**0.042**	0.010	EPA 365.1	9-20-19	9-23-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0920W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	9-20-19	9-23-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-169-01								
	ORIG	DUP							
Total Phosphorus	**0.0217**	**0.0210**	NA	NA	NA	NA	3	14	
MATRIX SPIKE									
Laboratory ID:	09-169-01								
	MS		MS		MS				
Total Phosphorus	**0.245**		0.250	0.0217	89	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0920W1								
	SB		SB		SB				
Total Phosphorus	**0.226**		0.250	NA	90	78-113	NA	NA	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190917**					
Laboratory ID:	09-169-01					
Copper	**ND**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**ND**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**COUMI-20190917**					
Laboratory ID:	09-169-02					
Copper	**4.1**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**31**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**COUMO-20190917**					
Laboratory ID:	09-169-03					
Copper	**3.7**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**31**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**EVAMS-20190917**					
Laboratory ID:	09-169-04					
Copper	**ND**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**ND**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**EVALSS-20190917**					
Laboratory ID:	09-169-05					
Copper	**ND**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**ND**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**MONMN-20190917**					
Laboratory ID:	09-169-06					
Copper	**1.8**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**8.0**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**MONMS-20190917**					
Laboratory ID:	09-169-07					
Copper	**1.3**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**5.0**	5.0	EPA 200.8	9-19-19	9-19-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190917**					
Laboratory ID:	09-169-08					
Copper	**1.5**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**17**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**SEIMN-20190917**					
Laboratory ID:	09-169-09					
Copper	**1.7**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**5.6**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**SEIMS-20190917**					
Laboratory ID:	09-169-10					
Copper	**ND**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**5.4**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**TOSMI-20190917**					
Laboratory ID:	09-169-11					
Copper	**7.0**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**89**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**TOMSO-20190917**					
Laboratory ID:	09-169-12					
Copper	**3.4**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**45**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**TYLMI-20190917**					
Laboratory ID:	09-169-13					
Copper	**3.9**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**8.9**	5.0	EPA 200.8	9-19-19	9-19-19	
Client ID:	**TYLMO-20190917**					
Laboratory ID:	09-169-14					
Copper	**4.1**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**15**	5.0	EPA 200.8	9-19-19	9-19-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7I-20190917**					
Laboratory ID:	09-169-15					
Copper	**1.0**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**5.3**	5.0	EPA 200.8	9-19-19	9-19-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0919WH2					
Copper	**ND**	1.0	EPA 200.8	9-19-19	9-19-19	
Zinc	**ND**	5.0	EPA 200.8	9-19-19	9-19-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-169-15										
	ORIG	DUP									
Copper	**1.01**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**5.26**	**5.04**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	09-169-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**87.8**	**83.2**	100	100	1.01	**87**	**82**	75-125	5	20	
Zinc	**112**	**111**	100	100	5.26	**107**	**105**	75-125	1	20	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190917**					
Laboratory ID:	09-169-01					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	
Client ID:	**COUMI-20190917**					
Laboratory ID:	09-169-02					
Copper	**1.8**	1.0	EPA 200.8		9-20-19	
Zinc	**5.5**	5.0	EPA 200.8		9-20-19	
Client ID:	**COUMO-20190917**					
Laboratory ID:	09-169-03					
Copper	**2.4**	1.0	EPA 200.8		9-20-19	
Zinc	**16**	5.0	EPA 200.8		9-20-19	
Client ID:	**EVAMS-20190917**					
Laboratory ID:	09-169-04					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	
Client ID:	**EVALSS-20190917**					
Laboratory ID:	09-169-05					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	
Client ID:	**MONMN-20190917**					
Laboratory ID:	09-169-06					
Copper	**1.6**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	
Client ID:	**MONMS-20190917**					
Laboratory ID:	09-169-07					
Copper	**1.1**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190917**					
Laboratory ID:	09-169-08					
Copper	**1.3**	1.0	EPA 200.8		9-20-19	
Zinc	**8.0**	5.0	EPA 200.8		9-20-19	
Client ID:	**SEIMN-20190917**					
Laboratory ID:	09-169-09					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	
Client ID:	**SEIMS-20190917**					
Laboratory ID:	09-169-10					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	
Client ID:	**TOSMI-20190917**					
Laboratory ID:	09-169-11					
Copper	**3.3**	1.0	EPA 200.8		9-20-19	
Zinc	**27**	5.0	EPA 200.8		9-20-19	
Client ID:	**TOMSO-20190917**					
Laboratory ID:	09-169-12					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**7.0**	5.0	EPA 200.8		9-20-19	
Client ID:	**TYLMI-20190917**					
Laboratory ID:	09-169-13					
Copper	**3.3**	1.0	EPA 200.8		9-20-19	
Zinc	**5.2**	5.0	EPA 200.8		9-20-19	
Client ID:	**TYLMO-20190917**					
Laboratory ID:	09-169-14					
Copper	**2.9**	1.0	EPA 200.8		9-20-19	
Zinc	**7.5**	5.0	EPA 200.8		9-20-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7I-20190917**					
Laboratory ID:	09-169-15					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	

Date of Report: October 8, 2019
Samples Submitted: September 17, 2019
Laboratory Reference: 1909-169
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0920D1					
Copper	**ND**	1.0	EPA 200.8		9-20-19	
Zinc	**ND**	5.0	EPA 200.8		9-20-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-169-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	09-169-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**73.0**	**68.4**	80.0	80.0	ND	**91**	**86**	75-125	7	20	
Zinc	**79.2**	**72.2**	80.0	80.0	ND	**99**	**90**	75-125	9	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 4 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190917	Water	19-A015166	Micro, NUT
COUMI-20190917	Water	19-A015167	Micro, NUT
COUMO-20190917	Water	19-A015168	Micro, NUT
EVAMS-20190917	Water	19-A015169	Micro, NUT
EVALSS-20190917	Water	19-A015170	Micro, NUT
MONMN-20190917	Water	19-A015171	Micro, NUT
MONMS-20190917	Water	19-A015172	Micro, NUT
MONM-20190917	Water	19-A015173	Micro, NUT
SEIMN-20190917	Water	19-A015174	Micro, NUT
SEIMS-20190917	Water	19-A015175	Micro, NUT
TOSMI-20190917	Water	19-A015176	Micro, NUT
TOSMO-20190917	Water	19-A015177	Micro, NUT
TYLMI-20190917	Water	19-A015178	Micro, NUT
TYLMO-20190917	Water	19-A015179	Micro, NUT
QA71-20190917	Water	19-A015180	Micro, NUT

Your samples were received on Tuesday, September 17, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

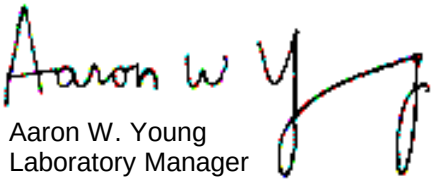
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 4 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 09-169

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 09-169
All results reported on an as received basis.

Date Received: 09/17/19
Date Reported: 10/ 4/19

AMTEST Identification Number **19-A015166**
Client Identification **COLM-20190917**
Sampling Date **09/17/19, 11:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	98.	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	0.70	mg/l		0.1			
Total Nitrogen (TKN)	0.668	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.031	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015167**
Client Identification **COUMI-20190917**
Sampling Date **09/17/19, 09:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	7800	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.19	mg/l		0.1			
Total Nitrogen (TKN)	0.879	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.31	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015168**
Client Identification **COUMO-20190917**
Sampling Date **09/17/19, 09:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.11	mg/l		0.1			
Total Nitrogen (TKN)	0.678	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.43	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015169**
Client Identification **EVAMS-20190917**
Sampling Date **09/17/19, 09:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	600	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	2.38	mg/l		0.1			
Total Nitrogen (TKN)	0.781	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	1.6	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015170**
Client Identification **EVALSS-20190917**
Sampling Date **09/17/19, 10:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	180	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.70	mg/l		0.1			
Total Nitrogen (TKN)	0.605	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015171**
Client Identification **MONMN-20190917**
Sampling Date **09/17/19, 11:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	240	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.572	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.056	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015172**
Client Identification **MONMS-20190917**
Sampling Date **09/17/19, 11:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	0.76	mg/l		0.1			
Total Nitrogen (TKN)	0.670	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.089	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015173**
Client Identification **MONM-20190917**
Sampling Date **09/17/19, 11:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.581	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.16	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015174**
Client Identification **SEIMN-20190917**
Sampling Date **09/17/19, 10:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	170	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	0.58	mg/l		0.1			
Total Nitrogen (TKN)	0.373	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.21	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015175**
Client Identification **SEIMS-20190917**
Sampling Date **09/17/19, 11:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.11	mg/l		0.1			
Total Nitrogen (TKN)	0.966	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015176**
Client Identification **TOSMI-20190917**
Sampling Date **09/17/19, 09:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.31	mg/l		0.1			
Total Nitrogen (TKN)	0.676	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.63	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015177**
Client Identification **TOSMO-20190917**
Sampling Date **09/17/19, 10:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1300	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.12	mg/l		0.1			
Total Nitrogen (TKN)	0.520	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.60	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015178**
Client Identification **TYLMI-20190917**
Sampling Date **09/17/19, 10:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	280	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.38	mg/l		0.1			
Total Nitrogen (TKN)	0.627	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.75	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015179**
Client Identification **TYLMO-20190917**
Sampling Date **09/17/19, 10:20**

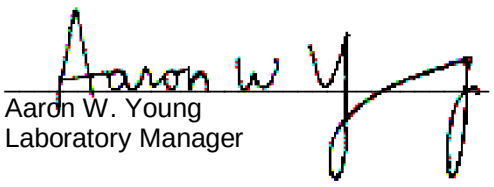
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	720	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	0.77	mg/l		0.1			
Total Nitrogen (TKN)	0.537	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	0.23	mg/l		0.02	SM4500NO3	SH	09/20/19

AMTEST Identification Number **19-A015180**
Client Identification **QA71-20190917**
Sampling Date **09/17/19, 10:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		1	SM 9222D	AG	09/18/19
Total Nitrogen (NOX&TKN)	1.62	mg/l		0.1			
Total Nitrogen (TKN)	0.525	mg/l		0.2	SM4500N	SH	09/25/19
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	SH	09/20/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 19-A015166 to 19-A015180

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A015171	Fecal coliform	CFU/100 ml	240	200	18.
19-A015186	Fecal coliform	CFU/100 ml	18.	35.	64.
19-A015096	Total Nitrogen (TKN)	mg/l	0.238	0.287	19.
19-A015107	Total Nitrogen (TKN)	mg/l	1.56	1.54	1.3
19-A015140	Total Nitrogen (TKN)	mg/l	42.3	42.9	1.4
19-A015171	Total Nitrogen (TKN)	mg/l	0.572	0.599	4.6
19-A015200	Total Nitrogen (TKN)	mg/l	0.686	0.684	0.29
19-A015210	Total Nitrogen (TKN)	mg/l	0.471	0.504	6.8
19-A015244	Total Nitrogen (TKN)	mg/l	1.21	1.20	0.83
19-A014744	Total Nitrate + Nitrite	mg/l	3.6	3.4	5.7
19-A014833	Total Nitrate + Nitrite	mg/l	0.072	0.084	15.
19-A014980	Total Nitrate + Nitrite	mg/l	1.6	1.5	6.5
19-A015091	Total Nitrate + Nitrite	mg/l	0.12	0.11	8.7
19-A015103	Total Nitrate + Nitrite	mg/l	0.29	0.24	19.
19-A015113	Total Nitrate + Nitrite	mg/l	0.092	0.10	8.3
19-A015163	Total Nitrate + Nitrite	mg/l	1.4	1.6	13.
19-A015173	Total Nitrate + Nitrite	mg/l	0.16	0.16	0.00
19-A015184	Total Nitrate + Nitrite	mg/l	0.22	0.20	9.5

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A015096	Total Nitrogen (TKN)	mg/l	0.238	2.33	2.00	104.60 %
19-A015107	Total Nitrogen (TKN)	mg/l	1.56	3.62	2.00	103.00 %
19-A015140	Total Nitrogen (TKN)	mg/l	42.3	64.7	20.0	112.00 %
19-A015171	Total Nitrogen (TKN)	mg/l	0.572	2.72	2.00	107.40 %
19-A015200	Total Nitrogen (TKN)	mg/l	0.686	2.84	2.00	107.70 %
19-A015210	Total Nitrogen (TKN)	mg/l	0.471	2.69	2.00	110.95 %
19-A015244	Total Nitrogen (TKN)	mg/l	1.21	3.34	2.00	106.50 %
19-A014744	Total Nitrate + Nitrite	mg/l	3.6	14.	10.	104.00 %
19-A014833	Total Nitrate + Nitrite	mg/l	0.072	1.1	1.0	102.80 %
19-A014980	Total Nitrate + Nitrite	mg/l	1.6	2.5	1.0	90.00 %
19-A015091	Total Nitrate + Nitrite	mg/l	0.12	1.1	1.0	98.00 %
19-A015103	Total Nitrate + Nitrite	mg/l	0.29	1.3	1.0	101.00 %
19-A015113	Total Nitrate + Nitrite	mg/l	0.092	1.0	1.0	90.80 %
19-A015163	Total Nitrate + Nitrite	mg/l	1.4	2.3	1.0	90.00 %
19-A015173	Total Nitrate + Nitrite	mg/l	0.16	1.1	1.0	94.00 %
19-A015184	Total Nitrate + Nitrite	mg/l	0.22	1.0	1.0	78.00 %

QC Summary for sample numbers: 19-A015166 to 19-A015180...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	1.07	107. %
Total Nitrogen (TKN)	mg/l	1.00	1.09	109. %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.96	96.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	0.025
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-169

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20190917 15166	9/17/19	11:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20190917 67	9/17/19	9:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190917 68	9/17/19	9:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190917 69	9/17/19	9:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190917 70	9/17/19	10:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190917 71	9/17/19	11:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190917 72	9/17/19	11:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190917 73	9/17/19	11:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190917 74	9/17/19	10:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190917 75	9/17/19	11:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	9/17/19	13:25	
Received by:	AmTest T=9.3	9/17/19	1:25	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-169

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190917 15176	9/17/19	9:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190917 77	9/17/19	10:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190917 78	9/17/19	10:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMC-20190917 79	9/17/19	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
16	QA71-20190917 80	9/17/19	10:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	9/17/19	1325	
Received by:	AMTEST T=9.3	9/17/19	1:25	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

Chain of Custody

Page 1 of 2

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: HERRERA
Project Number: 14-05806-000
Project Name: RPWS
Project Manager: GEORGE IFNER
Sampled by:

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 09-169

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	~~NWTPH-HCID~~ TSS (SM 2540D)	~~NWTPH-Gx/BTEX~~ Turbidity (EPA 180.1)	~~NWTPH-Gx~~ Hardness (EPA 200.7 SM 2340B)	~~NWTPH-Dx (Acid/SG Clean-up)~~ DOC (SM 5310B) *	~~Volatiles 8260C~~ Fecal Coliform (SM 9222D)	~~Halogenated Volatiles 8260C~~ Total Phosphorus (EPA 365.1)	~~EDB EPA 8011 (Water Only)~~ Total Nitrogen (SM 4500 N-B)	~~Semivolatiles 8270D/SIM (with low-level PAHs)~~ Total Zn (200.8)	~~PAHs 8270D/SIM (low-level)~~ Dissolved Cu, Zn (200.8) *	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A					% Moisture
1	COLM-20190917	9/17/19	11:10	water	7	X	X	X	X	X	X	X	X	X												
2	COUMI-20190917		9:45																							
3	COUMO-20190917		9:25																							
4	EVAMS-20190917		9:45																							
5	EVALS-20190917		10:00																							
6	MONMN-20190917		11:45																							
7	MONMS-20190917		11:20																							
8	*MONM-20190917		11:05																							
9	SEIMN-20190917		10:40																							
10	SEIMS-20190917		11:45																							

	Signature	Company	Date	Time
Relinquished		Herrera	9/17/19	1223
Received		OSE	9/17/19	1223
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
* field filtered with 0.45µm filter within 15 minutes of collecting sample
** Lid of TSS bottle is cracked

Data Package: Standard ☐ Level III ☐ Level IV ☐
Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Herrera
Project Number: 14-05806-000
Project Name: RPWS
Project Manager: George Ifther
Sampled by:

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 09-169

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers
11	TOSM1-20190917	9/17/19	0920	water	7
12	TOSMO-20190917		1005		
13	TYLM1-20190917		1040		
14	TYLMO-20190917		1020		
15	QA71-20190917		1010		

Lab ID	NWTPH-HCID	TSS (SM 2540 D)	NWTPH-Gx/BTEX	Turbidity (EPA 180.1)	NWTPH-Dx	Hardness (SM 2340B)	NWTPH-Dx (☐ Acid / ☐ SG Clean-up)	DOC (SM 5310B) *	Volatiles 8260C	Fecal Coliform (SM 9222D)	Halogenated Volatiles 8260C	Total Phosphorus (EPA 365.1)	EDB EPA 8011 (Waters Only)	Total Nitrogen (SM 4500 N)	Semivolatiles 8270D/SIM (with low-level PAHs)	Total Zn (200.8)	PAHs 8270D/SIM (low-level)	Dissolved Cu, Zn (200.8) *	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	% Moisture
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
12																											
13																											
14																											
15																											

	Signature	Company	Date	Time
Relinquished		Herrera	9/17/19	1223
Received		OSE	9/17/19	1223
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
* field filtered with 0.45 µm within 15 minutes of collecting sample

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

Chain of Custody

Page 1 of 2

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: HERRERA
Project Number: 14-05806-000
Project Name: RPWS
Project Manager: GEORGE IFNER
Sampled by:

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 09-169

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID (TSS (SM 2540D))	NWTPH-Gx/BTEX (Turbidity (EPA 180.1))	NWTPH-Gx (Hardness (SM 2340B))	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C (DOC (SM 5310B)*)	Halogenated Volatiles 8260C (Fecal Coliform (SM 9222D))	EDB EPA 8011 Waters Only (Total Phosphorus (EPA 365.1))	Semivolatiles 8270D/SIM (with low-level PAHs) (Total Nitrogen (SM 4500 N-C))	PAHs 8270D/SIM (low-level) (Total Zn (200.8)*)	PCBs 8082A (Dissolved Cu, Zn (200.8)*)	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A					% Moisture
1	COLM-20190917	9/17/19	11:10	water		X	X	X	X	X	X	X	X	X												
2	COUMI-20190917		9:45																							
3	COUM10-20190917		9:25																							
4	EVAMS-20190917		9:45																							
5	EVALS-20190917		10:00																							
6	MONMN-20190917		11:45																							
7	MONMS-20190917		11:20																							
8	*MONM-20190917		11:05																							
9	SEIMN-20190917		10:40																							
10	SEIMS-20190917		11:45																							

	Signature	Company	Date	Time
Relinquished		Herrera	9/17/19	1223
Received		OSE	9/17/19	1223
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
* field filtered with 0.45 µm filter within 15 minutes of collecting sample
** Lid of TSS bottle is cracked

Data Package: Standard ☐ Level III ☐ Level IV ☐
Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Herrera
Project Number: 14-05806-000
Project Name: RPWS
Project Manager: George Dither
Sampled by:

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 09-169

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	% Moisture
11	TOSM1-20190917	9/17/19	0920	water		X	X	X	X	X	X	X	X	X									
12	TOSM0-20190917		1005																				
13	TYLM1-20190917		1040																				
14	TYLM0-20190917		1020																				
15	QA71-20190917		1010																				

	Signature	Company	Date	Time
Relinquished		Herrera	9/17/19	1223
Received		COE	9/17/19	1223
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
* Field filtered with 0.45 µm within 15 minutes of collecting sample

Data Package: Standard ☐ Level III ☐ Level IV ☐
Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/17/19 **Sample Time:** 1110 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1115 PST:

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60° Rainy

Water Quality Sampling

Sample ID: COLM-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	slight yellow tint
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lantz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.46

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.7

Specific Conductivity (µs/cm) 46.7

Dissolved Oxygen (mg/L) 7.88

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM MMH

Sample Date: 9/17/19 **Sample Time:** 945 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 950 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 60°

Water Quality Sampling

Sample ID: COUMI-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	N/A
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 X
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.60

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.2

Specific Conductivity (µs/cm) 247.4

Dissolved Oxygen (mg/L) 10.14

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM MMH

Sample Date: 9.17.19 **Sample Time:** 925 PDT: X

Base Flow or Storm Event? (S) **Field Filtered Time:** 930 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 60°

Water Quality Sampling

Sample ID: COUMO-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: –

Filter blank sample ID: –

Transfer blank sample ID: –

Visual and Olfactory Conditions:

Clarity: slight turbidity

Color: N/A

Odor: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 10-22-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.37

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.5

Specific Conductivity (µs/cm) 205.8

Dissolved Oxygen (mg/L) 9.55

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Macs, E. Bliss

Sample Date: 9/17/19 **Sample Time:** 0945 PDT

Base Flow or Storm Event? **Field Filtered Time:** 0950 PST

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°, Rainy

Water Quality Sampling

Sample ID: EVAMS-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	clear
Odor:	no
Sheen:	no
Floatables:	no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E Lantz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 x

MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.89

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.8

Specific Conductivity (µs/cm) 212.2

Dissolved Oxygen (mg/L) 10.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/17/19

Sample Time: 1000 (QA 1010) PDT: / 1015 PST:

Base Flow or Storm Event?

Field Filtered Time: 1010

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°, Rainy

Water Quality Sampling

Sample ID: EVALSS-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	YES
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	QA T1-20190917
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lentz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

MM 10.16.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.7

Specific Conductivity (µs/cm) 195.9

Dissolved Oxygen (mg/L) 10.50

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM MMH

Sample Date: 9/17/19 **Sample Time:** 1105 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1116 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy 60°

Water Quality Sampling

Sample ID: MONMN-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	N/A
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Coombe **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 13
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~0.2~~ → 9.2 MM 10.10.19

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.2

Specific Conductivity (µs/cm) 179.9

Dissolved Oxygen (mg/L) 9.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH MM

Sample Date: 9/17/19 **Sample Time:** 11:20 PDT: X

Base Flow or Storm Event? (Storm Event) **Field Filtered Time:** 11:25 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Cloudy 60°

Water Quality Sampling

Sample ID: MONMS-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	N/A
Odor:	organic
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Z. Coutts **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.71

Reference Point (description): Top of PVC pipe down

Water Quality Measurments

Temperature (°C) 13.6

Specific Conductivity (µs/cm) 327.6

Dissolved Oxygen (mg/L) 7.17

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N.Maas, K.Bliss

Sample Date: 9/17/19 **Sample Time:** 1145 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1150 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60°, Rainy

Water Quality Sampling

Sample ID: MONM-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: slight brown tint

Odor: none

Sheen: none

Floatables: slight bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Cantrell **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO initials:

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 x MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 14.4

Specific Conductivity (µs/cm) 204.5

Dissolved Oxygen (mg/L) 9.99

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/17/19 **Sample Time:** 1040 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1045 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60°, Rainy

Water Quality Sampling

Sample ID: SEIMN-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	clear
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Smith **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 x MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.7

Reference Point (description): top of bolt

Water Quality Measurments

Temperature (°C) 12.0

Specific Conductivity (µs/cm) 113.5

Dissolved Oxygen (mg/L) 10.45

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM MMH

Sample Date: 9/17/19 **Sample Time:** 11:45 PDT: X PST:

Base Flow or Storm Event?

Field Filtered Time: 11:50
(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Cloudy 60°

Water Quality Sampling

Sample ID:

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR
Color: N/A
Odor: N/A
Sheen: N/A
Floatables: FOAM

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.74

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.1

Specific Conductivity (µs/cm) 118.9

Dissolved Oxygen (mg/L) 10.06

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 9/17/19 **Sample Time:** 0920 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0925 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSHMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°, Rainy

Water Quality Sampling

Sample ID: TOSHMI-20190717

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	slight (very) brown
Odor:	no
Sheen:	no
Floatables:	no

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Curtis **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2 X

MM 10.18.19

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.86

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 16.2

Specific Conductivity (µs/cm) 1485

Dissolved Oxygen (mg/L) 9.64

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM MMH

Sample Date: 9/17/19 **Sample Time:** 10:05 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 10:10 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 60°

Water Quality Sampling

Sample ID: TOSMO-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Slight turbidity

Color: N/A

Odor: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Leutz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.64

Reference Point (description): 86

Water Quality Measurments

Temperature (°C) 12.4

Specific Conductivity (µs/cm) 264.4

Dissolved Oxygen (mg/L) 10.61

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH MM

Sample Date: 9/17/19 **Sample Time:** 1040 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1045 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 60°

Water Quality Sampling

Sample ID: TYLMI-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	N/A
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T Leuth **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4ft 6.5" = 4.54' mm 10.18.19

Reference Point (description): Top of culvert dam

Water Quality Measurments

Temperature (°C) 14.5

Specific Conductivity (µs/cm) 198.7

Dissolved Oxygen (mg/L) 9.60

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM MMH

Sample Date: 9/17/19 **Sample Time:** 1020 PDT: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 1025 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 60°

Water Quality Sampling

Sample ID: TYLMO-20190917

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	N/A
Odor:	N/A
Sheen:	N/A
Floatables:	Bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lewis **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1 (circled)
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.75

Reference Point (description): Top of culvert down

Water Quality Measurments

Temperature (°C) 14.1

Specific Conductivity (µs/cm) 134.1

Dissolved Oxygen (mg/L) 9.97

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/18/19 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/17/19 /All locations, QA71 (EVALSS) Lab Ref No 1909-169

date 11/22/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	1	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	95	**±20**	8	**≤ 25**	0	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	2	**≤ 25**	32	**≤ 25**	OK	NONE. NO FLAG FOR SLIGHT FIELD DUPLICATE RPD EXCEEDANCE.
Hardness	OK / SM 2340B	NA	**NA**	2	**≤180**	≤1.0 mg/L 1.0 mg/L	107, 111	**±25**	99	**±15**	3, MS/MSD 2	**≤ 20**	3	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	6	**≤28**	≤1.0 mg/L 1.0 mg/L	90	**±25**	93	**±15**	2	**≤ 20**	2	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6	**≤28**	≤0.01 mg/L 0.01 mg/L	89	**±25**	90	**±20**	D=0.02	**≤ 20**	D = 0.01	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	8	**≤28**	≤0.1 mg/L 0.1 mg/L	78-112	**±25**	92-109	**±20**	0.3-13, D= 0-0.05	**≤ 20**	14, 0	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/18/19 Page 2 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/17/19 /All locations, QA71 (EVALSS) Lab Ref No 1909-169

date 11/22/2019

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	87, 82	**±25**	MS/MSD 5	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	107, 105	**±25**	MS/MSD 1	**±15**	4	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	3	**≤180**	≤1.0 µg/L 1.0 µg/L	91, 86	**±25**	MS/MSD 7	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	3	**≤180**	≤5.0 µg/L 5.0 µg/L	99, 90	**±25**	MS/MSD 9	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	18, 64	**≤ 35**	48	**≤ 50**	OK	NONE. NO FLAG FOR LAB DUPLICATE RPD EXCEEDANCE, BATCH SAMPLE.

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 14, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1909-227

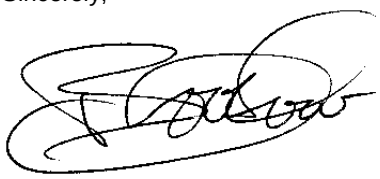
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on September 20, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

Case Narrative

Samples were collected on September 20, 2019 and received by the laboratory on September 20, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190920**					
Laboratory ID:	09-227-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**COUMI-20190920**					
Laboratory ID:	09-227-02					
Total Suspended Solids	**10**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**COUMO-20190920**					
Laboratory ID:	09-227-03					
Total Suspended Solids	**1.0**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**EVAMS-20190920**					
Laboratory ID:	09-227-04					
Total Suspended Solids	**7.0**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**EVALSS-20190920**					
Laboratory ID:	09-227-05					
Total Suspended Solids	**9.4**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**MONMN-20190920**					
Laboratory ID:	09-227-06					
Total Suspended Solids	**2.2**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**MONMS-20190920**					
Laboratory ID:	09-227-07					
Total Suspended Solids	**7.0**	1.0	SM 2540D	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190920**					
Laboratory ID:	09-227-08					
Total Suspended Solids	**1.4**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**SEIMN-20190920**					
Laboratory ID:	09-227-09					
Total Suspended Solids	**7.4**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**SEIMS-20190920**					
Laboratory ID:	09-227-10					
Total Suspended Solids	**4.6**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TOSMI-20190920**					
Laboratory ID:	09-227-11					
Total Suspended Solids	**2.6**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TOSMO-20190920**					
Laboratory ID:	09-227-12					
Total Suspended Solids	**1.8**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TYLMI-20190920**					
Laboratory ID:	09-227-13					
Total Suspended Solids	**2.4**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TYLMO-20190920**					
Laboratory ID:	09-227-14					
Total Suspended Solids	**10**	1.0	SM 2540D	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA-20190920**					
Laboratory ID:	09-227-15					
Total Suspended Solids	**2.2**	1.0	SM 2540D	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0924W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-24-19	9-25-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-227-12								
	ORIG	DUP							
Total Suspended Solids	**1.80**	**2.40**	NA	NA	NA	NA	29	23	C
SPIKE BLANK									
Laboratory ID:	SB0924W2								
	SB		SB		SB				
Total Suspended Solids	**119**		100	NA	119	69-122	NA	NA	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190920**					
Laboratory ID:	09-227-01					
Turbidity	**0.86**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**COUMI-20190920**					
Laboratory ID:	09-227-02					
Turbidity	**7.3**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**COUMO-20190920**					
Laboratory ID:	09-227-03					
Turbidity	**1.2**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**EVAMS-20190920**					
Laboratory ID:	09-227-04					
Turbidity	**3.1**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**EVALSS-20190920**					
Laboratory ID:	09-227-05					
Turbidity	**5.0**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**MONMN-20190920**					
Laboratory ID:	09-227-06					
Turbidity	**1.3**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**MONMS-20190920**					
Laboratory ID:	09-227-07					
Turbidity	**3.1**	0.10	EPA 180.1	9-20-19	9-20-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190920**					
Laboratory ID:	09-227-08					
Turbidity	**1.5**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**SEIMN-20190920**					
Laboratory ID:	09-227-09					
Turbidity	**3.8**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**SEIMS-20190920**					
Laboratory ID:	09-227-10					
Turbidity	**2.6**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**TOSMI-20190920**					
Laboratory ID:	09-227-11					
Turbidity	**1.3**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**TOSMO-20190920**					
Laboratory ID:	09-227-12					
Turbidity	**1.0**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**TYLMI-20190920**					
Laboratory ID:	09-227-13					
Turbidity	**1.3**	0.10	EPA 180.1	9-20-19	9-20-19	
Client ID:	**TYLMO-20190920**					
Laboratory ID:	09-227-14					
Turbidity	**5.8**	0.10	EPA 180.1	9-20-19	9-20-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA-20190920**					
Laboratory ID:	09-227-15					
Turbidity	**1.8**	0.10	EPA 180.1	9-20-19	9-20-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0920W1					
Turbidity	**ND**	0.10	EPA 180.1	9-20-19	9-20-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-227-01								
	ORIG	DUP							
Turbidity	**0.860**	**0.940**	NA	NA	NA	NA	9	15	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190920**					
Laboratory ID:	09-227-01					
Hardness	**16**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**COUMI-20190920**					
Laboratory ID:	09-227-02					
Hardness	**150**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**COUMO-20190920**					
Laboratory ID:	09-227-03					
Hardness	**130**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**EVAMS-20190920**					
Laboratory ID:	09-227-04					
Hardness	**88**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**EVALSS-20190920**					
Laboratory ID:	09-227-05					
Hardness	**96**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**MONMN-20190920**					
Laboratory ID:	09-227-06					
Hardness	**96**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**MONMS-20190920**					
Laboratory ID:	09-227-07					
Hardness	**140**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190920**					
Laboratory ID:	09-227-08					
Hardness	**98**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**SEIMN-20190920**					
Laboratory ID:	09-227-09					
Hardness	**49**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**SEIMS-20190920**					
Laboratory ID:	09-227-10					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TOSMI-20190920**					
Laboratory ID:	09-227-11					
Hardness	**140**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TOSMO-20190920**					
Laboratory ID:	09-227-12					
Hardness	**120**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TYLMI-20190920**					
Laboratory ID:	09-227-13					
Hardness	**100**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TYLMO-20190920**					
Laboratory ID:	09-227-14					
Hardness	**74**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**QA-20190920**					
Laboratory ID:	09-227-15					
Hardness	**91**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0924WH3					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-227-01										
	ORIG	DUP									
Hardness	**15.6**	**15.5**	NA		NA	NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	09-227-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**153**	**152**	132	132	15.6	104	103	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0924WH3										
	SB		SB			SB					
Hardness	**141**		132		NA	107		85-115	NA	NA	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190920**					
Laboratory ID:	09-227-01					
Dissolved Organic Carbon	**14**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**COUMI-20190920**					
Laboratory ID:	09-227-02					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**COUMO-20190920**					
Laboratory ID:	09-227-03					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**EVAMS-20190920**					
Laboratory ID:	09-227-04					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**EVALSS-20190920**					
Laboratory ID:	09-227-05					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**MONMN-20190920**					
Laboratory ID:	09-227-06					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**MONMS-20190920**					
Laboratory ID:	09-227-07					
Dissolved Organic Carbon	**7.6**	1.0	SM 5310B	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190920**					
Laboratory ID:	09-227-08					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**SEIMN-20190920**					
Laboratory ID:	09-227-09					
Dissolved Organic Carbon	**2.8**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**SEIMS-20190920**					
Laboratory ID:	09-227-10					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TOSMI-20190920**					
Laboratory ID:	09-227-11					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TOSMO-20190920**					
Laboratory ID:	09-227-12					
Dissolved Organic Carbon	**2.9**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TYLMI-20190920**					
Laboratory ID:	09-227-13					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	9-23-19	9-23-19	
Client ID:	**TYLMO-20190920**					
Laboratory ID:	09-227-14					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA-20190920**					
Laboratory ID:	09-227-15					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0923D2					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	9-23-19	9-23-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-227-02								
	ORIG	DUP							
Dissolved Organic Carbon	**4.27**	**4.27**	NA	NA	NA	NA	0	15	
MATRIX SPIKE									
Laboratory ID:	09-227-02								
	MS		MS		MS				
Dissolved Organic Carbon	**14.3**		10.0	4.27	100	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0923D2								
	SB		SB		SB				
Dissolved Organic Carbon	**10.5**		10.0	NA	105	87-122	NA	NA	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190920**					
Laboratory ID:	09-227-01					
Total Phosphorus	**0.025**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**COUMI-20190920**					
Laboratory ID:	09-227-02					
Total Phosphorus	**0.14**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**COUMO-20190920**					
Laboratory ID:	09-227-03					
Total Phosphorus	**0.073**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**EVAMS-20190920**					
Laboratory ID:	09-227-04					
Total Phosphorus	**0.043**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**EVALSS-20190920**					
Laboratory ID:	09-227-05					
Total Phosphorus	**0.036**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**MONMN-20190920**					
Laboratory ID:	09-227-06					
Total Phosphorus	**0.037**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**MONMS-20190920**					
Laboratory ID:	09-227-07					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190920**					
Laboratory ID:	09-227-08					
Total Phosphorus	**0.041**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**SEIMN-20190920**					
Laboratory ID:	09-227-09					
Total Phosphorus	**0.041**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**SEIMS-20190920**					
Laboratory ID:	09-227-10					
Total Phosphorus	**0.048**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**TOSMI-20190920**					
Laboratory ID:	09-227-11					
Total Phosphorus	**0.061**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**TOSMO-20190920**					
Laboratory ID:	09-227-12					
Total Phosphorus	**0.067**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**TYLMI-20190920**					
Laboratory ID:	09-227-13					
Total Phosphorus	**0.028**	0.010	EPA 365.1	9-23-19	9-23-19	
Client ID:	**TYLMO-20190920**					
Laboratory ID:	09-227-14					
Total Phosphorus	**0.088**	0.010	EPA 365.1	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA-20190920**					
Laboratory ID:	09-227-15					
Total Phosphorus	**0.037**	0.010	EPA 365.1	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0923W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	9-23-19	9-23-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-227-01								
	ORIG	DUP							
Total Phosphorus	**0.0247**	**0.0241**	NA	NA	NA	NA	2	14	
MATRIX SPIKE									
Laboratory ID:	09-227-01								
	MS		MS		MS				
Total Phosphorus	**0.248**		0.250	0.0247	89	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0923W1								
	SB		SB		SB				
Total Phosphorus	**0.225**		0.250	NA	90	78-113	NA	NA	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190920**					
Laboratory ID:	09-227-01					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**5.1**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**COUMI-20190920**					
Laboratory ID:	09-227-02					
Copper	**1.6**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**17**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**COUMO-20190920**					
Laboratory ID:	09-227-03					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**8.1**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**EVAMS-20190920**					
Laboratory ID:	09-227-04					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**EVALSS-20190920**					
Laboratory ID:	09-227-05					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**MONMN-20190920**					
Laboratory ID:	09-227-06					
Copper	**1.4**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**5.3**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**MONMS-20190920**					
Laboratory ID:	09-227-07					
Copper	**1.7**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**5.7**	5.0	EPA 200.8	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190920**					
Laboratory ID:	09-227-08					
Copper	**1.2**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**8.6**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**SEIMN-20190920**					
Laboratory ID:	09-227-09					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**SEIMS-20190920**					
Laboratory ID:	09-227-10					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TOSMI-20190920**					
Laboratory ID:	09-227-11					
Copper	**2.0**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**23**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TOSMO-20190920**					
Laboratory ID:	09-227-12					
Copper	**1.0**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**11**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TYLMI-20190920**					
Laboratory ID:	09-227-13					
Copper	**16**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**70**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TYLMO-20190920**					
Laboratory ID:	09-227-14					
Copper	**3.3**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**21**	5.0	EPA 200.8	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA-20190920**					
Laboratory ID:	09-227-15					
Copper	**1.6**	1.0	EPA 200.8	9-24-19	9-24-19	
Zinc	**5.7**	5.0	EPA 200.8	9-24-19	9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0924WH1					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-24-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-24-19	
Laboratory ID:	MB0924WH2					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-24-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-24-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-227-15										
	ORIG	DUP									
Copper	**1.58**	**1.50**	NA	NA		NA		NA	5	20	
Zinc	**5.70**	**5.62**	NA	NA		NA		NA	1	20	
Laboratory ID:	09-241-15										
	ORIG	DUP									
Copper	**1.52**	**1.47**	NA	NA		NA		NA	3	20	
Zinc	**11.5**	**11.3**	NA	NA		NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	09-227-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**98.4**	**97.6**	100	100	1.58	**97**	**96**	75-125	1	20	
Zinc	**103**	**104**	100	100	5.70	**98**	**98**	75-125	0	20	
Laboratory ID:	09-241-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**98.2**	**97.0**	100	100	1.52	**97**	**96**	75-125	1	20	
Zinc	**104**	**105**	100	100	11.5	**93**	**94**	75-125	1	20	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190920**					
Laboratory ID:	09-227-01					
Copper	**ND**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**COUMI-20190920**					
Laboratory ID:	09-227-02					
Copper	**ND**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**COUMO-20190920**					
Laboratory ID:	09-227-03					
Copper	**ND**	1.0	EPA 200.8		9-23-19	
Zinc	**5.1**	5.0	EPA 200.8		9-24-19	
Client ID:	**EVAMS-20190920**					
Laboratory ID:	09-227-04					
Copper	**ND**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**EVALSS-20190920**					
Laboratory ID:	09-227-05					
Copper	**ND**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**MONMN-20190920**					
Laboratory ID:	09-227-06					
Copper	**1.4**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**MONMS-20190920**					
Laboratory ID:	09-227-07					
Copper	**1.5**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190920**					
Laboratory ID:	09-227-08					
Copper	**1.2**	1.0	EPA 200.8		9-23-19	
Zinc	**5.3**	5.0	EPA 200.8		9-24-19	
Client ID:	**SEIMN-20190920**					
Laboratory ID:	09-227-09					
Copper	**ND**	1.0	EPA 200.8	9-23-19	9-23-19	
Zinc	**ND**	5.0	EPA 200.8	9-23-19	9-23-19	
Client ID:	**SEIMS-20190920**					
Laboratory ID:	09-227-10					
Copper	**ND**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**TOSMI-20190920**					
Laboratory ID:	09-227-11					
Copper	**1.7**	1.0	EPA 200.8		9-23-19	
Zinc	**18**	5.0	EPA 200.8		9-24-19	
Client ID:	**TOSMO-20190920**					
Laboratory ID:	09-227-12					
Copper	**ND**	1.0	EPA 200.8		9-25-19	
Zinc	**9.1**	5.0	EPA 200.8		9-24-19	
Client ID:	**TYLMI-20190920**					
Laboratory ID:	09-227-13					
Copper	**5.1**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**TYLMO-20190920**					
Laboratory ID:	09-227-14					
Copper	**1.6**	1.0	EPA 200.8		9-23-19	
Zinc	**6.8**	5.0	EPA 200.8		9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA-20190920**					
Laboratory ID:	09-227-15					
Copper	**1.3**	1.0	EPA 200.8		9-23-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 20, 2019
Laboratory Reference: 1909-227
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0923F1					
Copper	**ND**	1.0	EPA 200.8	9-23-19	9-23-19	
Zinc	**ND**	5.0	EPA 200.8	9-23-19	9-23-19	
Laboratory ID:	MB0924D1					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-227-09										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Laboratory ID:	09-241-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**5.86**	**5.88**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-227-09										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**75.6**	**69.6**	80.0	80.0	ND	**95**	**87**	75-125	8	20	
Zinc	**72.4**	**73.6**	80.0	80.0	ND	**91**	**92**	75-125	2	20	
Laboratory ID:	09-241-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**68.0**	**72.6**	80.0	80.0	ND	**85**	**91**	75-125	7	20	
Zinc	**78.2**	**86.6**	80.0	80.0	5.86	**90**	**101**	75-125	10	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 14 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190920	Water	19-A015503	Micro, NUT
COUMI-20190920	Water	19-A015504	Micro, NUT
COUMO-20190920	Water	19-A015505	Micro, NUT
EVAMS-20190920	Water	19-A015506	Micro, NUT
EVALSS-20190920	Water	19-A015507	Micro, NUT
MONMN-20190920	Water	19-A015508	Micro, NUT
MONMS-20190920	Water	19-A015509	Micro, NUT
MONM-20190920	Water	19-A015510	Micro, NUT
SEIMN-20190920	Water	19-A015511	Micro, NUT
SEIMS-20190920	Water	19-A015512	Micro, NUT
TOSMI-20190920	Water	19-A015513	Micro, NUT
TOSMI-20190920	Water	19-A015514	Micro, NUT
TYLMI-20190920	Water	19-A015515	Micro, NUT
TYLMO-20190920	Water	19-A015516	Micro, NUT
QA72-20190920	Water	19-A015517	Micro, NUT

Your samples were received on Friday, September 20, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 14 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 09-227

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 09-227
All results reported on an as received basis.

Date Received: 09/20/19
Date Reported: 10/14/19

AMTEST Identification Number **19-A015503**
Client Identification **COLM-20190920**
Sampling Date **09/20/19, 10:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	10.	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.61	mg/l		0.1			
Total Nitrogen (TKN)	0.612	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015504**
Client Identification **COUMI-20190920**
Sampling Date **09/20/19, 10:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	150	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.372	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.13	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015505**
Client Identification **COUMO-20190920**
Sampling Date **09/20/19, 12:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	450	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.64	mg/l		0.1			
Total Nitrogen (TKN)	0.363	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015506**
Client Identification **EVAMS-20190920**
Sampling Date **09/20/19, 10:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	150	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	1.88	mg/l		0.1			
Total Nitrogen (TKN)	0.582	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	1.3	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015507**
Client Identification **EVALSS-20190920**
Sampling Date **09/20/19, 12:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	2.13	mg/l		0.1			
Total Nitrogen (TKN)	0.628	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	1.5	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015508**
Client Identification **MONMN-20190920**
Sampling Date **09/20/19, 14:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	60.	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.445	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.10	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015509**
Client Identification **MONMS-20190920**
Sampling Date **09/20/19, 14:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	150	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.76	mg/l		0.1			
Total Nitrogen (TKN)	0.759	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015510**
Client Identification **MONM-20190920**
Sampling Date **09/20/19, 13:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	440	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.57	mg/l		0.1			
Total Nitrogen (TKN)	0.476	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.090	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015511**
Client Identification **SEIMN-20190920**
Sampling Date **09/20/19, 09:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	330	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	1.27	mg/l		0.1			
Total Nitrogen (TKN)	0.303	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.97	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015512**
Client Identification **SEIMS-20190920**
Sampling Date **09/20/19, 13:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.48	mg/l		0.1			
Total Nitrogen (TKN)	0.359	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015513**
Client Identification **TOSMI-20190920**
Sampling Date **09/20/19, 11:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	390	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	1.16	mg/l		0.1			
Total Nitrogen (TKN)	0.325	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.84	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015514**
Client Identification **TOSMI-20190920**
Sampling Date **09/20/19, 11:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	130	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.79	mg/l		0.1			
Total Nitrogen (TKN)	0.334	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.46	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015515**
Client Identification **TYLMI-20190920**
Sampling Date **09/20/19, 10:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	730	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.416	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015516**
Client Identification **TYLMO-20190920**
Sampling Date **09/20/19, 11:05**

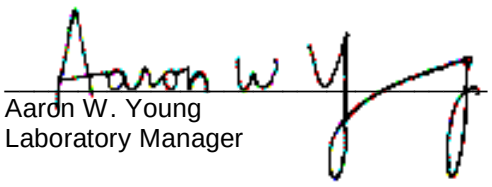
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	70.	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	1.07	mg/l		0.1			
Total Nitrogen (TKN)	0.489	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.58	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015517**
Client Identification **QA72-20190920**
Sampling Date **09/20/19, 13:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		1	SM 9222D	KF	09/20/19
Total Nitrogen (NOX&TKN)	0.46	mg/l		0.1			
Total Nitrogen (TKN)	0.410	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.050	mg/l		0.02	SM4500NO3	SH	09/30/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 19-A015503 to 19-A015517

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A015504	Fecal coliform	CFU/100 ml	150	170	12.
19-A015517	Fecal coliform	CFU/100 ml	200	130	42.
19-A015511	Total Nitrogen (TKN)	mg/l	0.303	0.325	7.0
19-A015532	Total Nitrogen (TKN)	mg/l	0.523	0.537	2.6
19-A015544	Total Nitrogen (TKN)	mg/l	0.651	0.660	1.4
19-A015648	Total Nitrogen (TKN)	mg/l	4.83	4.89	1.2
19-A015440	Total Nitrate + Nitrite	mg/l	0.49	0.55	12.
19-A015508	Total Nitrate + Nitrite	mg/l	0.10	0.094	6.2
19-A015526	Total Nitrate + Nitrite	mg/l	0.17	0.18	5.7
19-A015541	Total Nitrate + Nitrite	mg/l	0.068	0.070	2.9

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A015511	Total Nitrogen (TKN)	mg/l	0.303	2.29	2.00	99.35 %
19-A015532	Total Nitrogen (TKN)	mg/l	0.523	2.67	2.00	107.35 %
19-A015544	Total Nitrogen (TKN)	mg/l	0.651	2.73	2.00	103.95 %
19-A015648	Total Nitrogen (TKN)	mg/l	4.83	6.78	2.00	97.50 %
19-A015440	Total Nitrate + Nitrite	mg/l	0.49	1.3	1.0	81.00 %
19-A015508	Total Nitrate + Nitrite	mg/l	0.10	1.1	1.0	100.00 %
19-A015526	Total Nitrate + Nitrite	mg/l	0.17	0.96	1.0	79.00 %
19-A015541	Total Nitrate + Nitrite	mg/l	0.068	0.97	1.0	90.20 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.06	106. %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.95	95.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

QC Summary for sample numbers: 19-A015503 to 19-A015517...

BLANKS continued....

ANALYTE	UNITS	RESULT
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-227

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20190920 15503	9/20/19	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20190920 04	9/20/19	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190920 05	9/20/19	12:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190920 06	9/20/19	10:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190920 07	9/20/19	12:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190920 08	9/20/19	14:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190920 09	9/20/19	14:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190920 10	9/20/19	13:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190920 11	9/20/19	9:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190920 12	9/20/19	13:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	9/20/19	1525	EDDs - CSV
Received by:	Amtest	9/20/19	1525	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

Amtest T=1.8

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-227

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190920 15513	9/20/19	11:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190920 14	9/20/19	11:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190920 15	9/20/19	10:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20190920 16	9/20/19	11:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
16	QA72-20190920 17	9/20/19	13:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	[signature]	OSE	9/20/19	1525	
Received by:	[signature]	AmTest	9/20/19	1525	
Relinquished by:					
Received by:					
Relinquished by:					
Received by:					

EDDs - CSV

Reporting Limits:

Fecal Coliform - 1.0 cfu/100ml

Total Nitrogen - .10 mg/L

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 09-227

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0920	9/20/19	1020	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0920			Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0920		1200	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0920		1050	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0920		1240	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0920		1405	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0920			Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0920		1345	Water	7	X	X	X	X	X	X	X	X	X			
9**	SEIMN-2019 0920		945	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0920		1330	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0920		1150	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0920		1130	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0920		1050	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0920		1105	Water	7	X	X	X	X	X	X	X	X	X			
15	QA - 20190920		1355	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 9/20/19 Received by _____ Date 9/20/19
Firm _____ Time 1440 Firm OSE Time 1440

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

** not filtered for Cu + Zn sample

CHAIN OF CUSTODY

Page 1 of 1

...ental Inc.

14... ...reet, Redmond, WA 98052
Telep... ...883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 09-227

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
	COLM-2019 0920	9/20/19	~~1020~~ 10:15	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2019 0920 *		1210	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2019 0920		~~1200~~ 11:50	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2019 0920		~~1050~~ ~~10:45~~ 12:35	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2019 0920		~~1240~~ ~~12:25~~ 12:45	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2019 0920		~~1405~~ 13:50	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2019 0920 *		1410	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2019 0920		~~1345~~ 13:40	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2019 0920		~~945~~ 9:40	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2019 0920		~~1330~~ 13:25	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2019 0920		~~1150~~ 11:45	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2019 0920		~~1130~~ 11:25	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2019 0920		~~1050~~ 10:45	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2019 0920		~~1105~~ 11:00	Water	7	X	X	X	X	X	X	X	X	X			
	QA - 20190920		~~1355~~ 14:00	Water	7	X	X	X	X	X	X	X	X	X			
	72																

Relinquished by _____ Date 9/20/19 Received by Wheel (Esc) Date 9/20/19

Firm _____ Time 1440 Firm OSE Time 1440

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

* times estimated by MM 10.18.19

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	Gretchen Kayser
Meter:	YSI Pro DSS #2
Date/Time:	9/20/19 @ 17:30
Barometric Pressure Start of Day:	mmHg: 762.4 Time: 14:50
Barometric Pressure End of Day:	mmHg: Time:

DSS #2

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.9	0	25.3	Herrera DI Water
Conductivity (µS/cm)	977	1,000	24.2	
Conductivity (µS/cm)	100.7	100	24.2	
DO % Saturation	100.5	100	24.5	

DSS #2

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.6	0	~~24.5~~ 24.2	
Conductivity (µS/cm)	97.9	100	23.7	
DO % Saturation	100.6	100	23.7	

DSS #1

			°C
µS/cm	1.4	0	23.5
mS/cm	96.2	100	23.2
%	101.0	100	23.0

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	N. MAAS, M. MULLEN
Meter:	YSI PRO DSS #1
Date/Time:	9.20.19 14:50
Barometric Pressure Start of Day:	mmHg: 762.1 Time: 14:50
Barometric Pressure End of Day:	mmHg: Time:

#2 on back

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.7	0	23.3	Herrera DI water
Conductivity (µS/cm)	1004	1,000	23.7	
Conductivity (µS/cm)	103.1	100	22.9	
DO % Saturation	100.5	100	22.90	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.9	0	23.5	
Conductivity (µS/cm)	96.2	100	23.2	
DO % Saturation	101.0	100	23.0	

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/20/19 **Sample Time:** 10:15 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 10:20 PST:

(Must filter within 15 minutes of collection)

SITE ID: Colm

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60° overcast

Water Quality Sampling

Sample ID: Colm - 20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: red/yellow tint

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lantz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.46

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.6°C

Specific Conductivity (µs/cm) 47.6

Dissolved Oxygen (mg/L) 8.08

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/20/19 **Sample Time:** no time 12:10 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:15 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUM1

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: COUM1-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lantz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.55

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.5

Specific Conductivity (µs/cm) 321.9

Dissolved Oxygen (mg/L) 10.26

* assume timed near COUM0 (@ 11:50)

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/20/19 **Sample Time:** 11:50 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:00 PST:

(Must filter within 15 minutes of collection)

SITE ID: COWMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: COWMO-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lentz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.31

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.4

Specific Conductivity (µs/cm) ~~272.0~~ 272.2

Dissolved Oxygen (mg/L) 9.60

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 7/20/19 **Sample Time:** 12:35 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1240 PST

(Must filter within 15 minutes of collection)

SITE ID: ~~Evalss~~ EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 61 sprinkling

Water Quality Sampling

Sample ID: ~~Evalss~~ EVAMS-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Curtis **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.89

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.4

Specific Conductivity (µs/cm) 272.2

Dissolved Oxygen (mg/L) 9.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** ~~10~~12 45 PDT: ~~PST~~

Base Flow or Storm Event? **Field Filtered Time:** ~~10~~12 50 PST:

(Must filter within 15 minutes of collection)

SITE ID: ~~Evams~~ EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: ~~Evams~~ EVALSS 20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	↓
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	↓
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	↓
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	↓
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	↓

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Cantu **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.30

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 202.2

Dissolved Oxygen (mg/L) 10.68

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 1350 - 1400 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1355 - 1409 PST:
(Must filter within 15 minutes of collection)

SITE ID: Monman

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp:

Water Quality Sampling

Sample ID: Monmn-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	yes
DOC *	HDPE	250 ml	1	HCL	"
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA72-20190920

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
Color: none
Odor: none
Sheen: none
Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~0.16~~ → 9.16 MM 10.10.19

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.9

Specific Conductivity (µs/cm) 212.2

Dissolved Oxygen (mg/L) 9.44

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 11-27-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 14:10 PDT: PST: no time

Base Flow or Storm Event? **Field Filtered Time:** 14:15

(Must filter within 15 minutes of collection)

SITE ID: Monms

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: Monms - 20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	ND
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lentz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 7.2

Reference Point (description): top of PVC pipe

Water Quality Measurments

Temperature (°C) 15.0

Specific Conductivity (µs/cm) 292.0

Dissolved Oxygen (mg/L) 6.20

* time: assume 14:10 ; close to MONMN @ 13:50

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 1340 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 13:45 PST:

(Must filter within 15 minutes of collection)

SITE ID: Monm

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: Monm-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Scott **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 14.4°C

Specific Conductivity (µs/cm) 233.9

Dissolved Oxygen (mg/L) 10.08

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/20/19 **Sample Time:** 9:40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 9:45 PST:

(Must filter within 15 minutes of collection)

SITE ID: Seimn

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 57° Overcast

Water Quality Sampling

Sample ID: SEIMN-2019-09-20

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lenton **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for mensurement (to nearest 100th of a foot)

Stream Stage (ft): 0.72

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.8 °C

Specific Conductivity (µs/cm) 117.5

Dissolved Oxygen (mg/L) 10.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 1325 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1330 PST

(Must filter within 15 minutes of collection)

SITE ID: Seims

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: Seims-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T Lauth **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.72

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.5°

Specific Conductivity (µs/cm) 125.7

Dissolved Oxygen (mg/L) 10.22

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 11:45 PDT:

~~Base Flow~~ or Storm Event? **Field Filtered Time:** 11:50 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMI

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 61 overcast

Water Quality Sampling

Sample ID: Tosmi-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lantz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): —

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.2

Specific Conductivity (µs/cm) 307.8

Dissolved Oxygen (mg/L) 10.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 11:25 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1130 PST:

(Must filter within 15 minutes of collection)

SITE ID: Tosmo

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: Tosmo-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no yes
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: ~~QA42-2019 0920~~ *

Filter blank sample ID: —

Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Smith **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): .55

Reference Point (description): 55@ SG

Water Quality Measurments

Temperature (°C) 13.0

Specific Conductivity (µs/cm) 266.4

Dissolved Oxygen (mg/L) 10.62

IGNORE! no QA @ this site.

* MM 10.16.19

~~time on COC: 1155~~

assume time was 11:35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 10:45 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1050 PST:

(Must filter within 15 minutes of collection)

SITE ID: Tylmi

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60° overcast

Water Quality Sampling

Sample ID: Tylmi - 20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: E Leuth **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES / NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.85

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 13.6

Specific Conductivity (µs/cm) 47.6

Dissolved Oxygen (mg/L) 8.08

these match COLM. I suspect these are incorrect.

MM 10.18.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/20/19 **Sample Time:** 1100 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1105 PST:

(Must filter within 15 minutes of collection)

SITE ID: Tylmo

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 61° overcast

Water Quality Sampling

Sample ID: Tylmo-20190920

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NO
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: D Lentz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.9

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 14.2

Specific Conductivity (µs/cm) 163.2

Dissolved Oxygen (mg/L) 10.14

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/18/19 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/20/19 /All locations, QA72 (MONMN) Lab Ref No 1909-227

date 11/22/19

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	5	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	119	**±20**	D=0.6	**≤ 25**	D=0	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	9	**≤ 25**	32	**≤ 25**	OK	NONE. NO FLAG FOR MINOR FIELD DUPLICATE RPD EXCEEDANCE
Hardness	OK / SM 2340B	NA	**NA**	4	**≤180**	≤1.0 mg/L 1.0 mg/L	104, 103	**±25**	107, MS/MSD 1	**±15**	1	**≤ 20**	5	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	3	**≤28**	≤1.0 mg/L 1.0 mg/L	100	**±25**	105	**±15**	0	**≤ 20**	11	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	3	**≤28**	≤0.01 mg/L 0.01 mg/L	89	**±25**	90	**±20**	D= 0.0006	**≤ 20**	D=0	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	13	**≤28**	≤0.1 mg/L 0.1 mg/L	81-107	**±25**	92-106	**±20**	1-3, D=0.002 -0.060	**≤ 20**	D=0.035 D=0.05	**≤ 20**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/18/19 Page 2 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/20/19 /All locations, QA72 (MONMN) Lab Ref No 1909-227

date 11/22/19

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤1.0 µg/L 1.0 µg/L	96-97	**±25**	NR	**±15**	D=0.08, D=0.05, MS/MSD 1, 1	**≤ 20**	D=0.2	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	93-98	**±25**	NR	**±15**	D=0.08, D=0.2, MS/MSD 0, 1	**≤ 20**	D=0.4	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	3	**≤180**	≤1.0 µg/L 1.0 µg/L	85-95	**±25**	NR	**±15**	NC, MS/MSD 8, 7	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	90-101	**±25**	NR	**±15**	NC, MS/MSD 2, 10	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	12, 42	**≤ 35**	108	**≤ 50**	OK	FLAG MONMN J DUE TO HIGH FIELD DUPE RPD. NO FLAG FOR SLIGHT LAB DUPE RPD EXCEEDANCE.

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 14, 2019

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1909-241

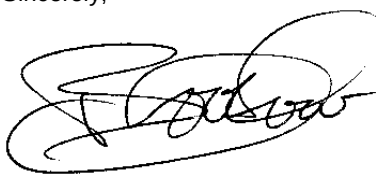
Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on September 23, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

Case Narrative

Samples were collected on September 22, 2019 and received by the laboratory on September 23, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190922**					
Laboratory ID:	09-241-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**COUMI-20190922**					
Laboratory ID:	09-241-02					
Total Suspended Solids	**180**	2.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**COUMO-20190922**					
Laboratory ID:	09-241-03					
Total Suspended Solids	**20**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**EVAMS-20190922**					
Laboratory ID:	09-241-04					
Total Suspended Solids	**15**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**EVALSS-20190922**					
Laboratory ID:	09-241-05					
Total Suspended Solids	**12**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**MONMN-20190922**					
Laboratory ID:	09-241-06					
Total Suspended Solids	**6.6**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**MONMS-20190922**					
Laboratory ID:	09-241-07					
Total Suspended Solids	**6.6**	1.0	SM 2540D	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190922**					
Laboratory ID:	09-241-08					
Total Suspended Solids	**6.4**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**SEIMN-20190922**					
Laboratory ID:	09-241-09					
Total Suspended Solids	**31**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**SEIMS-20190922**					
Laboratory ID:	09-241-10					
Total Suspended Solids	**22**	2.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TOSMI-20190922**					
Laboratory ID:	09-241-11					
Total Suspended Solids	**150**	2.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TOSMO-20190922**					
Laboratory ID:	09-241-12					
Total Suspended Solids	**44**	1.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TYLMI-20190922**					
Laboratory ID:	09-241-13					
Total Suspended Solids	**18**	2.0	SM 2540D	9-24-19	9-25-19	
Client ID:	**TYLMO-20190922**					
Laboratory ID:	09-241-14					
Total Suspended Solids	**75**	2.0	SM 2540D	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA73-20190922**					
Laboratory ID:	09-241-15					
Total Suspended Solids	**7.8**	1.0	SM 2540D	9-24-19	9-25-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0924W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	9-24-19	9-25-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-241-02								
	ORIG	DUP							
Total Suspended Solids	**175**	**174**	NA	NA	NA	NA	1	23	
SPIKE BLANK									
Laboratory ID:	SB0924W1								
	SB		SB		SB				
Total Suspended Solids	**114**		100	NA	114	69-122	NA	NA	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190922**					
Laboratory ID:	09-241-01					
Turbidity	**0.78**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**COUMI-20190922**					
Laboratory ID:	09-241-02					
Turbidity	**80**	0.50	EPA 180.1	9-23-19	9-23-19	
Client ID:	**COUMO-20190922**					
Laboratory ID:	09-241-03					
Turbidity	**7.6**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**EVAMS-20190922**					
Laboratory ID:	09-241-04					
Turbidity	**7.4**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**EVALSS-20190922**					
Laboratory ID:	09-241-05					
Turbidity	**6.1**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**MONMN-20190922**					
Laboratory ID:	09-241-06					
Turbidity	**2.7**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**MONMS-20190922**					
Laboratory ID:	09-241-07					
Turbidity	**5.2**	0.10	EPA 180.1	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190922**					
Laboratory ID:	09-241-08					
Turbidity	**7.0**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**SEIMN-20190922**					
Laboratory ID:	09-241-09					
Turbidity	**15**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**SEIMS-20190922**					
Laboratory ID:	09-241-10					
Turbidity	**10**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**TOSMI-20190922**					
Laboratory ID:	09-241-11					
Turbidity	**59**	0.20	EPA 180.1	9-23-19	9-23-19	
Client ID:	**TOSMO-20190922**					
Laboratory ID:	09-241-12					
Turbidity	**11**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**TYLMI-20190922**					
Laboratory ID:	09-241-13					
Turbidity	**8.0**	0.10	EPA 180.1	9-23-19	9-23-19	
Client ID:	**TYLMO-20190922**					
Laboratory ID:	09-241-14					
Turbidity	**42**	0.20	EPA 180.1	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA73-20190922**					
Laboratory ID:	09-241-15					
Turbidity	**4.4**	0.10	EPA 180.1	9-23-19	9-23-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

TURBIDITY
EPA 180.1
QUALITY CONTROL

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0923W1					
Turbidity	**ND**	0.10	EPA 180.1	9-23-19	9-23-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-241-04								
	ORIG	DUP							
Turbidity	**7.42**	**7.70**	NA	NA	NA	NA	4	15	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190922**					
Laboratory ID:	09-241-01					
Hardness	**16**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**COUMI-20190922**					
Laboratory ID:	09-241-02					
Hardness	**140**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**COUMO-20190922**					
Laboratory ID:	09-241-03					
Hardness	**130**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**EVAMS-20190922**					
Laboratory ID:	09-241-04					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**EVALSS-20190922**					
Laboratory ID:	09-241-05					
Hardness	**92**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**MONMN-20190922**					
Laboratory ID:	09-241-06					
Hardness	**110**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**MONMS-20190922**					
Laboratory ID:	09-241-07					
Hardness	**150**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190922**					
Laboratory ID:	09-241-08					
Hardness	**100**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**SEIMN-20190922**					
Laboratory ID:	09-241-09					
Hardness	**45**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**SEIMS-20190922**					
Laboratory ID:	09-241-10					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TOSMI-20190922**					
Laboratory ID:	09-241-11					
Hardness	**120**	5.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TOSMO-20190922**					
Laboratory ID:	09-241-12					
Hardness	**120**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TYLMI-20190922**					
Laboratory ID:	09-241-13					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	
Client ID:	**TYLMO-20190922**					
Laboratory ID:	09-241-14					
Hardness	**89**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA73-20190922**					
Laboratory ID:	09-241-15					
Hardness	**100**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
Units: mg eqt. CaCO3/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0924WH4					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	9-24-19	9-24-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-241-01										
	ORIG	DUP									
Hardness	**16.0**	**16.2**	NA		NA	NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	09-241-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**154**	**152**	132	132	16.0	105	103	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0924WH4										
	SB		SB			SB					
Hardness	**137**		132		NA	104		85-115	NA	NA	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190922**					
Laboratory ID:	09-241-01					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**COUMI-20190922**					
Laboratory ID:	09-241-02					
Dissolved Organic Carbon	**4.6**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**COUMO-20190922**					
Laboratory ID:	09-241-03					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**EVAMS-20190922**					
Laboratory ID:	09-241-04					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**EVALSS-20190922**					
Laboratory ID:	09-241-05					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**MONMN-20190922**					
Laboratory ID:	09-241-06					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**MONMS-20190922**					
Laboratory ID:	09-241-07					
Dissolved Organic Carbon	**6.8**	1.0	SM 5310B	9-24-19	9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
Laboratory Reference: 1909-241
Project: 14-05806-000

DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190922**					
Laboratory ID:	09-241-08					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**SEIMN-20190922**					
Laboratory ID:	09-241-09					
Dissolved Organic Carbon	**2.8**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**SEIMS-20190922**					
Laboratory ID:	09-241-10					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**TOSMI-20190922**					
Laboratory ID:	09-241-11					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**TOSMO-20190922**					
Laboratory ID:	09-241-12					
Dissolved Organic Carbon	**2.9**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**TYLMI-20190922**					
Laboratory ID:	09-241-13					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	9-24-19	9-24-19	
Client ID:	**TYLMO-20190922**					
Laboratory ID:	09-241-14					
Dissolved Organic Carbon	**5.2**	1.0	SM 5310B	9-24-19	9-24-19	

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DISSOLVED ORGANIC CARBON
SM 5310B

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA73-20190922**					
Laboratory ID:	09-241-15					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	9-24-19	9-24-19	

Date of Report: October 14, 2019
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DISSOLVED ORGANIC CARBON
SM 5310B
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0924D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	9-24-19	9-24-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-241-02								
	ORIG	DUP							
Dissolved Organic Carbon	**4.63**	**4.57**	NA	NA	NA	NA	1	15	
MATRIX SPIKE									
Laboratory ID:	09-241-02								
	MS		MS		MS				
Dissolved Organic Carbon	**14.2**		10.0	4.63	96	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0924D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.0**		10.0	NA	100	87-122	NA	NA	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190922**					
Laboratory ID:	09-241-01					
Total Phosphorus	**0.025**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**COUMI-20190922**					
Laboratory ID:	09-241-02					
Total Phosphorus	**0.37**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**COUMO-20190922**					
Laboratory ID:	09-241-03					
Total Phosphorus	**0.10**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**EVAMS-20190922**					
Laboratory ID:	09-241-04					
Total Phosphorus	**0.030**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**EVALSS-20190922**					
Laboratory ID:	09-241-05					
Total Phosphorus	**0.048**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**MONMN-20190922**					
Laboratory ID:	09-241-06					
Total Phosphorus	**0.062**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**MONMS-20190922**					
Laboratory ID:	09-241-07					
Total Phosphorus	**0.067**	0.010	EPA 365.1	9-30-19	9-30-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190922**					
Laboratory ID:	09-241-08					
Total Phosphorus	**0.065**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**SEIMN-20190922**					
Laboratory ID:	09-241-09					
Total Phosphorus	**0.082**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**SEIMS-20190922**					
Laboratory ID:	09-241-10					
Total Phosphorus	**0.084**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**TOSMI-20190922**					
Laboratory ID:	09-241-11					
Total Phosphorus	**0.32**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**TOSMO-20190922**					
Laboratory ID:	09-241-12					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**TYLMI-20190922**					
Laboratory ID:	09-241-13					
Total Phosphorus	**0.067**	0.010	EPA 365.1	9-30-19	9-30-19	
Client ID:	**TYLMO-20190922**					
Laboratory ID:	09-241-14					
Total Phosphorus	**0.24**	0.010	EPA 365.1	9-30-19	9-30-19	

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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA73-20190922**					
Laboratory ID:	09-241-15					
Total Phosphorus	**0.061**	0.010	EPA 365.1	9-30-19	9-30-19	

Date of Report: October 14, 2019
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TOTAL PHOSPHORUS
EPA 365.1
QUALITY CONTROL

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0926W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	9-30-19	9-30-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-241-01								
	ORIG	DUP							
Total Phosphorus	**0.0251**	**0.0269**	NA	NA	NA	NA	7	14	
MATRIX SPIKE									
Laboratory ID:	09-241-01								
	MS		MS		MS				
Total Phosphorus	**0.264**		0.250	0.0251	96	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0926W1								
	SB		SB		SB				
Total Phosphorus	**0.251**		0.250	NA	100	78-113	NA	NA	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190922**					
Laboratory ID:	09-241-01					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**COUMI-20190922**					
Laboratory ID:	09-241-02					
Copper	**7.8**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**63**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**COUMO-20190922**					
Laboratory ID:	09-241-03					
Copper	**1.3**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**12**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**EVAMS-20190922**					
Laboratory ID:	09-241-04					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**EVALSS-20190922**					
Laboratory ID:	09-241-05					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**6.2**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**MONMN-20190922**					
Laboratory ID:	09-241-06					
Copper	**1.2**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**6.7**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**MONMS-20190922**					
Laboratory ID:	09-241-07					
Copper	**1.7**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**6.3**	5.0	EPA 200.8	9-24-19	9-25-19	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190922**					
Laboratory ID:	09-241-08					
Copper	**1.3**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**12**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**SEIMN-20190922**					
Laboratory ID:	09-241-09					
Copper	**1.3**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**SEIMS-20190922**					
Laboratory ID:	09-241-10					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**6.8**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TOSMI-20190922**					
Laboratory ID:	09-241-11					
Copper	**23**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**320**	13	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TOSMO-20190922**					
Laboratory ID:	09-241-12					
Copper	**1.8**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**24**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TYLMI-20190922**					
Laboratory ID:	09-241-13					
Copper	**3.8**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**13**	5.0	EPA 200.8	9-24-19	9-25-19	
Client ID:	**TYLMO-20190922**					
Laboratory ID:	09-241-14					
Copper	**6.1**	1.0	EPA 200.8	9-24-19	9-25-19	
Zinc	**43**	5.0	EPA 200.8	9-24-19	9-25-19	

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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA73-20190922**					
Laboratory ID:	09-241-15					
Copper	**1.5**	1.0	EPA 200.8	9-24-19	9-24-19	
Zinc	**12**	5.0	EPA 200.8	9-24-19	9-24-19	

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TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0924WH1					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-24-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-24-19	
Laboratory ID:	MB0924WH2					
Copper	**ND**	1.0	EPA 200.8	9-24-19	9-24-19	
Zinc	**ND**	5.0	EPA 200.8	9-24-19	9-24-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-227-15										
	ORIG	DUP									
Copper	**1.58**	**1.50**	NA	NA		NA		NA	5	20	
Zinc	**5.70**	**5.62**	NA	NA		NA		NA	1	20	
Laboratory ID:	09-241-15										
	ORIG	DUP									
Copper	**1.52**	**1.47**	NA	NA		NA		NA	3	20	
Zinc	**11.5**	**11.3**	NA	NA		NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	09-227-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**98.4**	**97.6**	100	100	1.58	**97**	**96**	75-125	1	20	
Zinc	**103**	**104**	100	100	5.70	**98**	**98**	75-125	0	20	
Laboratory ID:	09-241-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**98.2**	**97.0**	100	100	1.52	**97**	**96**	75-125	1	20	
Zinc	**104**	**105**	100	100	11.5	**93**	**94**	75-125	1	20	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20190922**					
Laboratory ID:	09-241-01					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**COUMI-20190922**					
Laboratory ID:	09-241-02					
Copper	**2.3**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**COUMO-20190922**					
Laboratory ID:	09-241-03					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**5.1**	5.0	EPA 200.8		9-24-19	
Client ID:	**EVAMS-20190922**					
Laboratory ID:	09-241-04					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**EVALSS-20190922**					
Laboratory ID:	09-241-05					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**MONMN-20190922**					
Laboratory ID:	09-241-06					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**MONMS-20190922**					
Laboratory ID:	09-241-07					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	

Date of Report: October 14, 2019
Samples Submitted: September 23, 2019
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Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20190922**					
Laboratory ID:	09-241-08					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**SEIMN-20190922**					
Laboratory ID:	09-241-09					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**SEIMS-20190922**					
Laboratory ID:	09-241-10					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**TOSMI-20190922**					
Laboratory ID:	09-241-11					
Copper	**3.4**	1.0	EPA 200.8		9-24-19	
Zinc	**28**	5.0	EPA 200.8		9-24-19	
Client ID:	**TOSMO-20190922**					
Laboratory ID:	09-241-12					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**7.1**	5.0	EPA 200.8		9-24-19	
Client ID:	**TYLMI-20190922**					
Laboratory ID:	09-241-13					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	
Client ID:	**TYLMO-20190922**					
Laboratory ID:	09-241-14					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**5.4**	5.0	EPA 200.8		9-24-19	

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DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA73-20190922**					
Laboratory ID:	09-241-15					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**5.9**	5.0	EPA 200.8		9-24-19	

Date of Report: October 14, 2019
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DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0923F1					
Copper	**ND**	1.0	EPA 200.8	9-23-19	9-23-19	
Zinc	**ND**	5.0	EPA 200.8	9-23-19	9-23-19	
Laboratory ID:	MB0924D1					
Copper	**ND**	1.0	EPA 200.8		9-24-19	
Zinc	**ND**	5.0	EPA 200.8		9-24-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	09-227-09									
	ORIG	DUP								
Copper	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Laboratory ID:	09-241-15									
	ORIG	DUP								
Copper	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Zinc	**5.86**	**5.88**	NA	NA		NA	NA	0	20	
MATRIX SPIKES										
Laboratory ID:	09-227-09									
	MS	MSD	MS	MSD		MS	MSD			
Copper	**75.6**	**69.6**	80.0	80.0	ND	**95**	**87**	75-125	8	20
Zinc	**72.4**	**73.6**	80.0	80.0	ND	**91**	**92**	75-125	2	20
Laboratory ID:	09-241-15									
	MS	MSD	MS	MSD		MS	MSD			
Copper	**68.0**	**72.6**	80.0	80.0	ND	**85**	**91**	75-125	7	20
Zinc	**78.2**	**86.6**	80.0	80.0	5.86	**90**	**101**	75-125	10	20

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 14 2019
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
COLM-20190922	Water	19-A015535	Micro, NUT
COUMI-20190922	Water	19-A015536	Micro, NUT
COUMO-20190922	Water	19-A015537	Micro, NUT
EVAMS-20190922	Water	19-A015538	Micro, NUT
EVALSS-20190922	Water	19-A015539	Micro, NUT
MONMN-20190922	Water	19-A015540	Micro, NUT
MONMS-20190922	Water	19-A015541	Micro, NUT
MONM-20190922	Water	19-A015542	Micro, NUT
SEIMN-20190922	Water	19-A015543	Micro, NUT
SEIMS-20190922	Water	19-A015544	Micro, NUT
TOSMI-20190922	Water	19-A015545	Micro, NUT
TOSMO-20190922	Water	19-A015546	Micro, NUT
TYLMI-20190922	Water	19-A015547	Micro, NUT
TYLMO-20190922	Water	19-A015548	Micro, NUT
QA73-20190922	Water	19-A015549	Micro, NUT

Your samples were received on Monday, September 23, 2019. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 14 2019
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 09-241

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	

Am Test Inc.
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Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 09-241
All results reported on an as received basis.

Date Received: 09/23/19
Date Reported: 10/14/19

AMTEST Identification Number **19-A015535**
Client Identification **COLM-20190922**
Sampling Date **09/22/19, 11:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.66	mg/l		0.1			
Total Nitrogen (TKN)	0.656	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015536**
Client Identification **COUMI-20190922**
Sampling Date **09/22/19, 09:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	5300	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	1.68	mg/l		0.1			
Total Nitrogen (TKN)	1.28	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.40	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015537**
Client Identification **COUMO-20190922**
Sampling Date **09/22/19, 09:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	980	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.385	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.30	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015538**
Client Identification **EVAMS-20190922**
Sampling Date **09/22/19, 09:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	480	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	2.18	mg/l		0.1			
Total Nitrogen (TKN)	0.482	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	1.7	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015539**
Client Identification **EVALSS-20190922**
Sampling Date **09/22/19, 10:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	180	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	1.67	mg/l		0.1			
Total Nitrogen (TKN)	0.469	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	1.2	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015540**
Client Identification **MONMN-20190922**
Sampling Date **09/22/19, 10:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	640	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.41	mg/l		0.1			
Total Nitrogen (TKN)	0.407	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015541**
Client Identification **MONMS-20190922**
Sampling Date **09/22/19, 10:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	130	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.616	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.068	mg/l		0.02	SM4500NO3	SH	09/30/19

AMTEST Identification Number **19-A015542**
Client Identification **MONM-20190922**
Sampling Date **09/22/19, 11:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1000	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.67	mg/l		0.1			
Total Nitrogen (TKN)	0.534	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	SH	10/01/19

AMTEST Identification Number **19-A015543**
Client Identification **SEIMN-20190922**
Sampling Date **09/22/19, 10:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	480	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.89	mg/l		0.1			
Total Nitrogen (TKN)	0.377	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.51	mg/l		0.02	SM4500NO3	SH	10/01/19

AMTEST Identification Number **19-A015544**
Client Identification **SEIMS-20190922**
Sampling Date **09/22/19, 11:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	780	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.651	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.23	mg/l		0.02	SM4500NO3	SH	10/01/19

AMTEST Identification Number **19-A015545**
Client Identification **TOSMI-20190922**
Sampling Date **09/22/19, 09:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1500	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	2.33	mg/l		0.1			
Total Nitrogen (TKN)	1.13	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	1.2	mg/l		0.02	SM4500NO3	SH	10/01/19

AMTEST Identification Number **19-A015546**
Client Identification **TOSMO-20190922**
Sampling Date **09/22/19, 09:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	940	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.86	mg/l		0.1			
Total Nitrogen (TKN)	0.378	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.48	mg/l		0.02	SM4500NO3	SH	10/01/19

AMTEST Identification Number **19-A015547**
Client Identification **TYLMI-20190922**
Sampling Date **09/22/19, 10:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	680	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	1.37	mg/l		0.1			
Total Nitrogen (TKN)	0.476	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.89	mg/l		0.02	SM4500NO3	SH	10/01/19

AMTEST Identification Number **19-A015548**
Client Identification **TYLMO-20190922**
Sampling Date **09/22/19, 09:50**

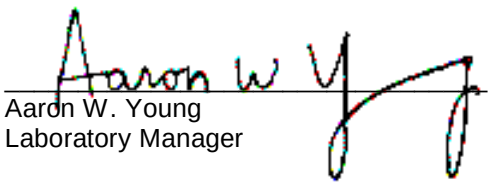
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2600	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.87	mg/l		0.1			
Total Nitrogen (TKN)	0.572	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.30	mg/l		0.02	SM4500NO3	SH	10/01/19

AMTEST Identification Number **19-A015549**
Client Identification **QA73-20190922**
Sampling Date **09/22/19, 11:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1000	CFU/100 ml		1	SM 9222D	AG	09/23/19
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.485	mg/l		0.2	SM4500N	SH	10/03/19
Total Nitrate + Nitrite	0.13	mg/l		0.02	SM4500NO3	SH	10/01/19



Aaron W. Young
Laboratory Manager

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Professional Analytical Services

QC Summary for sample numbers: 19-A015535 to 19-A015549

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A015540	Fecal coliform	CFU/100 ml	640	480	29.
19-A015549	Fecal coliform	CFU/100 ml	1000	860	15.
19-A015511	Total Nitrogen (TKN)	mg/l	0.303	0.325	7.0
19-A015532	Total Nitrogen (TKN)	mg/l	0.523	0.537	2.6
19-A015544	Total Nitrogen (TKN)	mg/l	0.651	0.660	1.4
19-A015648	Total Nitrogen (TKN)	mg/l	4.83	4.89	1.2
19-A015440	Total Nitrate + Nitrite	mg/l	0.49	0.55	12.
19-A015508	Total Nitrate + Nitrite	mg/l	0.10	0.094	6.2
19-A015526	Total Nitrate + Nitrite	mg/l	0.17	0.18	5.7
19-A015541	Total Nitrate + Nitrite	mg/l	0.068	0.070	2.9
19-A015587	Total Nitrate + Nitrite	mg/l	1.2	1.2	0.00
19-A015590	Total Nitrate + Nitrite	mg/l	0.049	0.040	20.
19-A015616	Total Nitrate + Nitrite	mg/l	0.24	0.23	4.3
19-A015626	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
19-A015665	Total Nitrate + Nitrite	mg/l	0.034	0.038	11.
19-A015730	Total Nitrate + Nitrite	mg/l	1.4	1.5	6.9
19-A015794	Total Nitrate + Nitrite	mg/l	0.61	0.60	1.7
19-A015866	Total Nitrate + Nitrite	mg/l	0.033	0.029	13.
19-A016009	Total Nitrate + Nitrite	mg/l	0.024	0.021	13.
19-A016035	Total Nitrate + Nitrite	mg/l	0.48	0.41	16.
19-A016039	Total Nitrate + Nitrite	mg/l	0.34	0.38	11.

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A015511	Total Nitrogen (TKN)	mg/l	0.303	2.29	2.00	99.35 %
19-A015532	Total Nitrogen (TKN)	mg/l	0.523	2.67	2.00	107.35 %
19-A015544	Total Nitrogen (TKN)	mg/l	0.651	2.73	2.00	103.95 %
19-A015648	Total Nitrogen (TKN)	mg/l	4.83	6.78	2.00	97.50 %
19-A015440	Total Nitrate + Nitrite	mg/l	0.49	1.3	1.0	81.00 %
19-A015508	Total Nitrate + Nitrite	mg/l	0.10	1.1	1.0	100.00 %
19-A015526	Total Nitrate + Nitrite	mg/l	0.17	0.96	1.0	79.00 %
19-A015541	Total Nitrate + Nitrite	mg/l	0.068	0.97	1.0	90.20 %
19-A015587	Total Nitrate + Nitrite	mg/l	1.2	2.0	1.0	80.00 %
19-A015590	Total Nitrate + Nitrite	mg/l	0.049	1.1	1.0	105.10 %
19-A015616	Total Nitrate + Nitrite	mg/l	0.24	1.1	1.0	86.00 %
19-A015626	Total Nitrate + Nitrite	mg/l	< 0.02	0.88	1.0	88.00 %
19-A015665	Total Nitrate + Nitrite	mg/l	0.034	0.77	1.0	73.60 %
Duplicate	Total Nitrate + Nitrite	mg/l	1.5	11.	10.	95.00 %
19-A015794	Total Nitrate + Nitrite	mg/l	0.61	1.9	1.0	129.00 %
19-A015866	Total Nitrate + Nitrite	mg/l	0.033	1.2	1.0	116.70 %

QC Summary for sample numbers: 19-A015535 to 19-A015549...

MATRIX SPIKES continued....

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A016009	Total Nitrate + Nitrite	mg/l	0.024	0.89	1.0	86.60 %
19-A016035	Total Nitrate + Nitrite	mg/l	0.48	1.3	1.0	82.00 %
19-A016039	Total Nitrate + Nitrite	mg/l	0.34	1.2	1.0	86.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.06	106. %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.95	95.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.95	95.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.1	110. %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-241

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
1	COLM-20190922 15535	9/22/19	11:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20190922 36	9/22/19	9:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20190922 37	9/22/19	9:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20190922 38	9/22/19	9:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20190922 39	9/22/19	10:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20190922 40	9/22/19	10:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20190922 41	9/22/19	10:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20190922 42	9/22/19	11:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20190922 43	9/22/19	10:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20190922 44	9/22/19	11:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:		COE	9/23/19	1225	
Received by:		AMTEST T=1.6	9/23/19	12:25	EDDs - CSV
Relinquished by:					Reporting Limits:
Received by:					Fecal Coliform - 1.0 cfu/100ml
Relinquished by:					Total Nitrogen - .10 mg/L
Received by:					

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-241

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
11	TOSMI-20190922 15545	9/22/19	9:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20190922 46	9/22/19	9:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20190922 47	9/22/19	10:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20190922 48	9/22/19	9:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
~~16~~ 15	~~QA75-20190922~~ QA73-20190922 KL 49	9/22/19	11:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	ONE	9/23/19	1225	
Received by:	AMTEST T=1.6	9/23/19	12:25	EDDs - CSV
Relinquished by:				Reporting Limits:
Received by:				Fecal Coliform - 1.0 cfu/100ml
Relinquished by:				Total Nitrogen - .10 mg/L
Received by:				

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 09-241

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
1	COLM-2019 0922	09/22/19	1115	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0922		0920	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0922		0905	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0922		0950	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0922		1000	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0922		1005	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0922		1010	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0922		1140	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0922		1030	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0922		1115	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0922		0915	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0922		0930	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0922		1035	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0922		0950	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 73-20190922		1150	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date ~~9/23/19~~ Received by #17 Date 9/23/19.
Firm _____ Time ~~11:15~~ Firm _____ Time ~~11:30~~ 10:15.
Relinquished by _____ #17 Date 9/23 Received by _____ Date 9/23/19
Firm _____ 17 Time 11:31 Firm _____ Time 1131

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No. 09-241

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Suspended Solids (SM 2540D)	Turbidity (EPA 181.1)	Hardness (EPA 200.7 / SM 2340B)	Dissolved Organ Carbon (SM 5310B) *	Fecal Coliform (SM 9222D)	Total Phosphorus (EPA 365.1)	Total Nitrogen (SM 4500 N-B)	Total Cu and Zn (EPA 200.8)	Dissolved Cu and Zn (EPA 200.8) *			
						Requested Analyses											
1	COLM-2019 0922	09/22/19	1115	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 0922		0920	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 0922		0905	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 0922		0950	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 0922		1000	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 0922		1005	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 0922		1010	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 0922		1140	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 0922		1030	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 0922		1115	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 0922		0915	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 0922		0930	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 0922		1035	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 0922		0950	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 73-20190922	↓	1150	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 9/23/19 Received by #17 Date 9/23/19.
Firm _____ Time ~~10:15~~ Firm _____ Time 10:15.
Relinquished by _____ Date 9/23 Received by _____ Date 9/23/19
Firm _____ Time 11:31 Firm _____ Time 1131

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GC + KB

Sample Date: 9/22/19 **Sample Time:** 1110 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1145 PST:

(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 62°

Water Quality Sampling

Sample ID: COLM20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: mostly clear

Color: dark brown

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S Lamb **Signature:**

Date Checked: **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.46

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.4

Specific Conductivity (µs/cm) 49.8

Dissolved Oxygen (mg/L) 7.54

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/22/19 **Sample Time:** 915 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 920 PST:

(Must filter within 15 minutes of collection)

SITE ID: Coumi

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 59° raining

Water Quality Sampling

Sample ID: Coumi-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: turbid

Color: brown

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lamb **Signature:**

Date Checked: 10-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.62

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.7

Specific Conductivity (µs/cm) 261.5

Dissolved Oxygen (mg/L) 10.03

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/22/19 **Sample Time:** 900 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 905 PST:

(Must filter within 15 minutes of collection)

SITE ID: Coumo

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 59° raining

Water Quality Sampling

Sample ID: Coumo-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T Leuth **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.4

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.4

Specific Conductivity (µs/cm) 285.5

Dissolved Oxygen (mg/L) 9.63

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB, GLK

Sample Date: 9.22.19 **Sample Time:** 09:45 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 09:50 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVAMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain, 59°

Water Quality Sampling

Sample ID: EVAMS20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: mostly clear

Color: yellowish brown

Odor: NA

Sheen: NA

Floatables: some (v little)

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: KB Lantz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): SG

Reference Point (description): 3.89

Water Quality Measurments

Temperature (°C) 13.3

Specific Conductivity (µs/cm) 228.5

Dissolved Oxygen (mg/L) 10.23

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G/L + KB

Sample Date: 9/22/19 **Sample Time:** 0955 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1000 PST:

(Must filter within 15 minutes of collection)

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy +59°

Water Quality Sampling

Sample ID: EVALSS20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Slightly turbid & tan/brown

Color:

Odor: NA

Sheen: NA

Floatables: V little

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): .569

Reference Point (description): 2.30

Water Quality Measurments

Temperature (°C) 13.3

Specific Conductivity (µs/cm) 259.2

Dissolved Oxygen (mg/L) 10.39

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/22/19 **Sample Time:** 1000 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1605 PST:

(Must filter within 15 minutes of collection)

SITE ID: ~~Tylwai~~ Monmn

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60° raining

Water Quality Sampling

Sample ID: ~~Tylwai~~ Monmn-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Z. Lamb **Signature:**

Date Checked: 10-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.40 → 10.40 or 9.40 MM 10.18.19

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 14.6

Specific Conductivity (µs/cm) 240.3

Dissolved Oxygen (mg/L) 9.39

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/22/19 **Sample Time:** 1005 PDT: PST:

Base Flow or Storm Event? (Storm Event circled)

Field Filtered Time: 1010 (Must filter within 15 minutes of collection)

SITE ID: Monms

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60° raining

Water Quality Sampling

Sample ID: Monms-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: none

Odor: slight odor - cow poop

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lentz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 (circled)

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 7.2

Reference Point (description): top of PVC pipe

Water Quality Measurments

Temperature (°C) 14.2

Specific Conductivity (µs/cm) 315.6

Dissolved Oxygen (mg/L) 6.12

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK KB

Sample Date: 9/22/19

Sample Time: 1135 / 1145 PDT:

Base Flow or Storm Event?

Field Filtered Time: 1140 / 1150 PST:
(Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy +59°

HERRERA

Water Quality Sampling

Sample ID: MONM20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	Y
DOC *	HDPE	250 ml	1	HCL	E
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	S
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA73-20190922

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: brown gray

Color: slightly turbid

Odor: bad sulfury

Sheen: slightly

Floatables: yes lots

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 14.6

Specific Conductivity (µs/cm) 280.7

Dissolved Oxygen (mg/L) 9.85

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + KB

Sample Date: 09/22/19 **Sample Time:** 1025 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1030 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy + 61°

Water Quality Sampling

Sample ID: SEIMN 20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: clear

Odor: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Lewis **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.5 inches / 10.79 ft

Reference Point (description): Measure from Top of bolt

Water Quality Measurments

Temperature (°C) 12.7

Specific Conductivity (µs/cm) 115.7

Dissolved Oxygen (mg/L) 10.34

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/22/19 **Sample Time:** 1110 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1115 PST:

(Must filter within 15 minutes of collection)

SITE ID: Seims

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 61° raining

Water Quality Sampling

Sample ID: Seims-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lantz **Signature:**

Date Checked: 9/22/19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.30

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.4

Specific Conductivity (µs/cm) 115.7

Dissolved Oxygen (mg/L) 10.06

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB, GK

Sample Date: 9/22/19 **Sample Time:** 0910 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 0915 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSM [redacted]

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Rainy 59°

Water Quality Sampling

Sample ID: TOSM12019 0922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: V turbid brown

Color:

Odor: no

Sheen: no

Floatables: yes

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J Cowton **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): SG 0.81

Reference Point (description):

Water Quality Measurments

Temperature (°C) 16.9

Specific Conductivity (µs/cm) 2252.1

Dissolved Oxygen (mg/L) 9.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 9/22/19 **Sample Time:** 925 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 930 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 59° raining

Water Quality Sampling

Sample ID: TOSMO-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Z. Lentz **Signature:**

Date Checked: 11-22-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.57

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.8

Specific Conductivity (µs/cm) 268.4

Dissolved Oxygen (mg/L) 10.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mags

Sample Date: 09/22/19 **Sample Time:** 1030 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1035 PST:

(Must filter within 15 minutes of collection)

SITE ID: Tylmi

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60° raining

Water Quality Sampling

Sample ID: Tylmi-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:	
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	slightly turbid
Color:	none
Odor:	none
Sheen:	none
Floatables:	none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T Lautz **Signature:**

Date Checked: 11-24-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020)
- YSI Pro DSS 1
- YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.52

Reference Point (description): top of downstream culvert

Water Quality Measurments

Temperature (°C) 14.8

Specific Conductivity (µs/cm) 246.3

Dissolved Oxygen (mg/L) 9.28

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 09/22/19 **Sample Time:** 0945 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0950 PST:

(Must filter within 15 minutes of collection)

SITE ID: Tylmo

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 59° raining

Water Quality Sampling

Sample ID: Tylmo-20190922

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	no
DOC *	HDPE	250 ml	1	HCL	↓
Fecal Col. Bact.	HDPE	250 ml	1	EDTA	
T. Phosphorous	HDPE	250 ml	1	H_2SO_4	
T. Nitrogen	HDPE	250 ml	1	H_2SO_4	
Diss. Cu and Zn *	HDPE	250 ml	1	HNO3	
Hardness, Total Cu and Zn	HDPE	500 ml	1	HNO_3	

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: turbid

Color: light brown

Odor: none

Sheen: none

Floatables: light bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Lentz **Signature:**

Date Checked: 11-12-19 **Time:**

Data Entered into Database? YES NO **initials:**

Date Entered: **Time:**

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.75

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 14.1

Specific Conductivity (µs/cm) 202.8

Dissolved Oxygen (mg/L) 9.98

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/18/19 Page 1 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/22/19 /All locations, QA73 (MONM) Lab Ref No 1909-241

date 11/22/19

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / SM 2540D	NA	**NA**	3	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	114	**±20**	1	**≤ 25**	20	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	4	**≤ 25**	46	**≤ 25**	OK	FLAG MONM J DUE TO FIELD DUPE EXCEEDANCE.
Hardness	OK / SM 2340B	NA	**NA**	2	**≤180**	≤1.0 mg/L 1.0 mg/L	105, 103	**±25**	104, MS/MSD 1	**±15**	1	**≤ 20**	10	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	2	**≤28**	≤1.0 mg/L 1.0 mg/L	96	**±25**	100	**±15**	D = 0.06	**≤ 20**	17	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	8	**≤28**	≤0.01 mg/L 0.01 mg/L	96	**±25**	100	**±20**	D = 0.002	**≤ 20**	2	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	11	**≤28**	≤0.1 mg/L 0.1 mg/L	74-129	**±25**	92-110	**±20**	NC, 0-7, D=0.07	**≤ 20**	D = 0.05, D=0.01	**≤ 20**	OK	NONE. NO FLAG FOR SLIGHT MS EXCEEDANCE.

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

Data Quality Assurance Worksheet

By J. Brown

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/18/19 Page 2 of 2

Laboratory/Parameters: OnSite Environmental: TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 9/22/19 /All locations, QA73 (MONM) Lab Ref No 1909-241

date 11/22/19

Parameter	Completeness/ Methodology	Pre-preservation Holding Times (minutes)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total Copper	OK/ EPA 200.8	NA	**NA**	2, 3	**≤180**	≤1.0 µg/L 1.0 µg/L	96-97	**±25**	NR	**±15**	D=0.08, D=0.05 MS/MSD 1, 1	**≤ 20**	D = 0.2	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	2, 3	**≤180**	≤5.0 µg/L 5.0 µg/L	93-98	**±25**	NR	**±15**	D=0.08, D=0.2 MS/MSD 0, 1	**≤ 20**	D = 0	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	85-95	**±25**	NR	**±15**	NC, MS/MSD 8, 7	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	90-101	**±25**	NR	**±15**	NC, MS/MSD 2, 10	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	29, 15	**≤ 35**	0	**≤ 50**	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled; NR – not reported

APPENDIX G

Data Validation Memorandum for Water Quality Monitoring

Herrera Environmental Consultants, Inc.

Internal Memorandum

Date: December 11, 2019

To: Project File 14-05806-019

Copy To:

From: Gina Catarra

Subject: Data Quality Assurance Review of the Redmond Paired Watershed Stormwater Retrofit Effectiveness Water Quality Monitoring Data

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This memorandum presents a review of data quality for 252 water samples (including 18 field duplicates, 2 filter blanks, and 1 transfer blank) collected for the Redmond Paired Watershed Stormwater Retrofit Effectiveness Study between October 16, 2018 and September 22, 2019. Onsite Environmental, Inc., of Redmond, Washington analyzed the samples for:

- Total suspended solids (TSS) by Standard Method 2540D
- Turbidity by EPA method 180.1
- Hardness by Standard Method 2340B
- Dissolved organic carbon (DOC) by Standard Method 5310B
- Total phosphorus by EPA method 365.1
- Total and dissolved metals (copper and zinc) by EPA method 200.8.

In addition, AmTest Inc., of Kirkland, Washington analyzed the samples for:

- Total nitrogen (total Kjeldahl nitrogen [TKN] and nitrate + nitrite nitrogen) by Standard Method 4500-N and 4500-NO3, respectively
- Fecal coliform by Standard Method 9222D.

Results for the following samples were validated.

Date Collected	Lab SDG	Samples Collected	QC Samples Collected
10/16/18	1810-212	All 14 stations	1 field duplicate
10/25/18	1810-329	All 14 stations	1 field duplicate
10/27/18	1810-346	All stations, except 3 noted below	1 field duplicate
11/01/18	1811-006	COLM SEIMN, SEIMS	None
11/26/18	1811-213	All 14 stations	1 field duplicate
12/09/18	1812-088	All 14 stations	1 field duplicate
12/11/18	1812-108	All 14 stations	1 field duplicate
12/17/18	1812-175	All 14 stations	1 field duplicate
12/18/18	1812-262	All 14 stations	1 field duplicate
1/15/19	1901-112	All 14 stations	1 field duplicate
1/22/19	1901-184	All 14 stations	1 field duplicate
2/01/19	1902-005	All 14 stations	1 field duplicate and 1 filter blank
3/11/19	1903-106	All 14 stations	1 field duplicate and 1 transfer blank
4/26/16	1904-308	All 14 stations	1 field duplicate and 1 filter blank
7/10/19	1907-114	All 14 stations	1 field duplicate
9/15/19	1909-152	All 14 stations	1 field duplicate
9/17/19	1909-169	All 14 stations	1 field duplicate
9/20/19	1909-227	All 14 stations	1 field duplicate
9/22/19	1909-241	All 14 stations	1 field duplicate

The laboratory's performance was reviewed in accordance with quality control (QC) criteria established in the *Redmond Paired Watershed Study Quality Assurance Project Plan* (QAPP) (Herrera 2015), by the laboratory, and in the specified methods.

Quality control data summaries submitted by the laboratory were reviewed; raw data were not submitted by the laboratory. Data Quality Assurance Worksheets were completed for each laboratory report and are included as an Attachment to this memorandum. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by definitions of data qualifiers.

Custody, Preservation, Holding Times, and Completeness—Acceptable with Qualification

The samples were properly preserved and sample custody was maintained from sample collection to receipt at the laboratory. Samples were analyzed within the required method holding times, with the exception noted below. The laboratory reports were complete and contained results for all samples and tests requested on the chain-of-custody (COC) forms.

The holding time (1 day) was exceeded by 1 days for all samples collected on 10/27/18 for fecal coliform bacteria analysis. Samples were qualified as estimated (flagged J) due to the holding time exceedance, as shown in the table below.

Date Collected	Lab SDG	Sample Location	Parameter	Reason for Qualification	Flag
10/27/18	1810-346	All locations collected 10/27/18	Fecal coliform bacteria	Holding time exceedance	J

Laboratory Reporting Limits—Acceptable

The laboratory reporting limits met those established in the QAPP. No data were qualified based on laboratory reporting limits.

Method Blank Analysis—Acceptable

Method blanks were analyzed at the required frequency. Method blanks did not contain levels of target analytes above the laboratory reporting limits.

Filter Blank Analysis—Acceptable with Qualification

Filter blanks were collected on 2/01/19 and 4/26/19, and analyzed for DOC and dissolved copper and zinc, as required by the QAPP. With the exceptions noted below, the filter blanks did not contain levels of target analytes above the laboratory reporting limits.

For the filter blank collected on 2/01/19, dissolved copper (3.2 µg/L) was detected above the reporting limit (1.0 µg/L). Dissolved copper was detected in seven associated project samples (see table below) above the reporting limit but less than 5 times the filter blank result. All other samples were non-detected for dissolved copper. The dissolved copper results for samples with detected concentrations collected on 2/01/19 were qualified as estimated (flagged J) due to filter blank exceedance, as shown in the table below.

For the filter blank collected on 4/26/19, dissolved copper (2.9 µg/L) was detected above the reporting limit (1.0 µg/L). Dissolved copper was detected in four associated project samples (see table below) above the reporting limit but less than 5 times the filter blank result. All other samples were non-detected for dissolved copper. The dissolved copper results for samples with detected concentrations collected on 4/26/19 were qualified as estimated (flagged J) due to filter blank exceedance, as shown in the table below.

Date Collected	Lab SDG	Sample Location	Parameter	Reason for Qualification	Flag
2/01/19	1902-005	COUMI	Dissolved copper	Filter blank exceedance	J
2/01/19	1902-005	COUMO	Dissolved copper	Filter blank exceedance	J
2/01/19	1902-005	MONMS	Dissolved copper	Filter blank exceedance	J
2/01/19	1902-005	TOSMI	Dissolved copper	Filter blank exceedance	J
2/01/19	1902-005	TOSMO	Dissolved copper	Filter blank exceedance	J
2/01/19	1902-005	TYLMI	Dissolved copper	Filter blank exceedance	J
2/01/19	1902-005	TYLMO	Dissolved copper	Filter blank exceedance	J
4/26/19	1904-308	MONMN	Dissolved copper	Filter blank exceedance	J
4/26/19	1904-308	TOSMI	Dissolved copper	Filter blank exceedance	J
4/26/19	1904-308	TYLMI	Dissolved copper	Filter blank exceedance	J
4/26/19	1904-308	TYLMO	Dissolved copper	Filter blank exceedance	J

Transfer Blank Analysis—Acceptable with Qualification

A transfer blank was collected on 3/11/19 and analyzed for all parameters, as required by the QAPP. With the exceptions noted below, the transfer blank did not contain levels of target analytes above the laboratory reporting limits.

For the transfer blank collected on 3/11/19, dissolved copper (3.2 µg/L) was detected above the laboratory reporting limits. Data were qualified as estimated (flagged J) for dissolved copper when detected above the reporting limits but less than 5 times the transfer blank result, as shown in the table below.

Date Collected	Lab SDG	Sample Location	Parameter	Reason for Qualification	Flag
3/11/19	1903-106	COUMI	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	COUMO	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	MONMS	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	MONMN	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	MONM	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	TOSMI	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	TOSMO	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	TYLMI	Dissolved copper	Transfer blank exceedance	J
3/11/19	1903-106	TYLMO	Dissolved copper	Transfer blank exceedance	J

Laboratory Control Sample Analysis—Acceptable

Laboratory control samples (LCS) were analyzed with project samples for TSS, hardness, DOC, total phosphorus, and total nitrogen at the required frequency. The percent recovery values for all parameters met the criteria established in the QAPP.

Matrix Spike Analysis—Acceptable with Qualification

Matrix spike samples were analyzed for hardness, DOC, total phosphorus, total nitrogen, total copper and zinc, and dissolved copper and zinc. The percent recovery values for all parameters met the control limits established in the QAPP, with the exceptions noted below.

The matrix spike recoveries for samples QA58 and SEIMS collected on 12/11/18 were below (69 and 74 percent, respectively) the 75 to 125 percent criteria for dissolved copper. Because dissolved copper was not detected in either sample QA58 or SEIMS, both samples were qualified as estimated detection limits (flagged UJ), due to a potentially low bias.

Date Collected	Lab SDG	Sample Location	Parameter	Reason for Qualification	Flag
12/11/18	1812-108	QA58	Dissolved copper	Low matrix spike recovery	UJ
12/11/18	1812-108	SEIMS	Dissolved copper	Low matrix spike recovery	UJ

Laboratory Duplicate Analysis—Acceptable with Qualification

Laboratory duplicate samples were analyzed for all parameters. The relative percent difference (RPD) was calculated for each analyte where both duplicate values were greater than five times the reporting limit (RL). The difference between duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the duplicate. The RPD values or difference values met the control limits established by the laboratory or specified method, with the exceptions noted below.

As shown in the table below, several laboratory duplicate RPD values did not meet the criteria established in the QAPP. The sample was qualified as estimated (flagged J) due to the laboratory duplicate exceedance.

Date Collected	Lab SDG	Sample Location	Parameter	Reason for Qualification	Flag
10/27/18	1810-346	EVALSS	Fecal coliform	Laboratory duplicate exceedance	J
11/26/18	1811-213	QA56	Fecal coliform	Laboratory duplicate exceedance	J
12/09/18	1812-088	TOSMI	TSS	Laboratory duplicate exceedance	J
12/17/18	1812-175	COLM	Fecal coliform	Laboratory duplicate exceedance	J
12/17/18	1812-175	QA59	Fecal coliform	Laboratory duplicate exceedance	J
12/28/18	1812-262	COLM	Turbidity	Laboratory duplicate exceedance	J
1/22/19	1901-184	COLM	Fecal coliform	Laboratory duplicate exceedance	J
3/11/19	1903-106	COUM	Fecal coliform	Laboratory duplicate exceedance	J
9/15/19	1909-152	SEIMS	Fecal coliform	Laboratory duplicate exceedance	J

Field Duplicate Analysis—Acceptable with Qualification

Field duplicates were analyzed for all parameters at the required frequency (18 field duplicates analyzed in total). The RPD was calculated for each analyte where both the values were greater than five times the RL. The difference between the duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the field duplicate. With the exceptions noted below, the RPD values or difference values met the control limits established in the QAPP.

As shown in the table below, several field duplicate values did not meet the criteria established in the QAPP. The sample and associated duplicate were qualified as estimated (flagged J) due to the field duplicate exceedance.

Date Collected	Lab SDG	Sample Location	Duplicate ID	Parameter	Reason for Qualification	Flag
10/25/18	1810-329	MONMN	QA54	Turbidity	Field duplicate exceedance	J
10/27/18	1810-346	TOSMO	QA55	TSS, turbidity, TP and TKN	Field duplicate exceedance	J
11/26/18	1811-213	TYLMO	QA56	TSS, turbidity, hardness, TP, TKN, total copper, and total zinc	Field duplicate exceedance	J
12/11/18	1812-108	SEIMS	QA58	Turbidity	Field duplicate exceedance	J
12/17/18	1812-175	COUMI	QA59	Turbidity	Field duplicate exceedance	J
12/28/18	1812-262	EVALSS	QA6	Fecal coliform	Field duplicate exceedance	J
3/11/19	1903-106	COUMO	QA66	Fecal coliform	Field duplicate exceedance	J
7/10/19	1907-114	MONM	QA69	Turbidity	Field duplicate exceedance	J
9/20/19	1909-227	MONMN	QA48	Fecal coliform	Field duplicate exceedance	J

DEFINITION OF DATA QUALIFIERS

The following are data qualifier definitions applied for this project.

Data Qualifier	Definition
J	Value is an estimate based on analytical results
R	Value is rejected based on analytical results
U	Value is below the reporting limit
UJ	Value is below the reporting limit and is an estimate based on analytical results

REFERENCES

Herrera. 2015. Redmond Paired Watershed Study Quality Assurance Project Plan. Prepared by Herrera Environmental Consultants, Inc., Seattle, Washington. December 31.

APPENDIX H

Summary Statistics for Pollutant Concentrations Measured in Storm Event and Base Flow Samples

Table H-1. Summary Statistics for Total Suspended Solids Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (mg/L)	25th Percentile (mg/L)	Median (mg/L)	75th Percentile (mg/L)	Maximum (mg/L)	Interquartile Range (mg/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	3.6	5.2	6.9	7.1	7.2	1.9	100%	NA
EVAMS	4	3.6	3.8	4.2	6.9	9.4	3.1	100%	NA
MONM	4	1.4	1.5	1.6	1.9	2.2	0.4	100%	NA
MONMN	4	1.8	2.0	2.2	17.1	32.0	15.1	100%	NA
MONMS	4	1.0	4.0	8.0	9.5	10.0	5.5	100%	NA
TOSMO	4	1.0	1.4	1.9	10.5	19.0	9.1	100%	NA
TOSMI	4	1.2	1.7	2.4	5.7	8.8	4.0	100%	NA
COLM	4	0.5	0.5	0.5	1.5	2.4	1.0	25%	NA
SEIMN	4	3.8	4.0	4.6	6.2	7.4	2.2	100%	NA
SEIMS	4	1.4	2.2	3.8	18.3	32.0	16.1	100%	NA
COUMO	4	1.0	1.8	3.7	4.9	5.0	3.1	100%	NA
COUMI	4	10.0	11.0	15.0	21.0	24.0	10.0	100%	NA
TYLMO	4	1.4	1.6	3.6	7.7	10.0	6.1	100%	NA
TYLMI	4	2.4	2.6	3.3	4.9	6.0	2.3	100%	NA
Storm Event Samples									
EVALSS	14	3.6	12.0	25.0	39.0	84.0	27.0	100%	NA
EVAMS	14	2.6	6.2	13.0	17.0	55.0	10.8	100%	NA
MONM	14	3.2	8.6	16.0	28.0	190.0	19.4	100%	NA
MONMN	14	2.8	8.6	18.0	29.0	200.0	20.4	100%	NA
MONMS	14	1.8	2.6	4.0	5.4	8.8	2.8	100%	NA
TOSMO	14	4.4	32.0	78.0	110.0	990.0	78.0	100%	NA
TOSMI	14	3.0	24.0	90.5	140.0	280.0	116.0	100%	NA
COLM	14	0.5	0.5	0.8	1.6	6.6	1.1	50%	NA
SEIMN	14	10.0	20.0	39.5	56.0	120.0	36.0	100%	NA
SEIMS	14	5.4	14.0	27.5	32.0	140.0	18.0	100%	NA
COUMO	14	2.8	15.0	26.0	51.0	130.0	36.0	100%	NA
COUMI	14	20.0	47.0	55.0	120.0	180.0	73.0	100%	NA
TYLMO	14	5.0	21.0	34.0	47.0	130.0	26.0	100%	NA
TYLMI	14	4.2	9.2	12.0	18.0	53.0	8.8	100%	NA

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-2. Summary Statistics for Total Turbidity Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (NTU)	25th Percentile (NTU)	Median (NTU)	75th Percentile (NTU)	Maximum (NTU)	Interquartile Range (NTU)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	1.6	2.4	3.3	3.6	3.7	1.3	100%	NA
EVAMS	4	2.2	2.4	2.8	4.0	5.0	1.6	100%	NA
MONM	4	1.5	1.5	1.6	1.8	1.9	0.3	100%	NA
MONMN	4	1.3	1.4	1.7	6.4	11.0	5.0	100%	NA
MONMS	4	1.1	2.1	3.3	4.3	5.0	2.2	100%	NA
TOSMO	4	1.0	1.2	1.9	5.2	8.0	4.0	100%	NA
TOSMI	4	1.0	1.1	1.9	3.7	4.9	2.6	100%	NA
COLM	4	0.5	0.5	0.7	1.2	1.6	0.7	100%	NA
SEIMN	4	2.5	2.5	2.6	3.3	3.8	0.8	100%	NA
SEIMS	4	1.7	2.2	2.8	7.0	11.0	4.8	100%	NA
COUMO	4	0.7	1.0	1.5	2.7	3.7	1.7	100%	NA
COUMI	4	4.4	5.3	6.4	7.0	7.3	1.7	100%	NA
TYLMO	4	1.8	2.4	3.4	4.9	5.8	2.5	100%	NA
TYLMI	4	1.3	1.8	2.5	2.8	3.0	1.0	100%	NA
Storm Event Samples									
EVALSS	14	2.6	5.1	8.2	18.0	30.0	12.9	100%	NA
EVAMS	14	1.6	3.3	7.4	9.7	25.0	6.4	100%	NA
MONM	14	2.2	6.5	10.5	16.0	81.0	9.5	100%	NA
MONMN	14	1.5	5.1	10.0	17.0	91.0	11.9	100%	NA
MONMS	14	1.9	2.5	3.1	4.4	6.6	1.9	100%	NA
TOSMO	14	2.7	11.0	33.0	51.0	270.0	40.0	100%	NA
TOSMI	14	2.2	9.6	26.0	44.0	73.0	34.4	100%	NA
COLM	14	0.5	0.8	1.2	1.3	3.7	0.5	100%	NA
SEIMN	14	6.3	9.0	20.0	25.0	62.0	16.0	100%	NA
SEIMS	14	2.4	5.8	10.5	14.0	40.0	8.2	100%	NA
COUMO	14	2.1	11.0	14.5	28.0	48.0	17.0	100%	NA
COUMI	14	11.0	25.0	28.5	61.0	80.0	36.0	100%	NA
TYLMO	14	3.6	13.0	19.0	29.0	75.0	16.0	100%	NA
TYLMI	14	2.7	4.6	8.9	10.0	33.0	5.4	100%	NA

NTU: Nephelometric Turbidity Unit

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-3. Summary Statistics for Total Hardness Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (mg/L)	25th Percentile (mg/L)	Median (mg/L)	75th Percentile (mg/L)	Maximum (mg/L)	Interquartile Range (mg/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	83	86	90	95	99	10	100%	NA
EVAMS	4	85	91	97	104	110	14	100%	NA
MONM	4	80	89	99	110	120	21	100%	NA
MONMN	4	69	76	89	103	110	28	100%	NA
MONMS	4	130	135	140	160	180	25	100%	NA
TOSMO	4	110	115	120	125	130	10	100%	NA
TOSMI	4	130	135	140	150	160	15	100%	NA
COLM	4	11	13	15	16	16	4	100%	NA
SEIMN	4	28	29	40	51	53	22	100%	NA
SEIMS	4	45	47	52	56	57	9	100%	NA
COUMO	4	110	115	125	130	130	15	100%	NA
COUMI	4	140	145	150	160	170	15	100%	NA
TYLMO	4	74	78	87	95	98	17	100%	NA
TYLMI	4	87	91	98	110	120	19	100%	NA
Storm Event Samples									
EVALSS	14	71	76	80	87	95	11	100%	NA
EVAMS	14	72	82	84	95	100	13	100%	NA
MONM	14	51	67	78	85	120	18	100%	NA
MONMN	14	42	55	67	79	110	24	100%	NA
MONMS	14	64	83	105	140	150	57	100%	NA
TOSMO	14	42	55	79	98	120	43	100%	NA
TOSMI	14	23	30	59	82	120	52	100%	NA
COLM	14	11	12	13	14	18	2	100%	NA
SEIMN	14	24	27	32	45	53	18	100%	NA
SEIMS	14	39	42	47	55	62	13	100%	NA
COUMO	14	26	52	66	88	130	36	100%	NA
COUMI	14	56	69	83	130	170	61	100%	NA
TYLMO	14	23	28	37	58	89	30	100%	NA
TYLMI	14	27	37	59	85	110	48	100%	NA

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-4. Summary Statistics for Dissolved Organic Carbon Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (mg/L)	25th Percentile (mg/L)	Median (mg/L)	75th Percentile (mg/L)	Maximum (mg/L)	Interquartile Range (mg/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	2.8	3.0	3.6	4.5	4.9	1.5	100%	NA
EVAMS	4	2.9	3.2	4.0	5.1	5.7	2.0	100%	NA
MONM	4	3.2	3.3	3.9	5.0	5.6	1.7	100%	NA
MONMN	4	3.6	3.7	4.1	4.9	5.3	1.2	100%	NA
MONMS	4	4.1	4.9	5.7	6.7	7.6	1.9	100%	NA
TOSMO	4	1.8	2.3	2.8	3.2	3.4	0.9	100%	NA
TOSMI	4	1.9	2.3	3.0	3.7	4.0	1.5	100%	NA
COLM	4	7.2	9.6	13.0	14.5	15.0	4.9	100%	NA
SEIMN	4	1.4	2.1	4.7	7.1	7.6	5.0	100%	NA
SEIMS	4	3.7	3.8	4.5	5.4	5.7	1.6	100%	NA
COUMO	4	2.8	2.9	3.6	4.3	4.5	1.4	100%	NA
COUMI	4	2.9	3.2	3.8	4.2	4.3	1.0	100%	NA
TYLMO	4	3.3	3.8	4.5	4.7	4.7	0.9	100%	NA
TYLMI	4	1.8	3.0	5.0	5.8	5.8	2.8	100%	NA
Storm Event Samples									
EVALSS	14	2.4	3.7	4.6	5.3	10.0	1.6	100%	NA
EVAMS	14	3.1	4.1	4.8	6.1	12.0	2.0	100%	NA
MONM	14	4.7	5.2	5.9	6.6	11.0	1.4	100%	NA
MONMN	14	4.5	4.9	5.2	6.7	14.0	1.8	100%	NA
MONMS	14	4.6	4.9	6.0	7.2	8.9	2.3	100%	NA
TOSMO	14	2.9	3.9	4.5	5.9	8.3	2.0	100%	NA
TOSMI	14	3.0	4.6	5.2	6.0	8.8	1.4	100%	NA
COLM	14	7.7	12.0	13.0	15.0	17.0	3.0	100%	NA
SEIMN	14	2.1	3.5	6.7	7.3	12.0	3.8	100%	NA
SEIMS	14	4.2	5.4	6.6	8.3	15.0	2.9	100%	NA
COUMO	14	3.8	4.2	5.3	7.0	14.0	2.8	100%	NA
COUMI	14	3.9	4.1	4.9	6.8	11.0	2.7	100%	NA
TYLMO	14	3.2	3.7	5.1	5.9	6.4	2.2	100%	NA
TYLMI	14	3.5	5.1	5.5	6.8	9.3	1.7	100%	NA

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-5. Summary Statistics for Fecal Coliform Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (CFU/100 mL)	25th Percentile (CFU/100 mL)	Median (CFU/100 mL)	75th Percentile (CFU/100 mL)	Maximum (CFU/100 mL)	Interquartile Range (CFU/100 mL)	Percent Detected	Percent Exceeding Standard [a]
Base Flow Samples									
EVALSS	4	5	7	51	122	150	116	100%	0%
EVAMS	4	6	7	20	86	140	80	100%	0%
MONM	4	16	28	240	530	620	502	100%	50%
MONMN	4	1	4	34	130	200	126	75%	0%
MONMS	4	2	13	87	200	250	187	100%	25%
TOSMO	4	13	56	109	125	130	70	100%	0%
TOSMI	4	20	29	179	355	390	326	100%	50%
COLM	4	1	4	9	17	24	13	75%	0%
SEIMN	4	1	1	3	167	330	166	75%	25%
SEIMS	4	12	13	15	68	120	56	100%	0%
COUMO	4	34	92	150	300	450	208	100%	25%
COUMI	4	13	16	84	155	160	140	100%	0%
TYLMO	4	5	12	22	48	70	37	100%	0%
TYLMI	4	1	9	94	450	730	441	75%	25%
Storm Event Samples									
EVALSS	14	15	46	115	180	1,400	134	100%	21%
EVAMS	14	9	13	57	480	2,000	467	100%	36%
MONM	14	45	82	180	520	1,500	438	100%	50%
MONMN	14	1	33	61	460	840	427	93%	43%
MONMS	14	1	90	115	240	660	150	93%	29%
TOSMO	14	110	420	760	1,300	1,600	880	100%	86%
TOSMI	14	440	600	1,250	1,800	2,600	1,200	100%	100%
COLM	14	1	24	45	130	140	106	93%	0%
SEIMN	14	10	50	128	480	880	430	100%	36%
SEIMS	14	15	44	113	200	1,400	156	100%	14%
COUMO	14	62	320	1,100	1,200	5,000	880	100%	79%
COUMI	14	31	100	325	2,300	7,800	2,200	100%	71%
TYLMO	14	98	300	480	720	2,600	420	100%	79%
TYLMI	14	1	27	225	540	840	513	93%	50%

CFU/100 mL: Coliform forming units per 100 milliliters

All summary statistics were calculated using values of half the reporting limit for non-detect values.

[a] Percentage of samples exceeding recreational use criteria for bacteria from Washington Adminstrative Code 173-201A.

Table H-6. Summary Statistics for Total Phosphorus Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (mg/L)	25th Percentile (mg/L)	Median (mg/L)	75th Percentile (mg/L)	Maximum (mg/L)	Interquartile Range (mg/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	0.024	0.026	0.029	0.037	0.043	0.011	100%	NA
EVAMS	4	0.015	0.017	0.024	0.032	0.036	0.015	100%	NA
MONM	4	0.024	0.028	0.036	0.042	0.042	0.014	100%	NA
MONMN	4	0.028	0.030	0.035	0.089	0.140	0.059	100%	NA
MONMS	4	0.010	0.019	0.041	0.083	0.110	0.064	100%	NA
TOSMO	4	0.057	0.060	0.063	0.066	0.067	0.006	100%	NA
TOSMI	4	0.053	0.057	0.061	0.063	0.065	0.007	100%	NA
COLM	4	0.011	0.013	0.017	0.023	0.025	0.010	100%	NA
SEIMN	4	0.022	0.028	0.036	0.040	0.041	0.013	100%	NA
SEIMS	4	0.030	0.031	0.040	0.069	0.090	0.038	100%	NA
COUMO	4	0.051	0.052	0.063	0.097	0.120	0.045	100%	NA
COUMI	4	0.083	0.107	0.135	0.150	0.160	0.044	100%	NA
TYLMO	4	0.032	0.035	0.045	0.070	0.088	0.035	100%	NA
TYLMI	4	0.020	0.024	0.029	0.033	0.037	0.009	100%	NA
Storm Event Samples									
EVALSS	14	0.027	0.045	0.054	0.069	0.120	0.024	100%	NA
EVAMS	14	0.018	0.027	0.037	0.047	0.860	0.020	100%	NA
MONM	14	0.046	0.056	0.072	0.093	0.410	0.037	100%	NA
MONMN	14	0.037	0.055	0.074	0.086	0.650	0.031	100%	NA
MONMS	14	0.031	0.036	0.041	0.055	0.074	0.019	100%	NA
TOSMO	14	0.053	0.100	0.150	0.180	0.910	0.080	100%	NA
TOSMI	14	0.047	0.073	0.120	0.170	0.320	0.097	100%	NA
COLM	14	0.011	0.017	0.020	0.023	0.036	0.006	100%	NA
SEIMN	14	0.054	0.062	0.100	0.120	0.260	0.058	100%	NA
SEIMS	14	0.043	0.067	0.085	0.094	0.240	0.027	100%	NA
COUMO	14	0.050	0.097	0.100	0.170	0.980	0.073	100%	NA
COUMI	14	0.088	0.140	0.175	0.230	0.370	0.090	100%	NA
TYLMO	14	0.046	0.066	0.095	0.150	0.300	0.084	100%	NA
TYLMI	14	0.043	0.048	0.062	0.069	0.310	0.021	100%	NA

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-7. Summary Statistics for Total Nitrogen Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (mg/L)	25th Percentile (mg/L)	Median (mg/L)	75th Percentile (mg/L)	Maximum (mg/L)	Interquartile Range (mg/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	1.66	1.72	1.83	2.08	2.28	0.36	100%	NA
EVAMS	4	0.78	1.45	2.18	2.37	2.51	0.92	100%	NA
MONM	4	0.06	0.31	0.58	0.70	0.80	0.39	75%	NA
MONMN	4	0.52	0.53	0.64	1.24	1.74	0.70	100%	NA
MONMS	4	0.11	0.34	0.62	0.74	0.79	0.40	75%	NA
TOSMO	4	0.06	0.08	0.45	0.83	0.86	0.74	50%	NA
TOSMI	4	0.92	0.96	1.08	1.27	1.38	0.32	100%	NA
COLM	4	0.11	0.11	0.16	0.40	0.59	0.29	50%	NA
SEIMN	4	0.06	0.28	0.56	0.94	1.27	0.66	75%	NA
SEIMS	4	0.48	0.49	0.54	0.63	0.69	0.14	100%	NA
COUMO	4	0.06	0.08	0.36	0.63	0.64	0.55	50%	NA
COUMI	4	0.11	0.22	0.41	0.50	0.50	0.28	75%	NA
TYLMO	4	0.54	0.58	0.75	0.98	1.07	0.40	100%	NA
TYLMI	4	0.54	0.82	1.15	1.46	1.71	0.64	100%	NA
Storm Event Samples									
EVALSS	14	1.55	1.71	1.86	2.09	2.36	0.38	100%	NA
EVAMS	14	1.69	2.09	2.23	2.38	2.66	0.29	100%	NA
MONM	14	0.62	0.67	0.80	0.93	2.21	0.25	100%	NA
MONMN	14	0.06	0.59	0.74	1.06	3.00	0.47	86%	NA
MONMS	14	0.52	0.54	0.62	0.70	0.82	0.16	100%	NA
TOSMO	14	0.70	0.87	1.06	1.45	2.84	0.58	100%	NA
TOSMI	14	0.65	0.79	1.27	1.56	2.85	0.77	100%	NA
COLM	14	0.11	0.46	0.52	0.63	0.90	0.18	86%	NA
SEIMN	14	0.49	0.54	0.68	0.84	0.89	0.30	100%	NA
SEIMS	14	0.57	0.66	0.86	1.11	3.21	0.44	100%	NA
COUMO	14	0.69	0.86	0.95	1.11	1.45	0.25	100%	NA
COUMI	14	0.50	0.69	1.02	1.49	1.68	0.80	100%	NA
TYLMO	14	0.37	0.58	0.82	0.94	1.69	0.36	100%	NA
TYLMI	14	0.59	0.74	0.99	1.24	2.15	0.50	100%	NA

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Total Nitrogen values were calculated by adding the Total Nitrate + Nitrite and Total Kjeldahl Nitrogen values

Table H-8. Summary Statistics for Nitrate + Nitrite (N+N) Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (mg/L)	25th Percentile (mg/L)	Median (mg/L)	75th Percentile (mg/L)	Maximum (mg/L)	Interquartile Range (mg/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	1.30	1.30	1.40	1.75	2.00	0.45	100%	NA
EVAMS	4	0.57	1.04	1.75	2.00	2.00	0.97	100%	NA
MONM	4	0.09	0.14	0.26	0.38	0.43	0.24	100%	NA
MONMN	4	0.10	0.11	0.18	0.87	1.50	0.76	100%	NA
MONMS	4	0.01	0.02	0.10	0.32	0.48	0.30	75%	NA
TOSMO	4	0.43	0.45	0.50	0.59	0.63	0.14	100%	NA
TOSMI	4	0.79	0.80	0.82	0.85	0.86	0.05	100%	NA
COLM	4	0.01	0.01	0.02	0.05	0.06	0.04	50%	NA
SEIMN	4	0.10	0.13	0.20	0.61	0.97	0.49	100%	NA
SEIMS	4	0.12	0.14	0.21	0.26	0.26	0.12	100%	NA
COUMO	4	0.27	0.28	0.32	0.37	0.37	0.09	100%	NA
COUMI	4	0.06	0.09	0.19	0.30	0.34	0.20	100%	NA
TYLMO	4	0.18	0.24	0.43	0.57	0.58	0.33	100%	NA
TYLMI	4	0.12	0.35	0.68	0.94	1.10	0.59	100%	NA
Storm Event Samples									
EVALSS	14	0.92	1.20	1.40	1.50	1.50	0.30	100%	NA
EVAMS	14	1.10	1.50	1.70	1.80	2.00	0.30	100%	NA
MONM	14	0.14	0.16	0.28	0.31	0.46	0.15	100%	NA
MONMN	14	0.01	0.10	0.26	0.28	2.40	0.18	86%	NA
MONMS	14	0.06	0.09	0.20	0.30	0.33	0.21	100%	NA
TOSMO	14	0.22	0.30	0.52	0.61	0.99	0.31	100%	NA
TOSMI	14	0.15	0.28	0.57	0.89	1.20	0.61	100%	NA
COLM	14	0.01	0.03	0.07	0.08	0.26	0.05	86%	NA
SEIMN	14	0.14	0.14	0.18	0.23	0.51	0.09	100%	NA
SEIMS	14	0.14	0.21	0.23	0.24	0.41	0.03	100%	NA
COUMO	14	0.20	0.30	0.36	0.43	0.59	0.13	100%	NA
COUMI	14	0.13	0.22	0.25	0.31	0.41	0.09	100%	NA
TYLMO	14	0.16	0.18	0.24	0.26	0.43	0.08	100%	NA
TYLMI	14	0.18	0.34	0.50	0.75	1.10	0.41	100%	NA

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Total Nitrogen values were calculated by adding the Total Nitrate + Nitrite and Total Kjeldahl Nitrogen values

Table H-9. Summary Statistics for Total Kjeldahl Nitrogen (TKN) Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (mg/L)	25th Percentile (mg/L)	Median (mg/L)	75th Percentile (mg/L)	Maximum (mg/L)	Interquartile Range (mg/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	0.16	0.22	0.37	0.53	0.58	0.31	100%	NA
EVAMS	4	0.21	0.22	0.37	0.57	0.63	0.35	100%	NA
MONM	4	0.05	0.11	0.32	0.48	0.48	0.37	75%	NA
MONMN	4	0.24	0.32	0.42	0.47	0.50	0.15	100%	NA
MONMS	4	0.31	0.42	0.53	0.65	0.76	0.23	100%	NA
TOSMO	4	0.05	0.08	0.16	0.28	0.33	0.21	50%	NA
TOSMI	4	0.13	0.13	0.23	0.45	0.58	0.32	100%	NA
COLM	4	0.14	0.29	0.50	0.59	0.61	0.29	100%	NA
SEIMN	4	0.05	0.18	0.33	0.43	0.50	0.25	75%	NA
SEIMS	4	0.25	0.29	0.35	0.44	0.53	0.15	100%	NA
COUMO	4	0.05	0.08	0.18	0.31	0.36	0.23	50%	NA
COUMI	4	0.10	0.13	0.21	0.32	0.37	0.19	75%	NA
TYLMO	4	0.24	0.28	0.38	0.47	0.49	0.18	100%	NA
TYLMI	4	0.42	0.42	0.47	0.56	0.61	0.14	100%	NA
Storm Event Samples									
EVALSS	14	0.22	0.41	0.59	0.70	1.44	0.29	100%	NA
EVAMS	14	0.33	0.39	0.57	0.68	1.56	0.29	100%	NA
MONM	14	0.36	0.47	0.53	0.69	1.90	0.22	100%	NA
MONMN	14	0.26	0.41	0.53	0.61	2.20	0.21	100%	NA
MONMS	14	0.23	0.31	0.46	0.49	0.67	0.18	100%	NA
TOSMO	14	0.24	0.38	0.62	0.86	2.62	0.48	100%	NA
TOSMI	14	0.19	0.44	0.67	0.82	1.75	0.38	100%	NA
COLM	14	0.28	0.44	0.49	0.64	0.69	0.20	100%	NA
SEIMN	14	0.31	0.36	0.42	0.52	0.69	0.16	100%	NA
SEIMS	14	0.31	0.45	0.61	0.97	2.98	0.51	100%	NA
COUMO	14	0.21	0.52	0.60	0.80	1.00	0.28	100%	NA
COUMI	14	0.22	0.45	0.70	1.24	1.33	0.79	100%	NA
TYLMO	14	0.19	0.40	0.53	0.69	1.45	0.29	100%	NA
TYLMI	14	0.36	0.42	0.50	0.54	1.05	0.12	100%	NA

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-10. Summary Statistics for Dissolved Copper Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (ug/L)	25th Percentile (ug/L)	Median (ug/L)	75th Percentile (ug/L)	Maximum (ug/L)	Interquartile Range (ug/L)	Percent Detected	Percent Exceeding Standard[a]
Base Flow Samples									
EVALSS	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
EVAMS	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
MONM	4	0.5	0.5	0.5	0.85	1.2	0.4	25%	0%
MONMN	4	0.5	0.5	0.8	1.25	1.4	0.8	50%	0%
MONMS	4	0.5	0.5	0.5	1	1.5	0.5	25%	0%
TOSMO	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
TOSMI	4	0.5	0.8	1.3	1.6	1.7	0.8	75%	0%
COLM	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
SEIMN	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
SEIMS	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
COUMO	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
COUMI	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
TYLMO	4	0.5	0.8	1.15	1.4	1.6	0.6	75%	0%
TYLMI	4	0.5	1.1	1.8	3.5	5.1	2.4	75%	0%
Storm Event Samples									
EVALSS	14	0.5	0.5	0.5	0.5	1.1	0.0	7%	0%
EVAMS	14	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
MONM	14	0.5	0.5	1.2	1.3	1.6	0.8	64%	0%
MONMN	14	0.5	0.5	1.1	1.4	1.6	0.9	64%	0%
MONMS	14	0.5	1.1	1.4	1.8	2.4	0.7	79%	0%
TOSMO	14	0.5	1.7	2.5	2.9	5.0	1.2	86%	0%
TOSMI	14	2.2	2.9	3.5	4.9	10.0	2.0	100%	0%
COLM	14	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
SEIMN	14	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
SEIMS	14	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
COUMO	14	0.5	1.9	2.5	2.8	4.8	0.9	93%	0%
COUMI	14	0.5	1.4	1.8	2.3	3.1	0.9	86%	0%
TYLMO	14	0.5	2.4	3.2	3.7	4.3	1.3	93%	0%
TYLMI	14	0.5	2.4	3.2	4.3	5.9	1.9	93%	0%

µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

[a] Percentage of base flow and storm event samples exceeding acute and chronic freshwater aquatic life protection criteria, respectively, for dissolved copper from Ecology (2016). Criterion were derived using measured hardness at each station (see Table H-3).

Table H-11. Summary Statistics for Total Copper Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (ug/L)	25th Percentile (ug/L)	Median (ug/L)	75th Percentile (ug/L)	Maximum (ug/L)	Interquartile Range (ug/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	NA
EVAMS	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	NA
MONM	4	0.5	0.5	0.5	0.9	1.2	0.4	25%	NA
MONMN	4	0.5	0.5	1.0	1.8	2.2	1.3	50%	NA
MONMS	4	1.0	1.0	1.1	1.4	1.7	0.4	100%	NA
TOSMO	4	0.5	0.5	0.8	1.4	1.7	0.9	50%	NA
TOSMI	4	0.5	0.9	1.6	2.4	2.7	1.5	75%	NA
COLM	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	NA
SEIMN	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	NA
SEIMS	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	NA
COUMO	4	0.5	0.5	0.5	1.0	1.4	0.5	25%	NA
COUMI	4	0.5	1.0	1.6	1.8	1.9	0.8	75%	NA
TYLMO	4	0.5	0.8	1.2	2.3	3.3	1.5	75%	NA
TYLMI	4	1.7	2.0	2.9	9.8	16.0	7.8	100%	NA
Storm Event Samples									
EVALSS	14	0.5	0.5	0.8	1.6	3.2	1.1	50%	NA
EVAMS	14	0.5	0.5	0.5	0.5	2.1	0.0	14%	NA
MONM	14	0.5	1.5	1.9	2.5	7.3	1.0	93%	NA
MONMN	14	0.5	1.4	1.9	2.6	7.5	1.2	93%	NA
MONMS	14	0.5	1.5	1.8	2.2	2.6	0.7	93%	NA
TOSMO	14	1.7	3.4	7.0	11.0	22.0	7.6	100%	NA
TOSMI	14	2.6	5.8	7.9	13.0	23.0	7.2	100%	NA
COLM	14	0.5	0.5	0.5	0.5	1.2	0.0	21%	NA
SEIMN	14	0.5	1.2	1.5	2.0	3.9	0.8	93%	NA
SEIMS	14	0.5	0.5	0.5	0.5	6.7	0.0	21%	NA
COUMO	14	1.3	3.7	4.3	7.2	13.0	3.5	100%	NA
COUMI	14	0.5	3.6	4.0	7.0	9.6	3.4	93%	NA
TYLMO	14	2.7	4.8	6.5	7.6	23.0	2.8	100%	NA
TYLMI	14	2.7	3.8	4.3	5.2	9.9	1.4	100%	NA

µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-12. Summary Statistics for Dissolved Zinc Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (ug/L)	25th Percentile (ug/L)	Median (ug/L)	75th Percentile (ug/L)	Maximum (ug/L)	Interquartile Range (ug/L)	Percent Detected	Percent Exceeding Standard[a]
Base Flow Samples									
EVALSS	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
EVAMS	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
MONM	4	2.5	3.9	6.3	7.4	7.4	3.5	75%	0%
MONMN	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
MONMS	4	2.5	2.5	2.5	4.3	6.1	1.8	25%	0%
TOSMO	4	2.5	5.8	10.6	61.0	110.0	55.2	75%	0%
TOSMI	4	9.4	13.7	21.0	56.5	89.0	42.8	100%	0%
COLM	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
SEIMN	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
SEIMS	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
COUMO	4	2.5	3.8	5.9	8.2	9.8	4.4	75%	0%
COUMI	4	2.5	2.5	2.5	8.3	14.0	5.8	25%	0%
TYLMO	4	2.5	2.5	2.5	4.7	6.8	2.2	25%	0%
TYLMI	4	2.5	2.5	4.1	15.8	26.0	13.3	50%	0%
Storm Event Samples									
EVALSS	14	2.5	2.5	2.5	2.5	7.3	0.0	7%	0%
EVAMS	14	2.5	2.5	2.5	2.5	14.0	0.0	7%	0%
MONM	14	2.5	7.6	8.5	10.0	17.0	2.4	93%	0%
MONMN	14	2.5	2.5	5.4	6.5	46.0	4.0	57%	0%
MONMS	14	2.5	2.5	2.5	2.5	12.0	0.0	21%	0%
TOSMO	14	7.0	8.1	12.0	43.0	80.0	34.9	100%	7%
TOSMI	14	15.0	24.0	31.0	96.0	210.0	72.0	100%	36%
COLM	14	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
SEIMN	14	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
SEIMS	14	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
COUMO	14	5.1	13.0	17.0	27.0	120.0	14.0	100%	0%
COUMI	14	2.5	5.5	12.0	28.0	54.0	22.5	79%	0%
TYLMO	14	2.5	5.2	5.7	9.4	1000.0	4.2	79%	14%
TYLMI	14	2.5	2.5	3.9	5.4	30.0	2.9	50%	0%

µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

[a] Percentage of base flow and storm event samples exceeding acute and chronic freshwater aquatic life protection criteria, respectively, for dissolved zinc from Ecology (2016). Criterion were derived using measured hardness at each station (see Table H-3).

Table H-13. Summary Statistics for Total Zinc Concentrations Measured in Storm Event and Base Flow Samples.

Station	n	Mininum (ug/L)	25th Percentile (ug/L)	Median (ug/L)	75th Percentile (ug/L)	Maximum (ug/L)	Interquartile Range (ug/L)	Percent Detected	Percent Exceeding Standard
Base Flow Samples									
EVALSS	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	NA
EVAMS	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	NA
MONM	4	7.3	7.5	8.2	9.1	9.5	1.6	100%	NA
MONMN	4	2.5	2.5	3.9	13.7	22.0	11.2	50%	NA
MONMS	4	2.5	2.5	4.1	6.4	7.1	3.9	50%	NA
TOSMO	4	2.5	6.8	22.5	82.0	130.0	75.3	75%	NA
TOSMI	4	9.2	16.1	41.0	78.0	97.0	61.9	100%	NA
COLM	4	2.5	2.5	2.5	3.8	5.1	1.3	25%	NA
SEIMN	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	NA
SEIMS	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	NA
COUMO	4	8.1	10.1	12.0	13.0	14.0	3.0	100%	NA
COUMI	4	14.0	15.5	17.0	18.0	19.0	2.5	100%	NA
TYLMO	4	2.5	2.5	4.4	13.7	21.0	11.2	50%	NA
TYLMI	4	2.5	6.8	13.0	42.5	70.0	35.8	75%	NA
Storm Event Samples									
EVALSS	14	2.5	2.5	2.5	6.2	12.0	3.7	43%	NA
EVAMS	14	2.5	2.5	2.5	2.5	22.0	0.0	14%	NA
MONM	14	11.0	14.0	21.0	23.0	95.0	9.0	100%	NA
MONMN	14	2.5	6.9	11.0	19.0	77.0	12.1	93%	NA
MONMS	14	2.5	2.5	5.5	6.3	21.0	3.8	57%	NA
TOSMO	14	16.0	40.0	51.0	160.0	300.0	120.0	100%	NA
TOSMI	14	41.0	56.0	88.5	240.0	430.0	184.0	100%	NA
COLM	14	2.5	2.5	2.5	2.5	2.5	0.0	0%	NA
SEIMN	14	2.5	2.5	2.5	2.5	6.3	0.0	21%	NA
SEIMS	14	2.5	2.5	4.0	6.8	30.0	4.3	50%	NA
COUMO	14	12.0	33.0	49.5	60.0	140.0	27.0	100%	NA
COUMI	14	9.7	33.0	61.0	70.0	120.0	37.0	100%	NA
TYLMO	14	5.9	19.0	25.0	43.0	1700.0	24.0	100%	NA
TYLMI	14	6.3	9.3	12.5	15.0	45.0	5.7	100%	NA

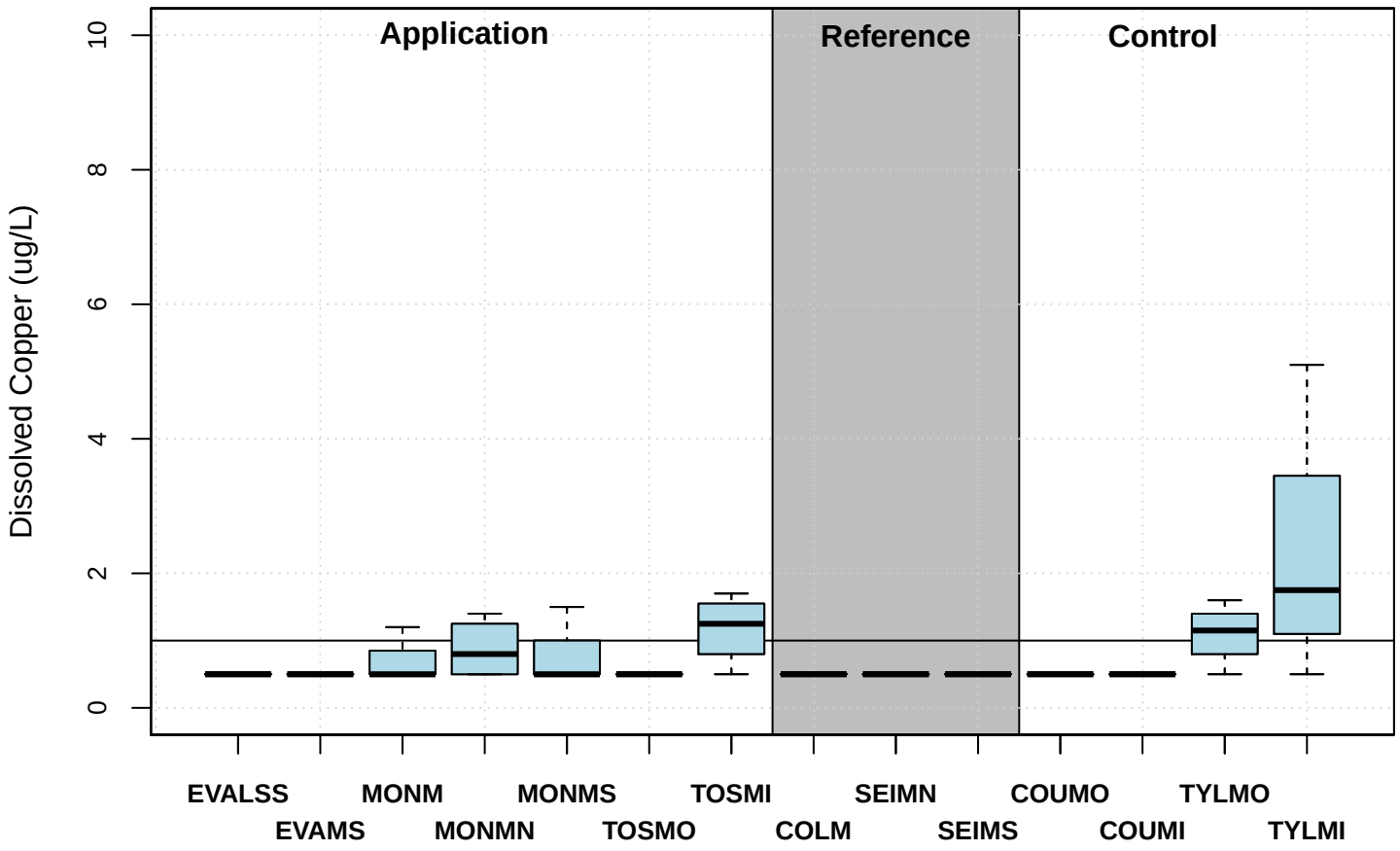
µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

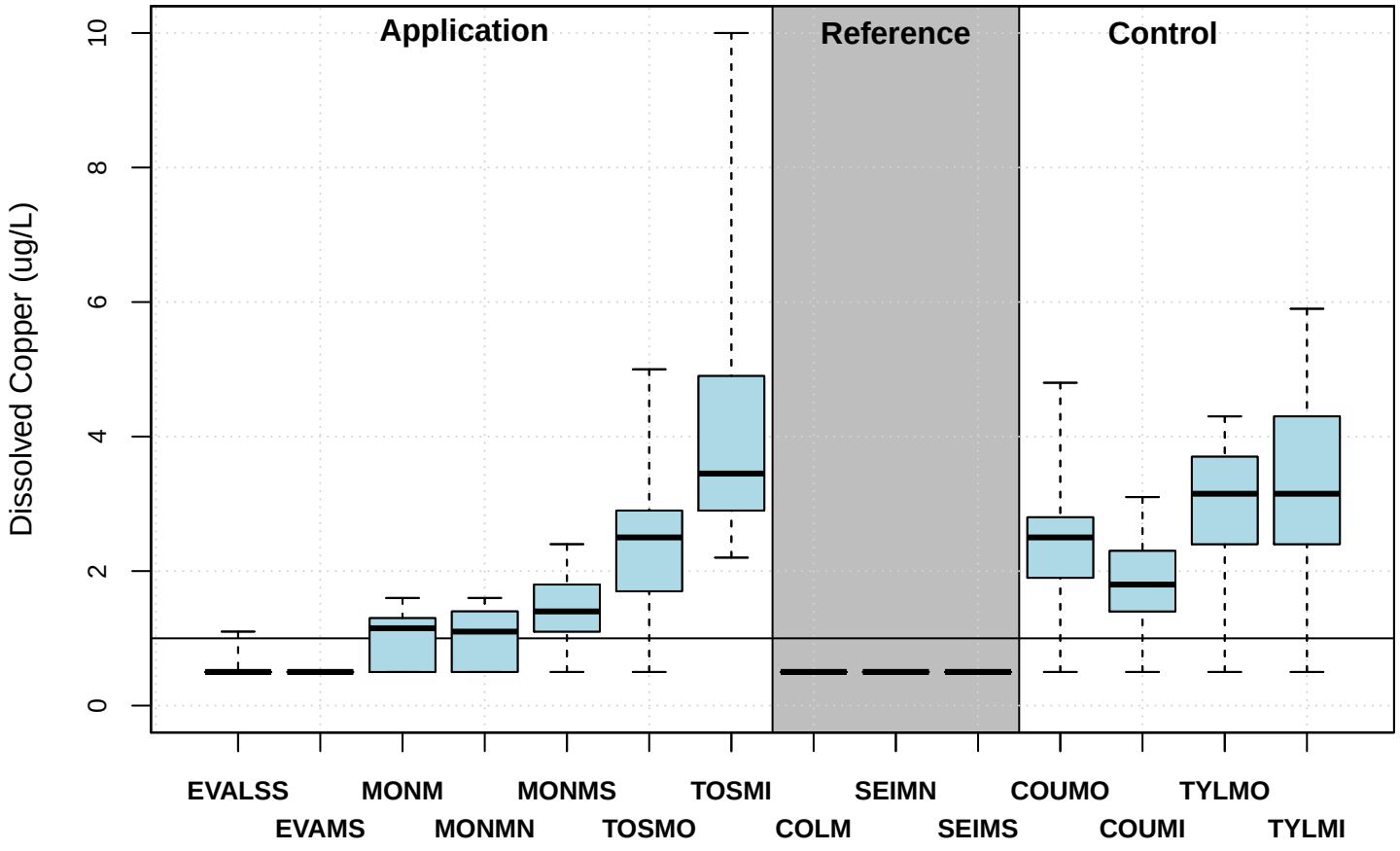
APPENDIX I

Box and Whisker Plots Showing Pollutant Concentrations Measured in Storm Event and Base Flow Samples

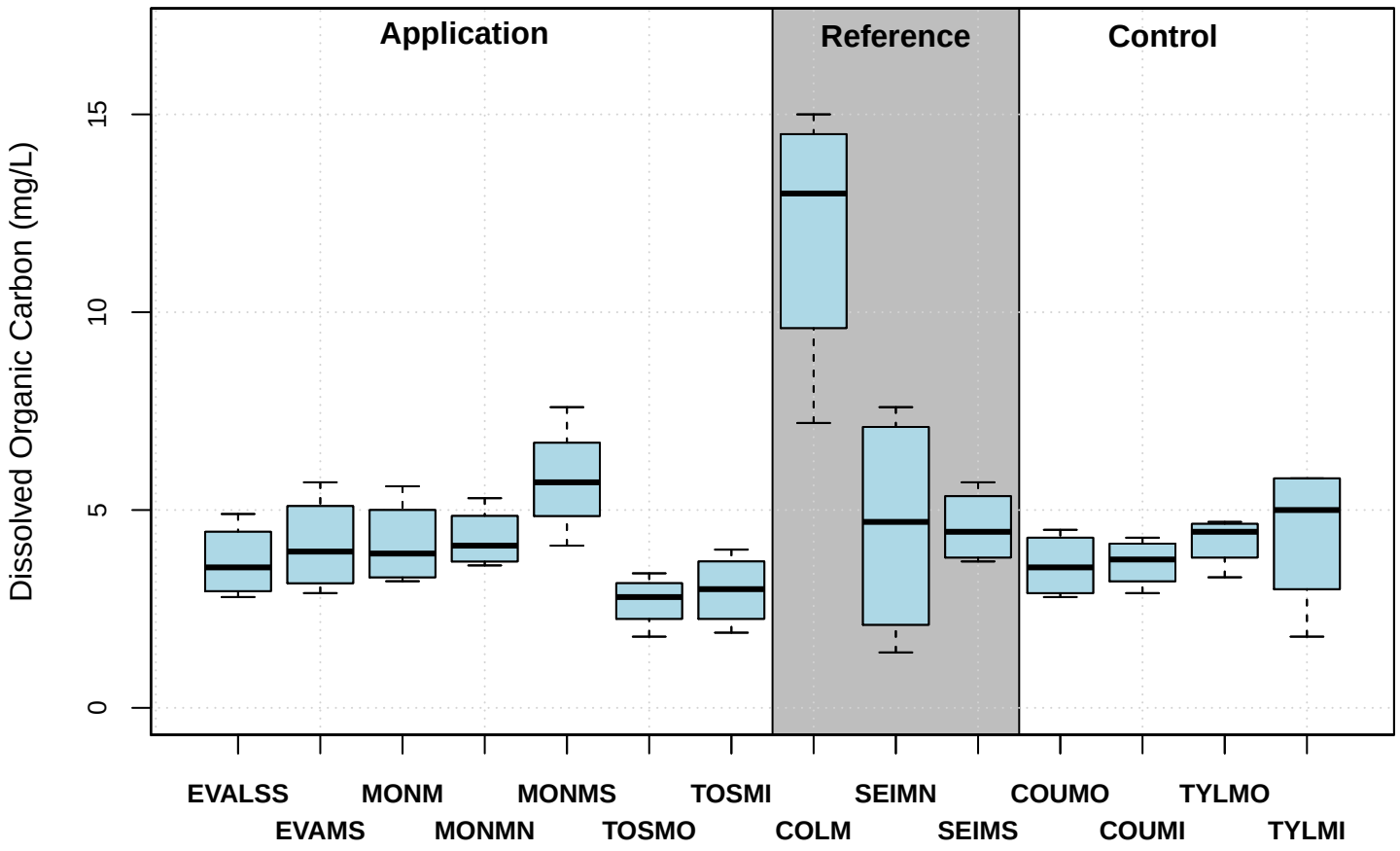
Base Flow



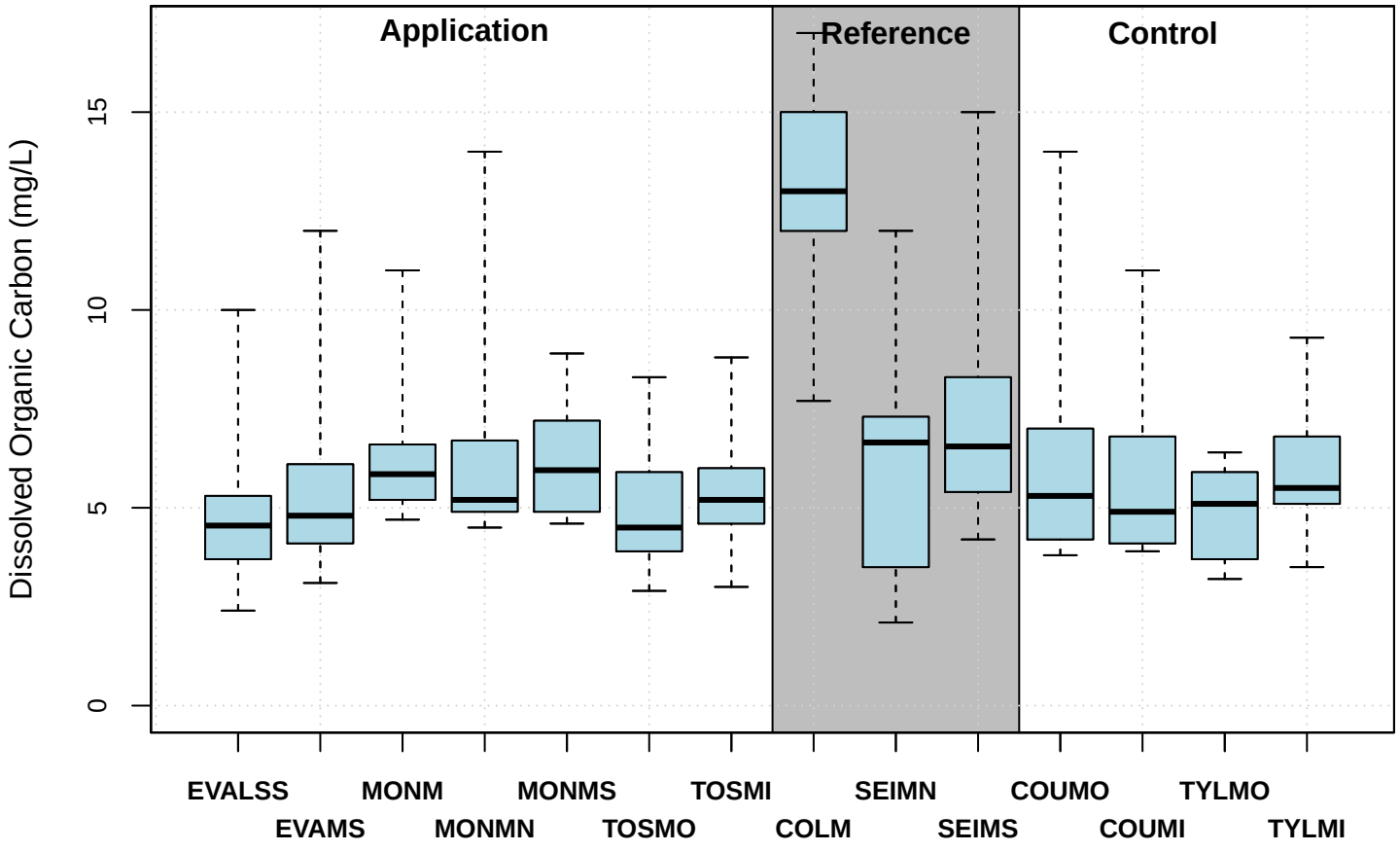
Storm Events



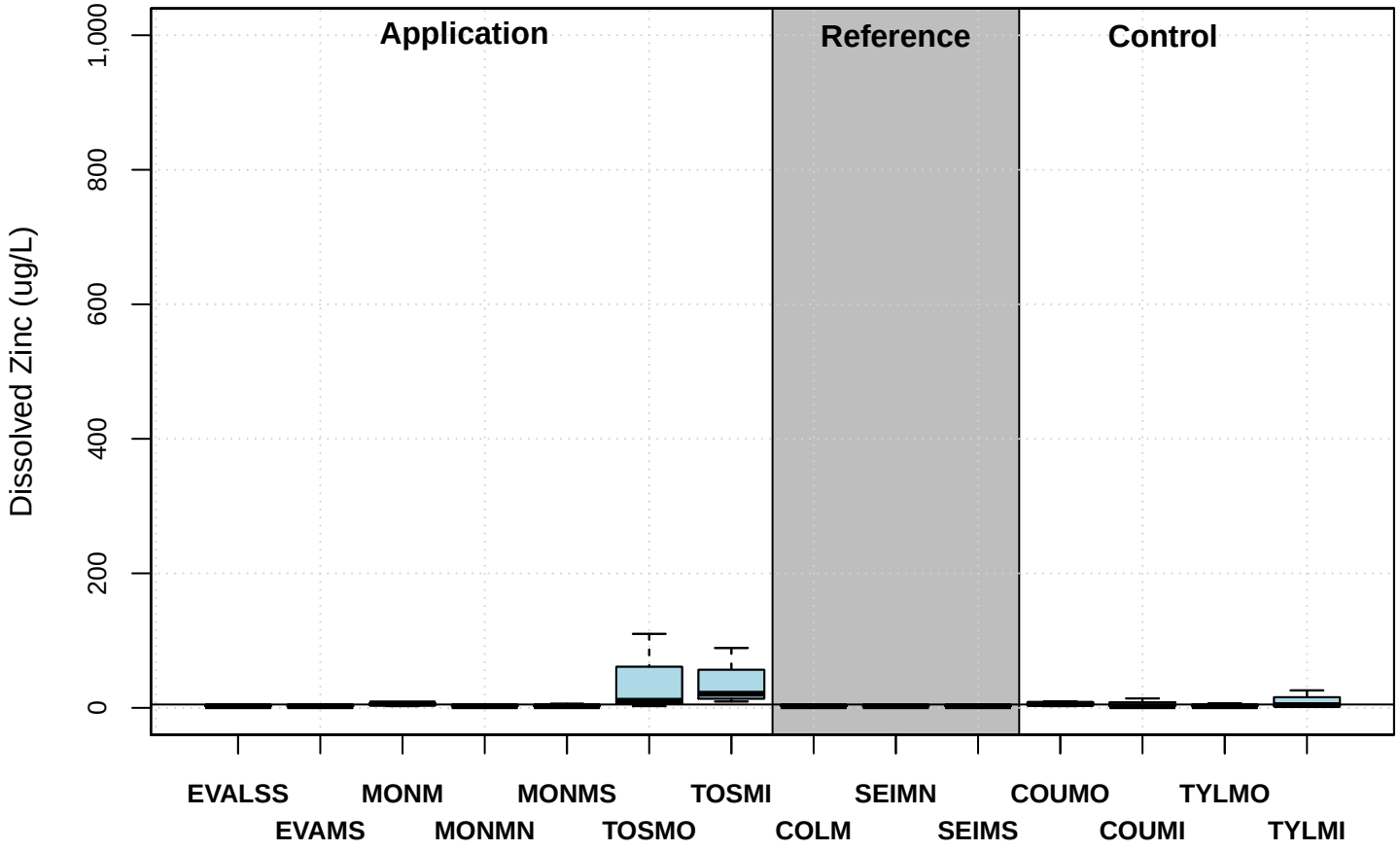
Base Flow



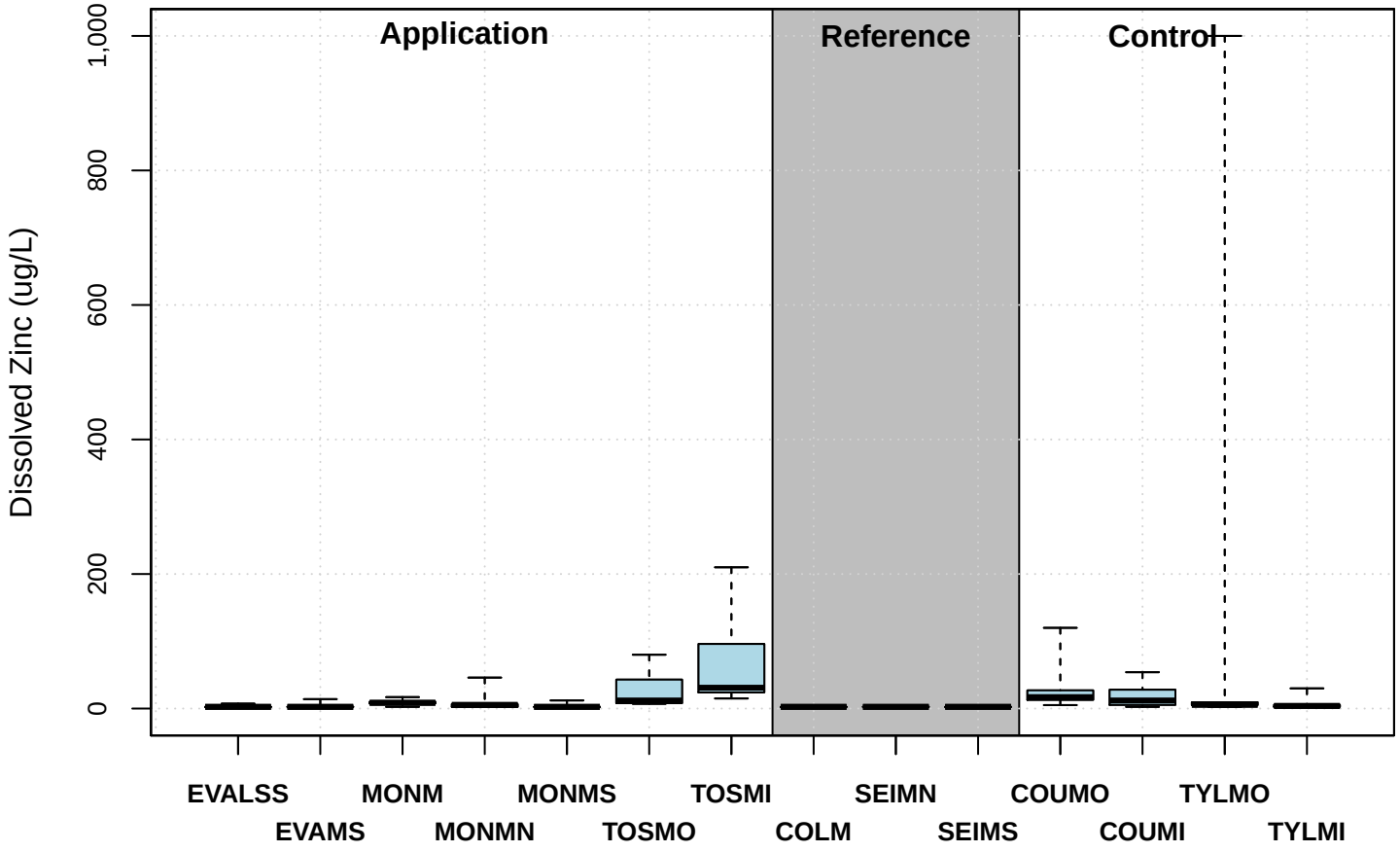
Storm Events



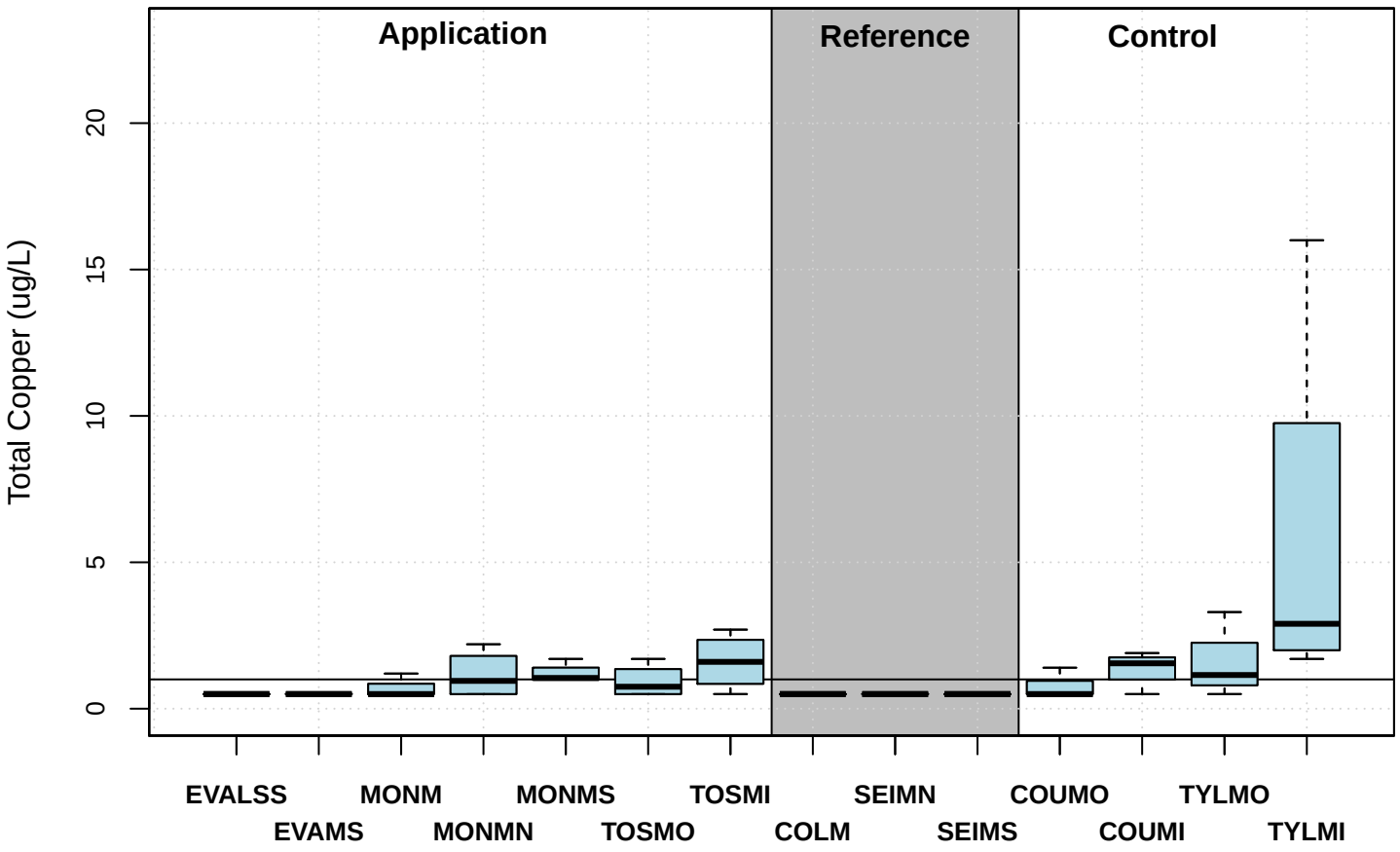
Base Flow



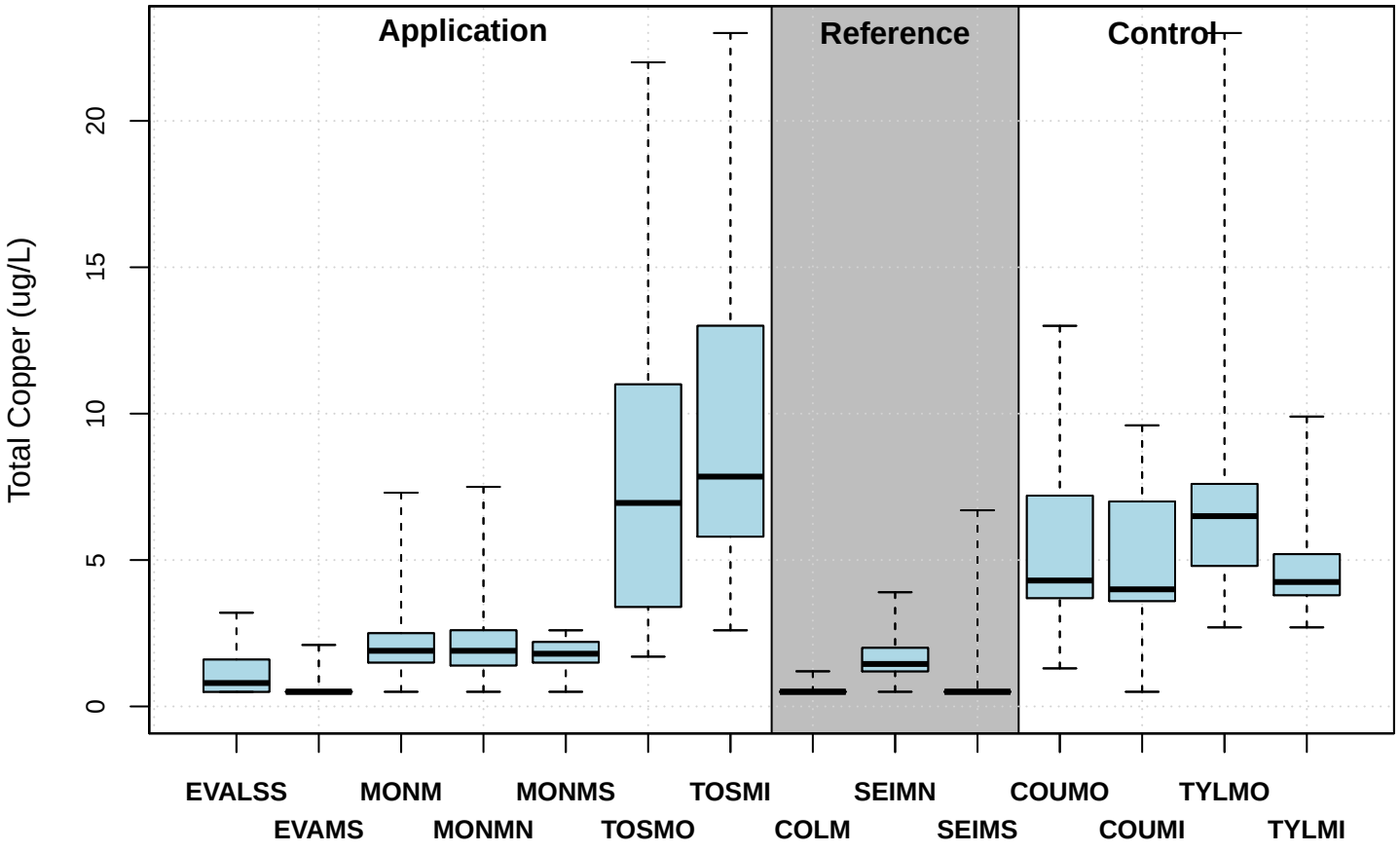
Storm Events



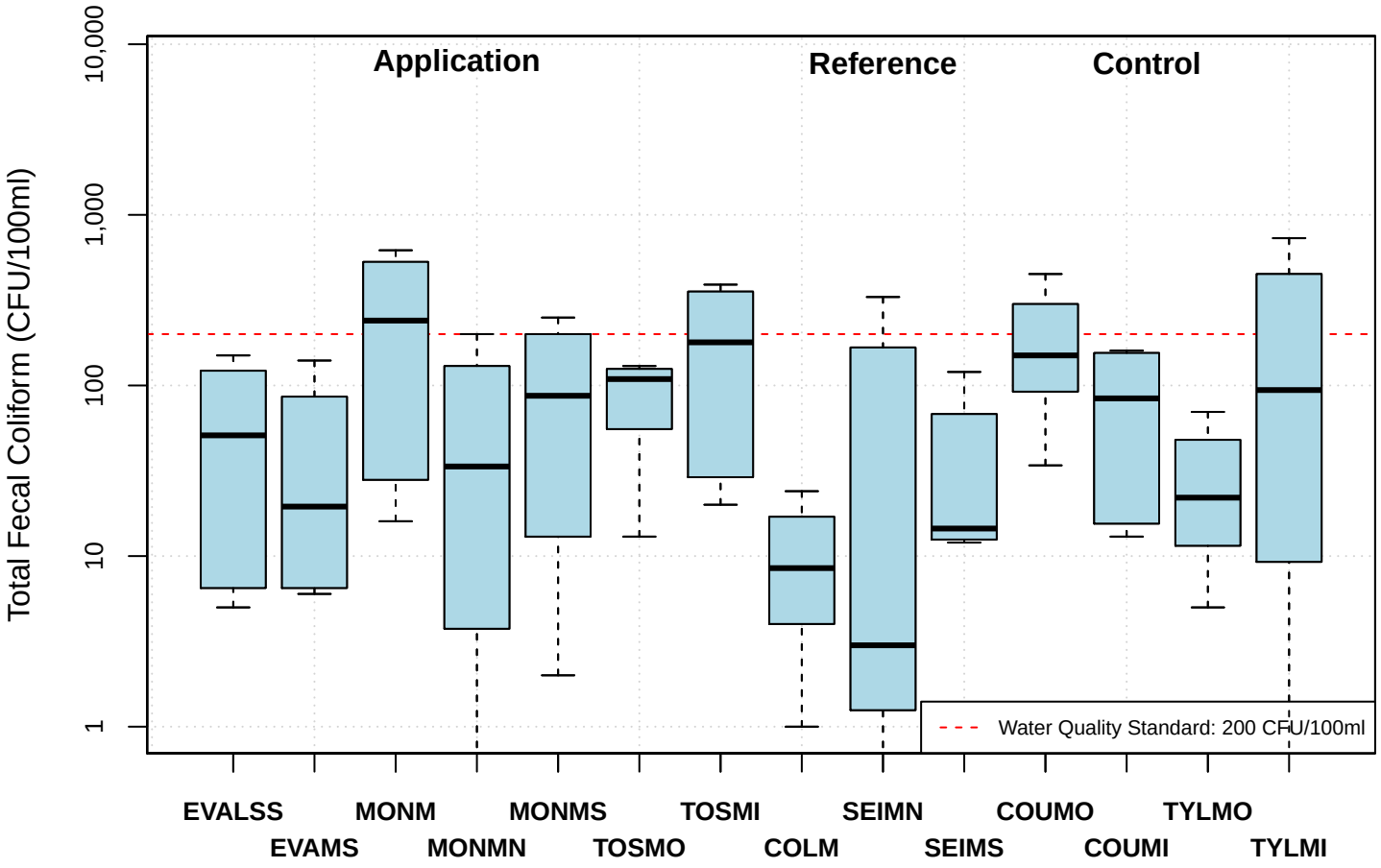
Base Flow



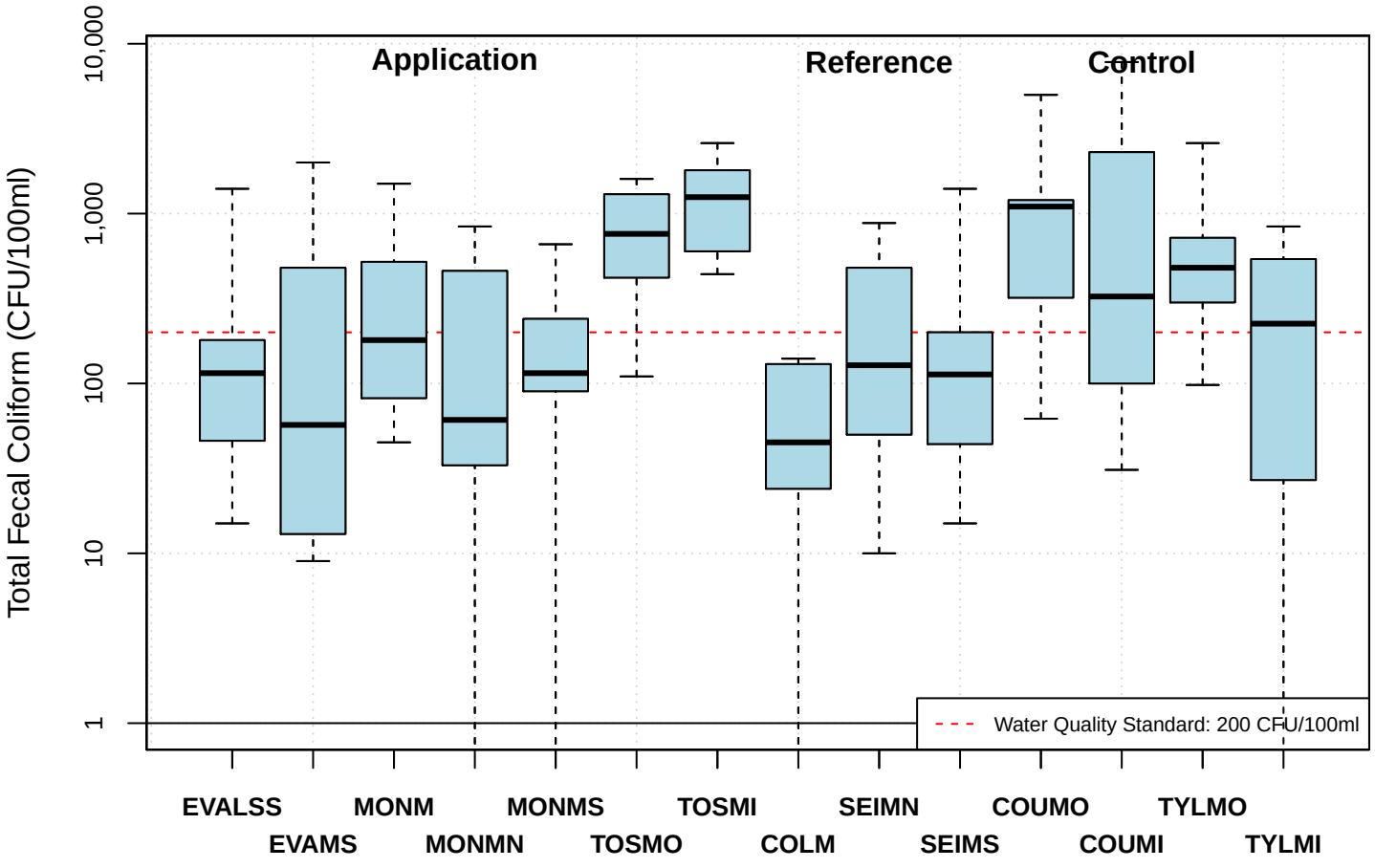
Storm Events



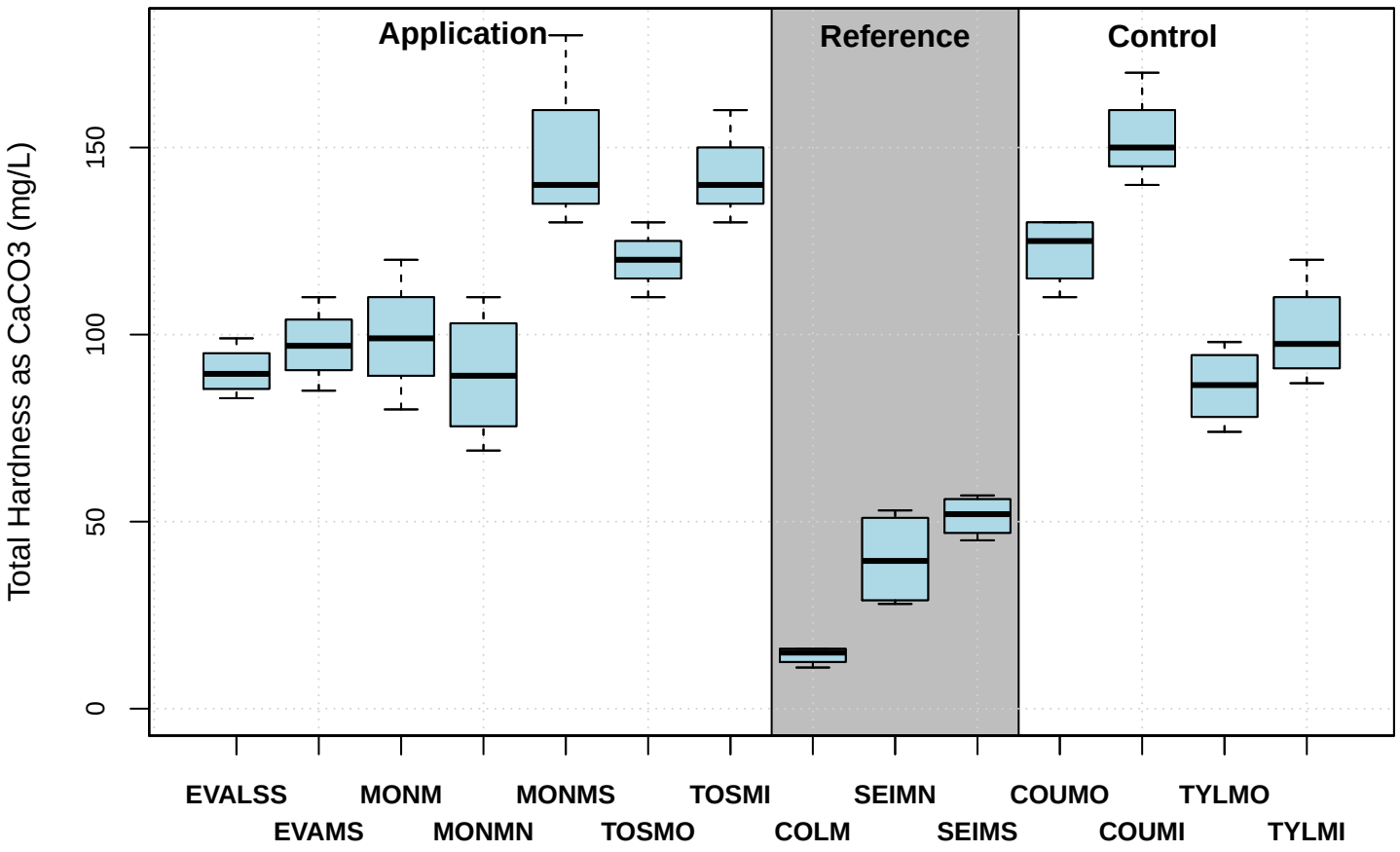
Base Flow



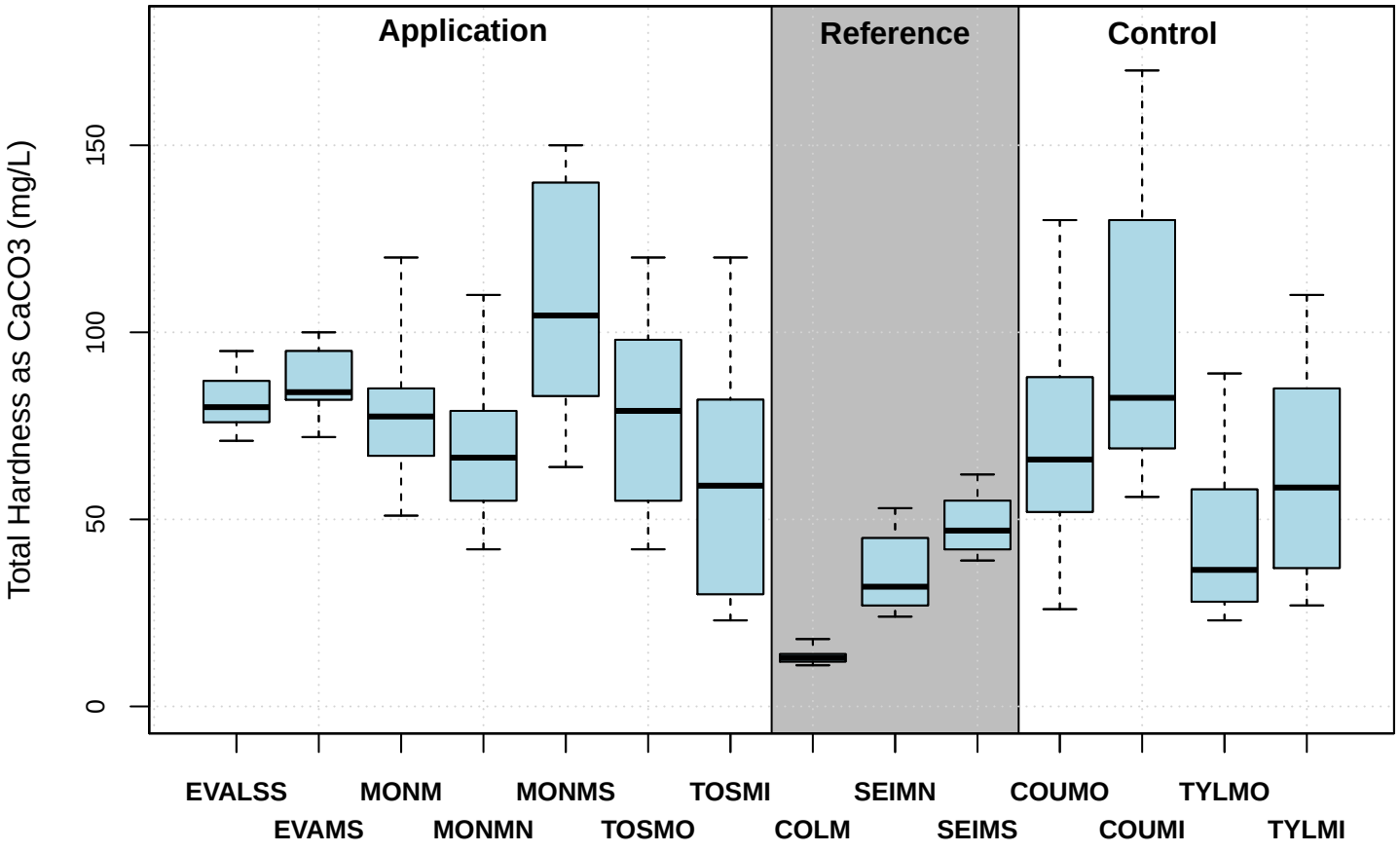
Storm Events



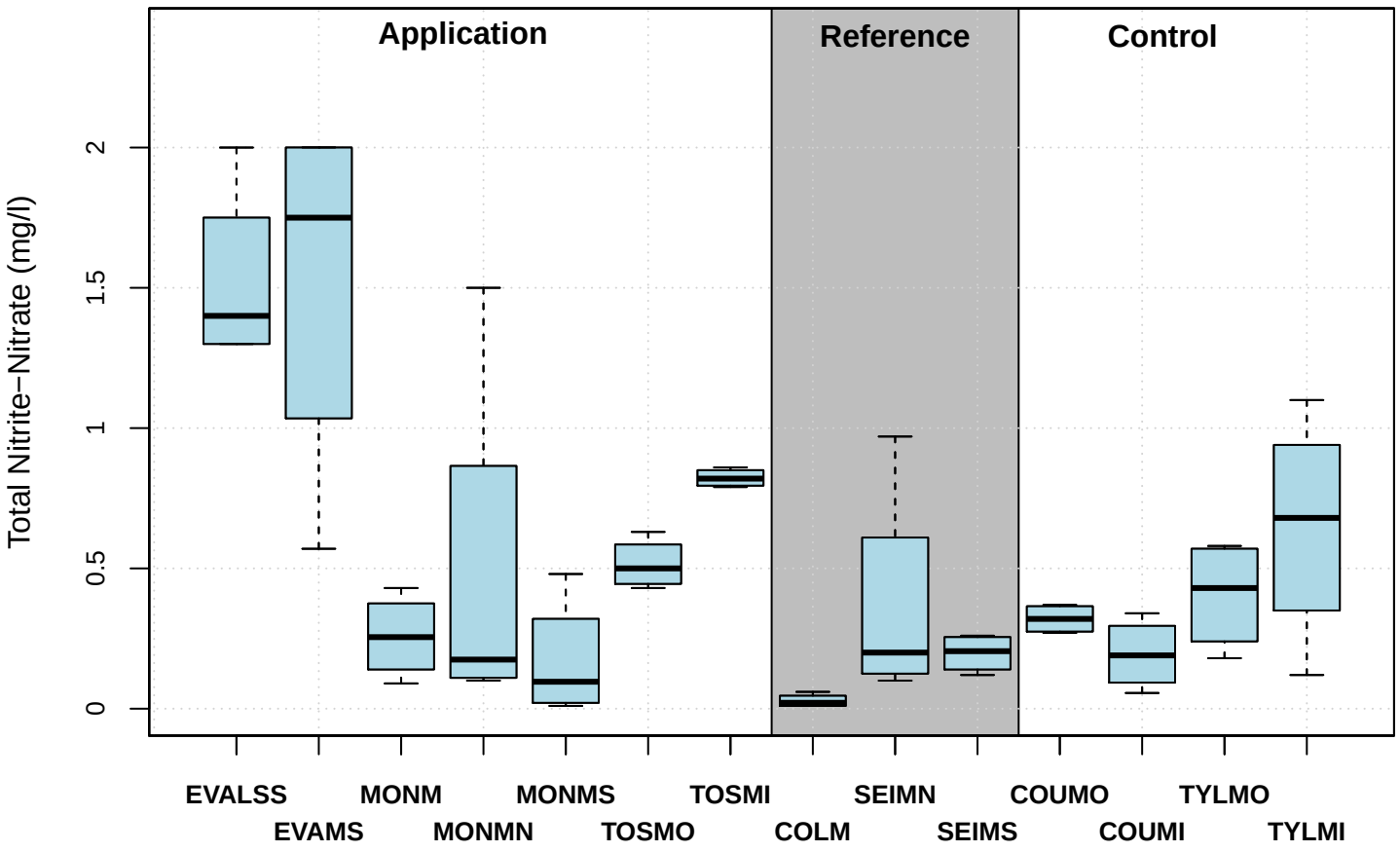
Base Flow



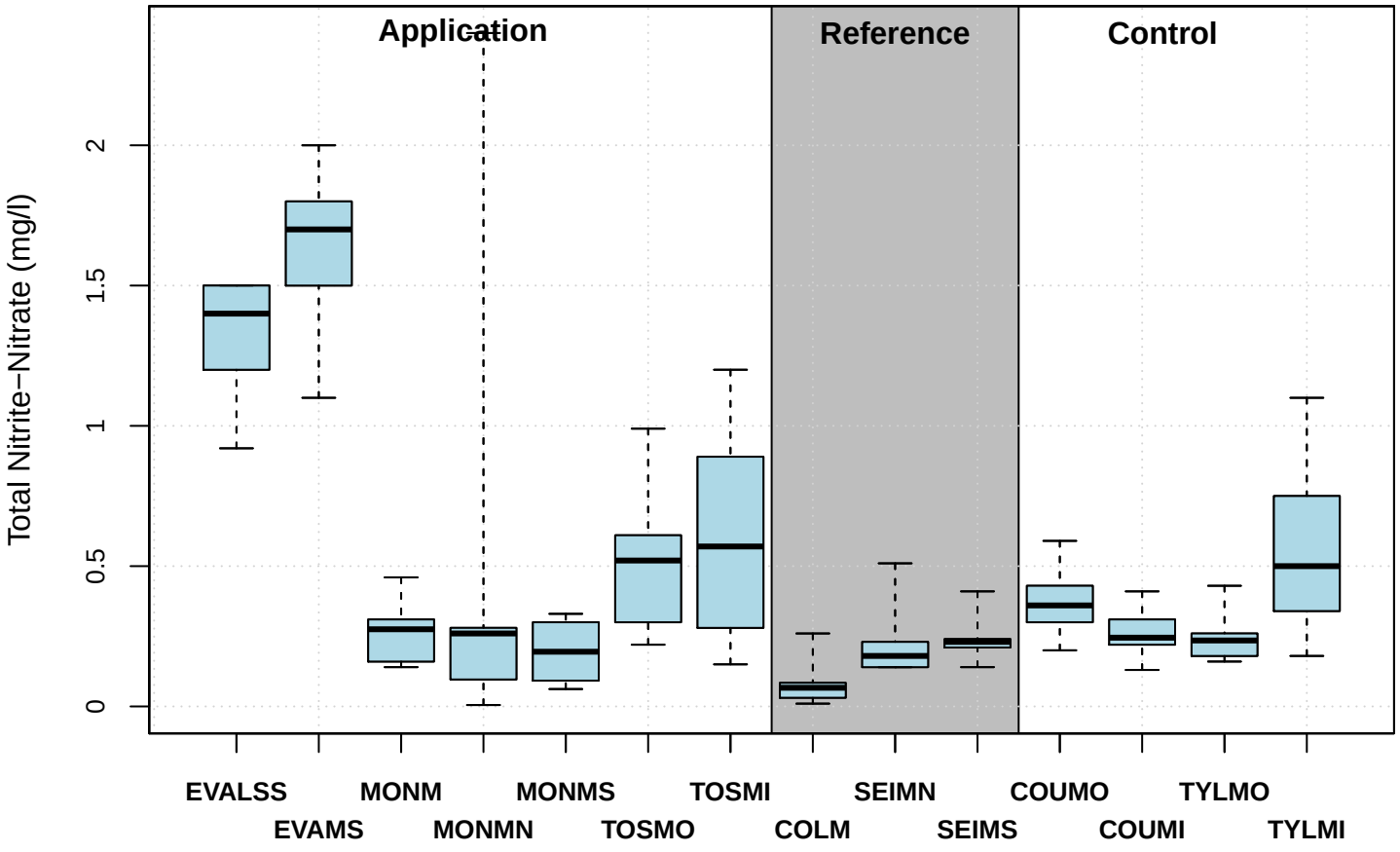
Storm Events



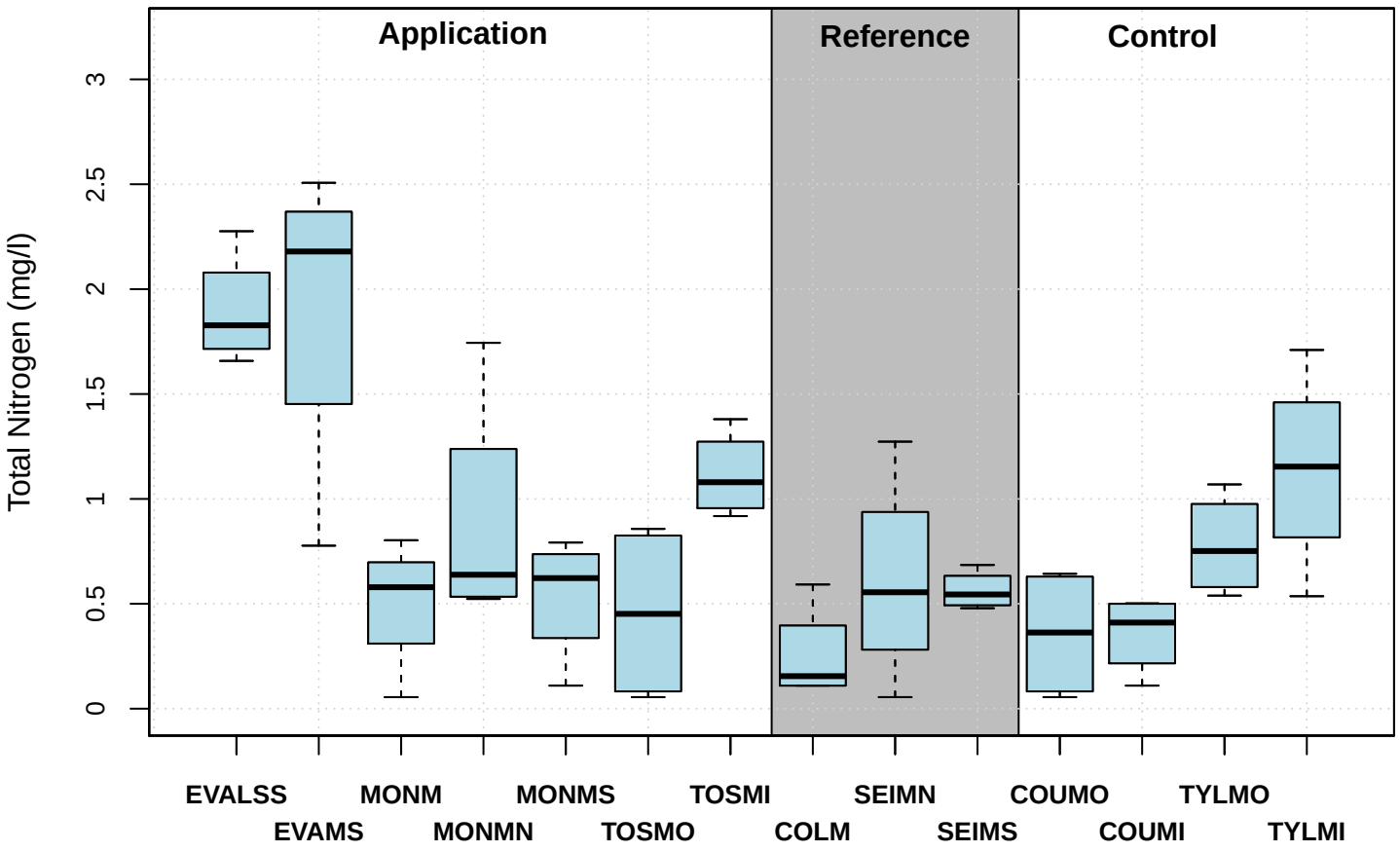
Base Flow



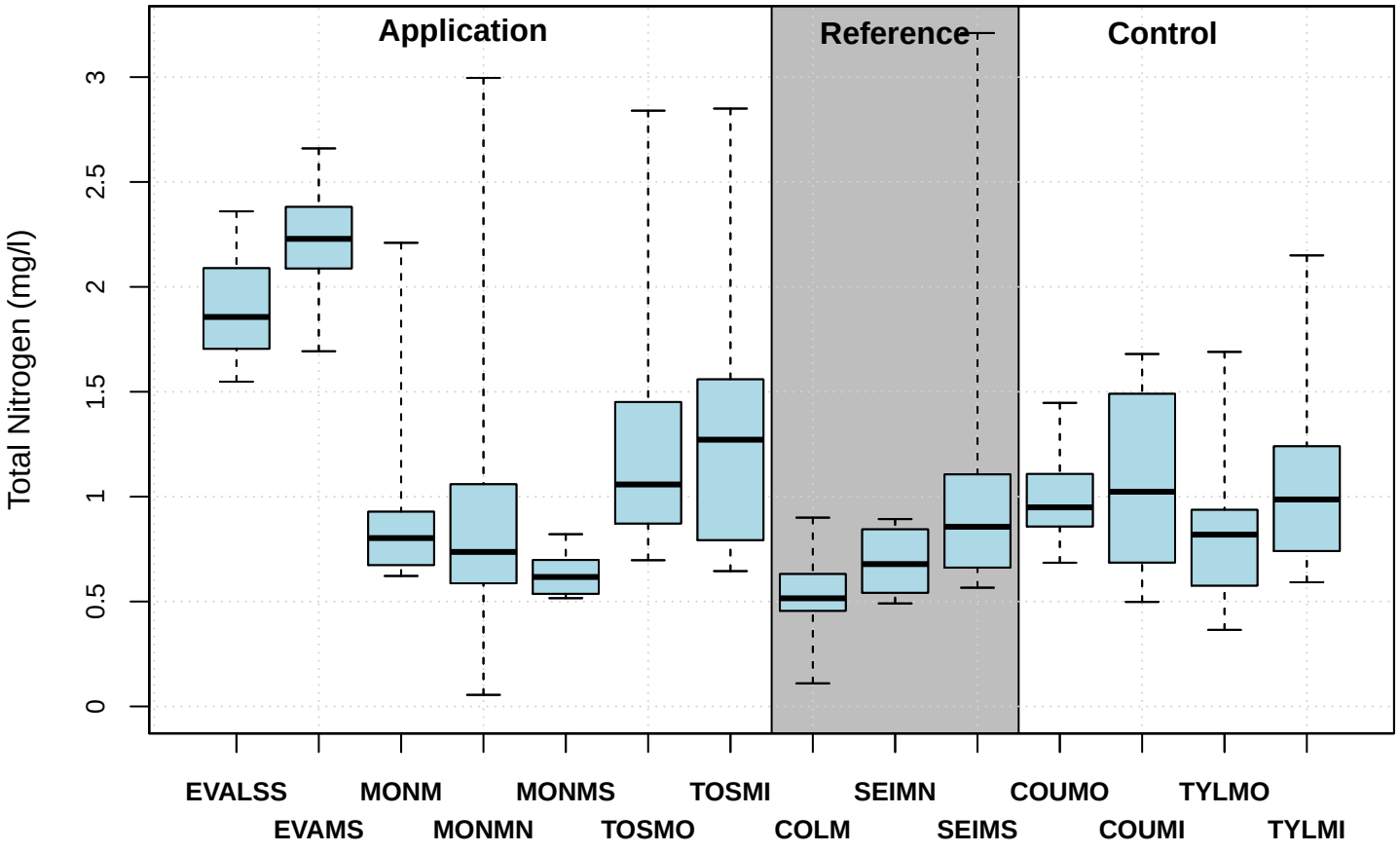
Storm Events



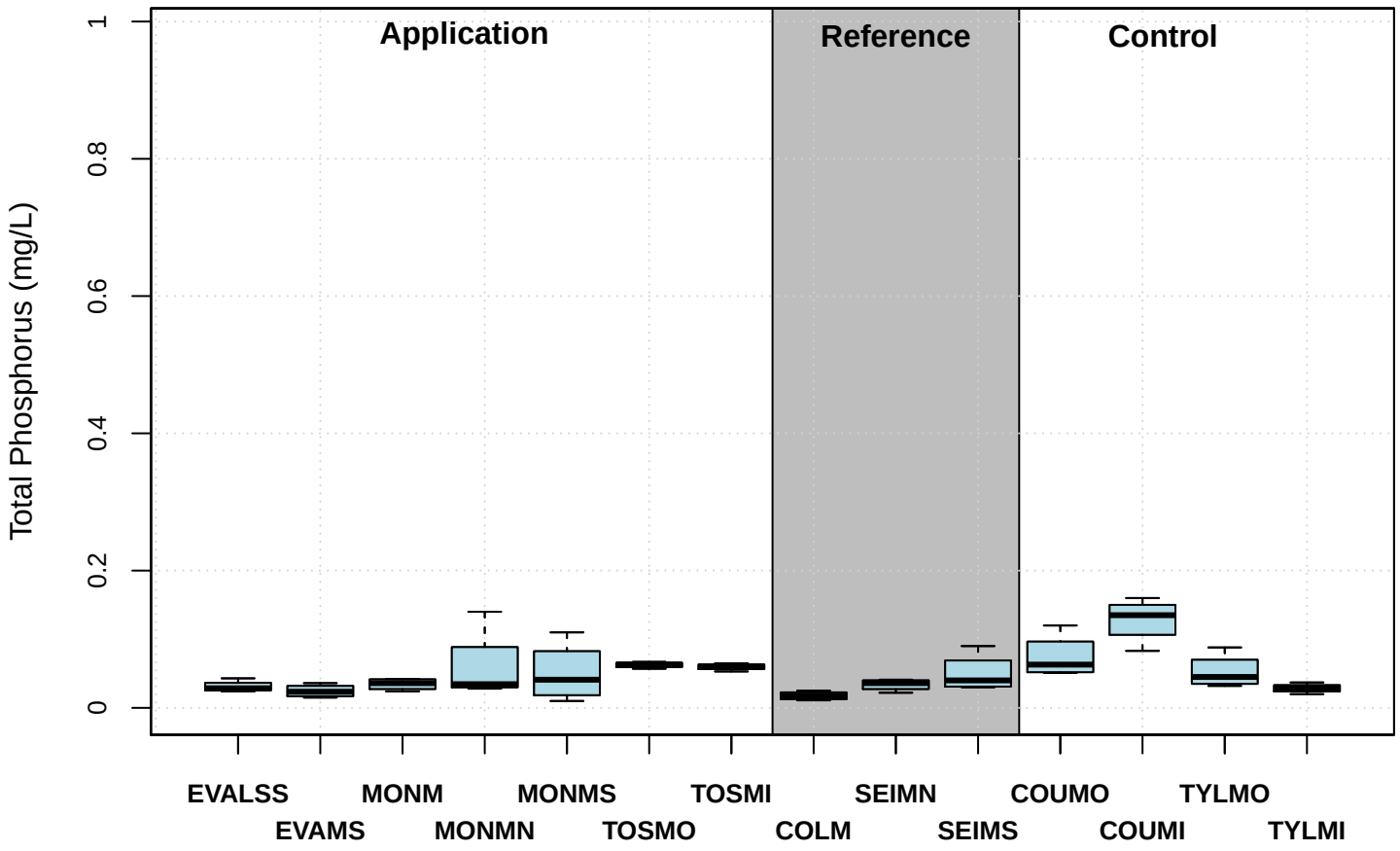
Base Flow



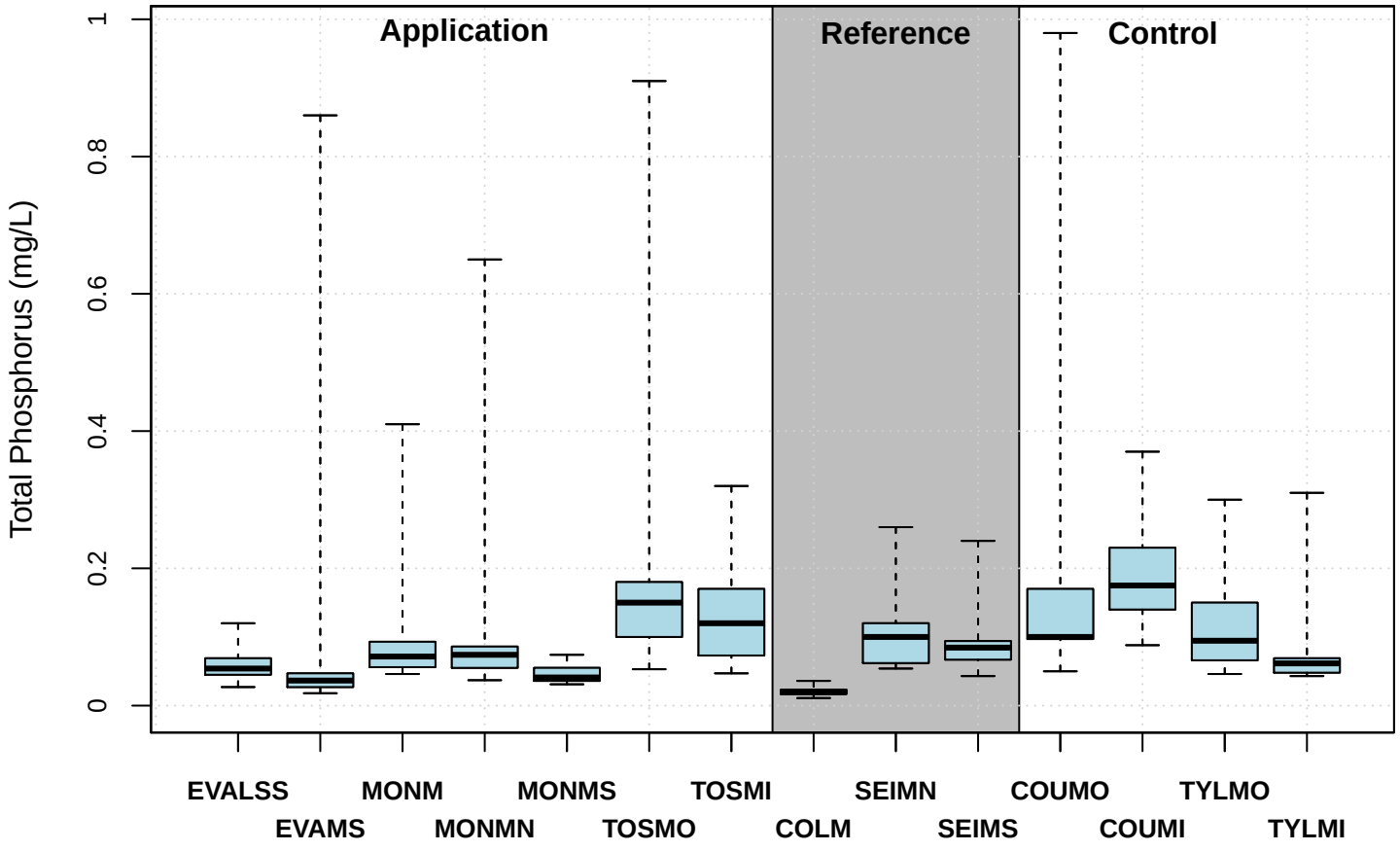
Storm Events



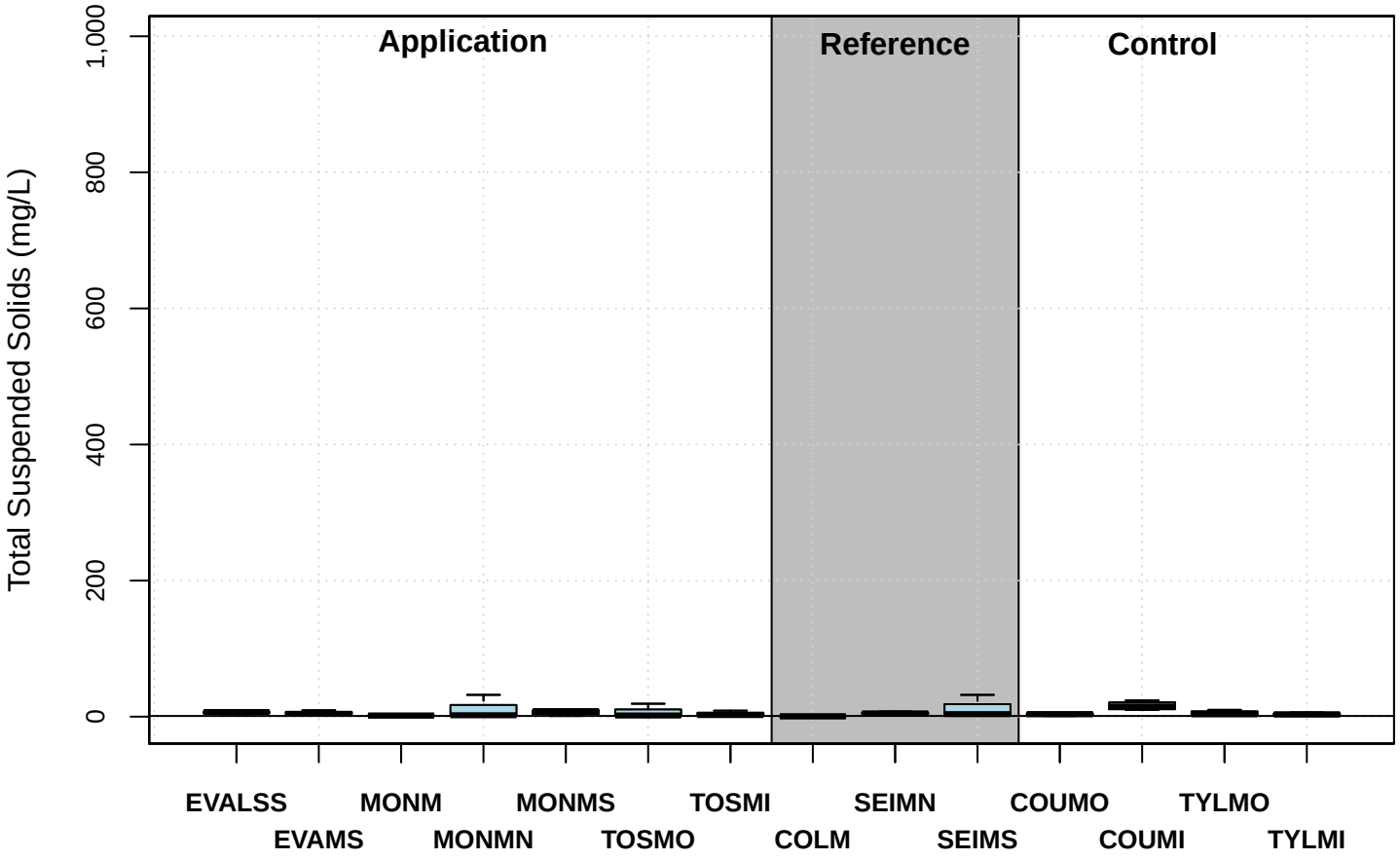
Base Flow



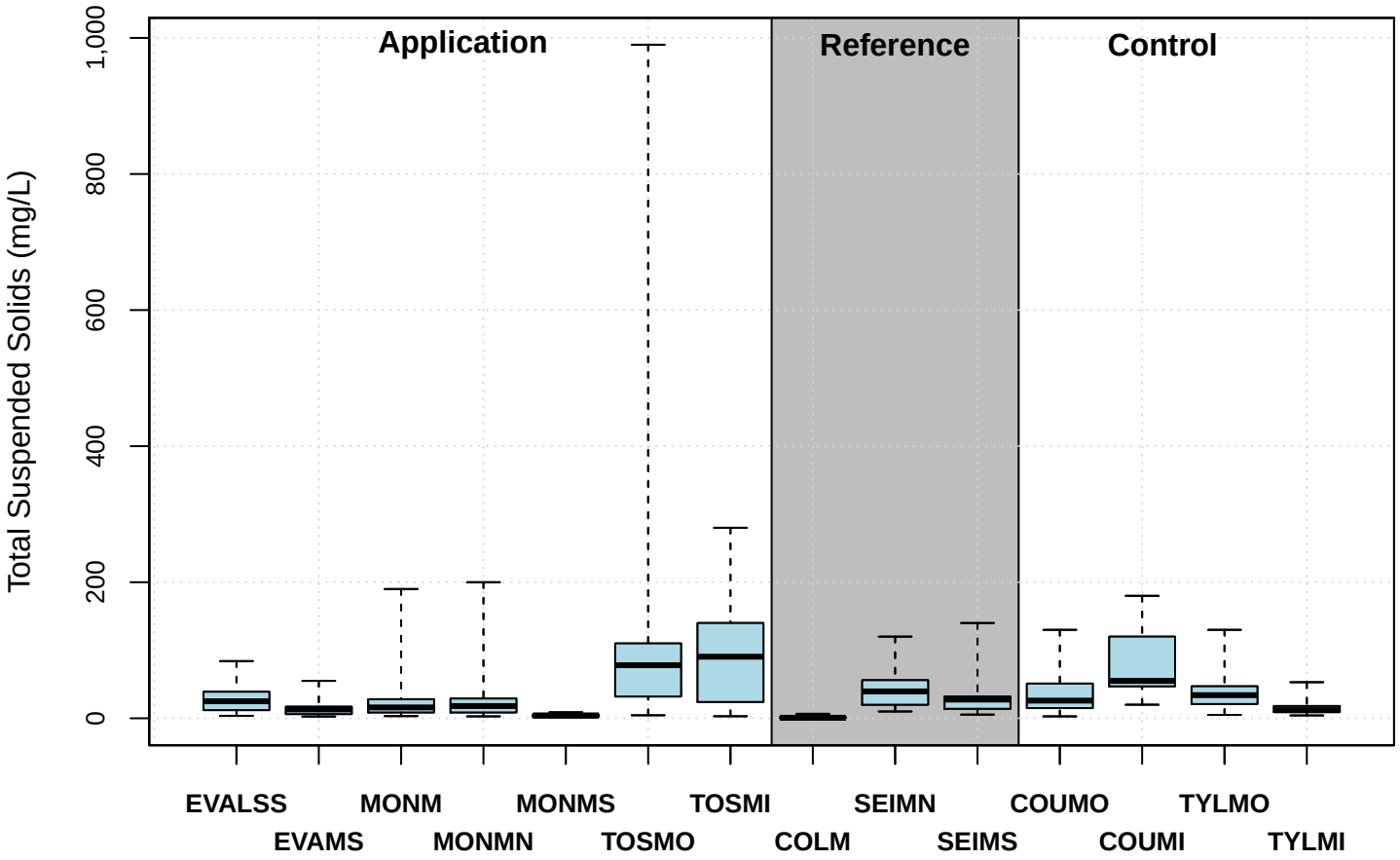
Storm Events



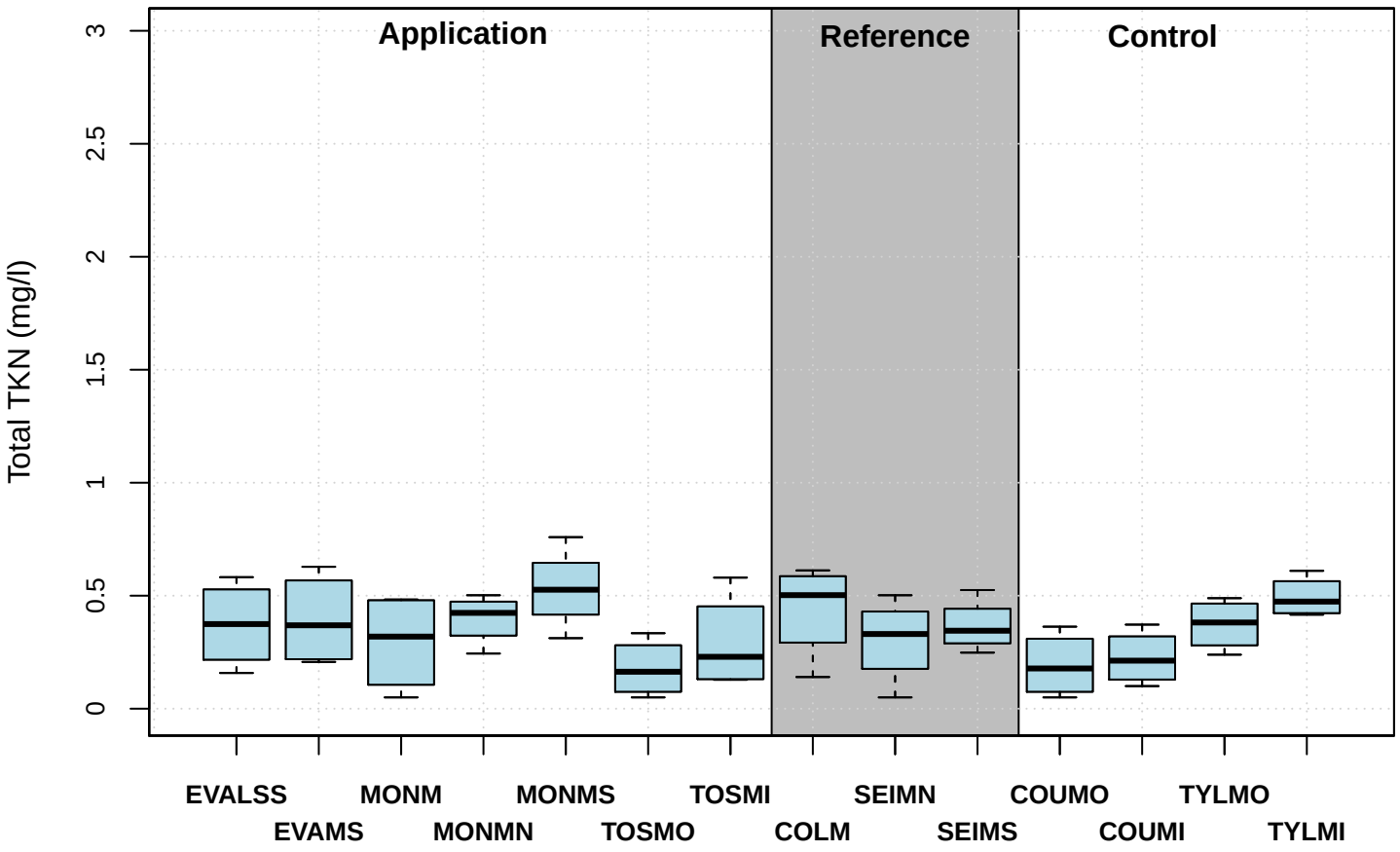
Base Flow



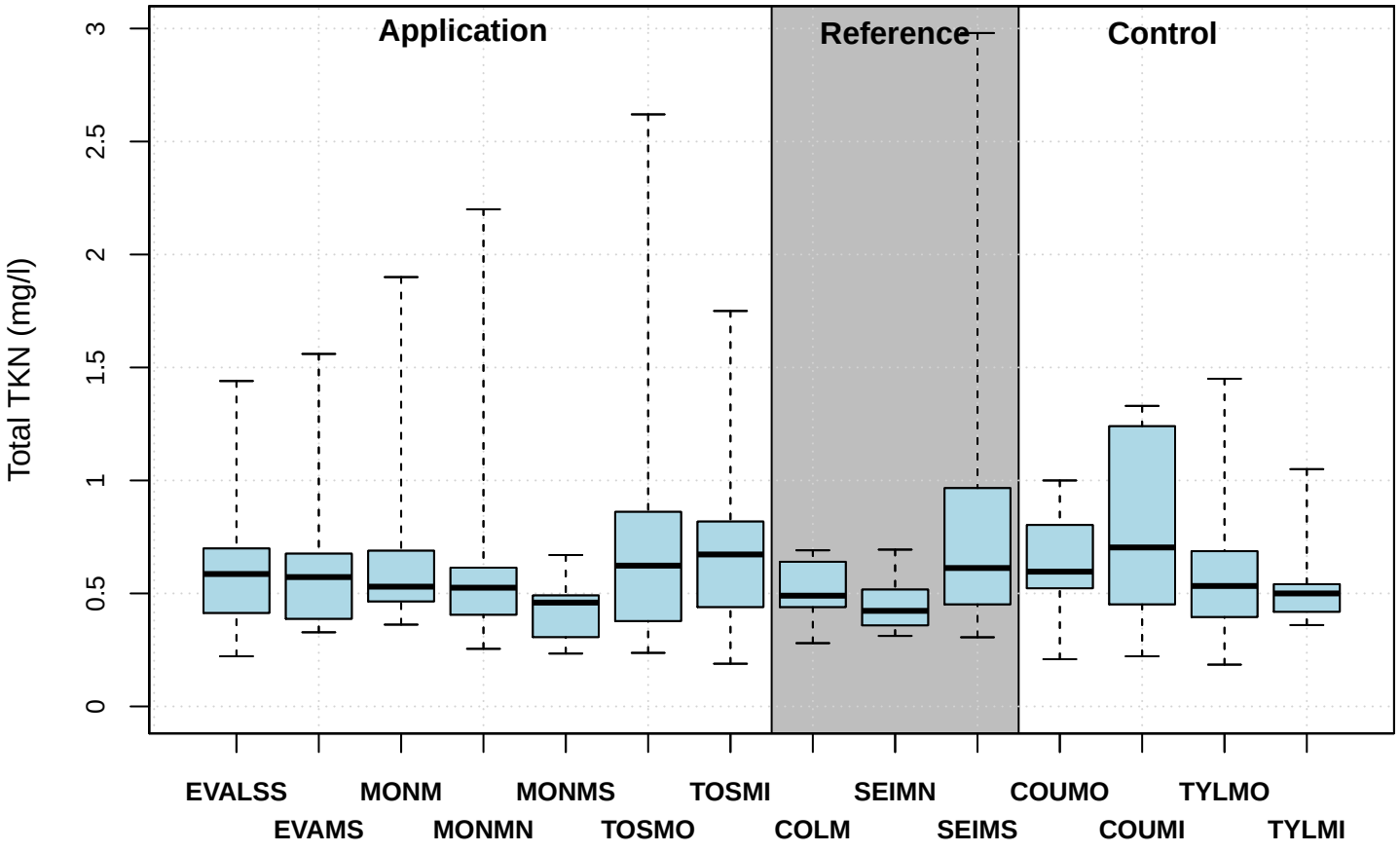
Storm Events



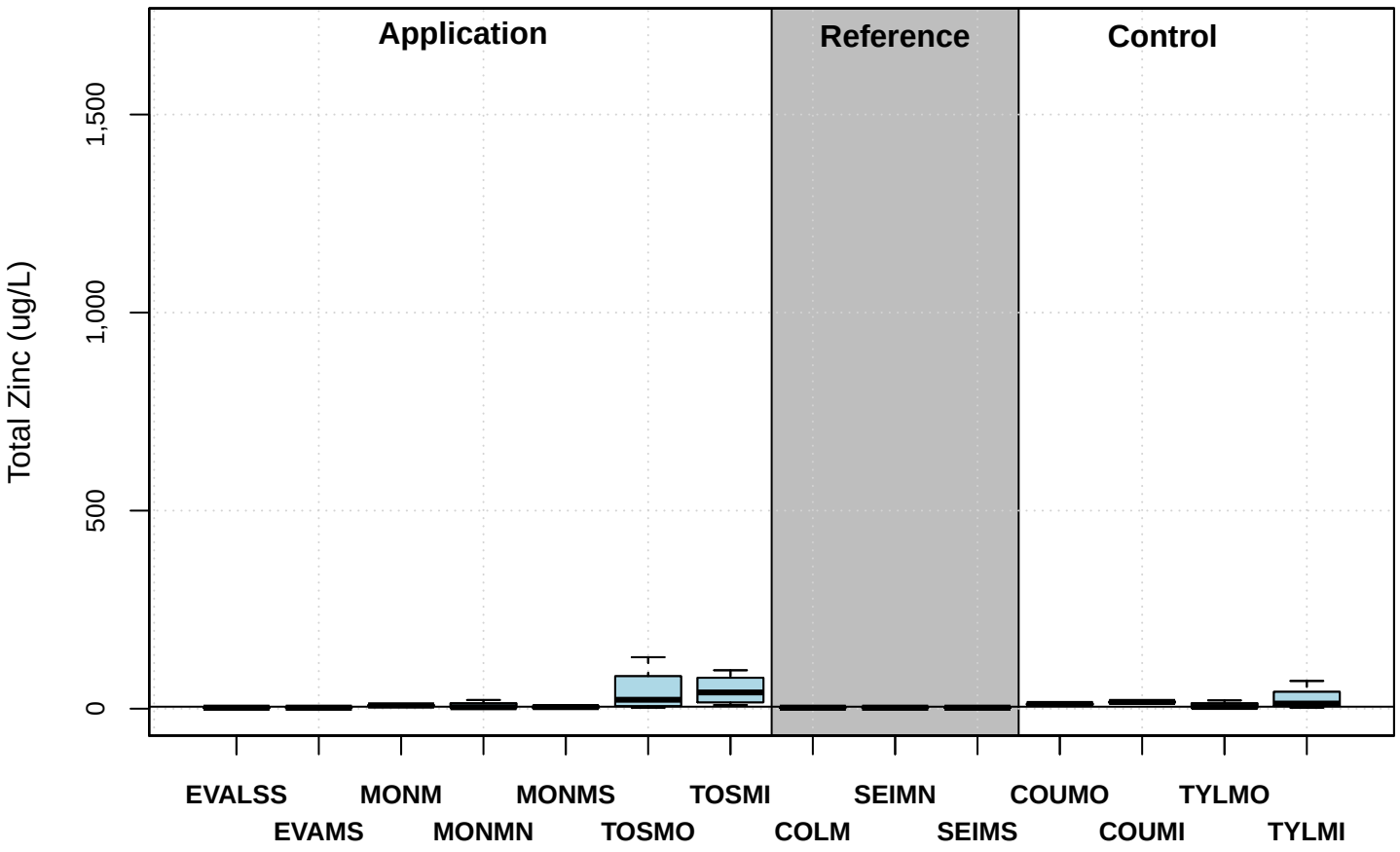
Base Flow



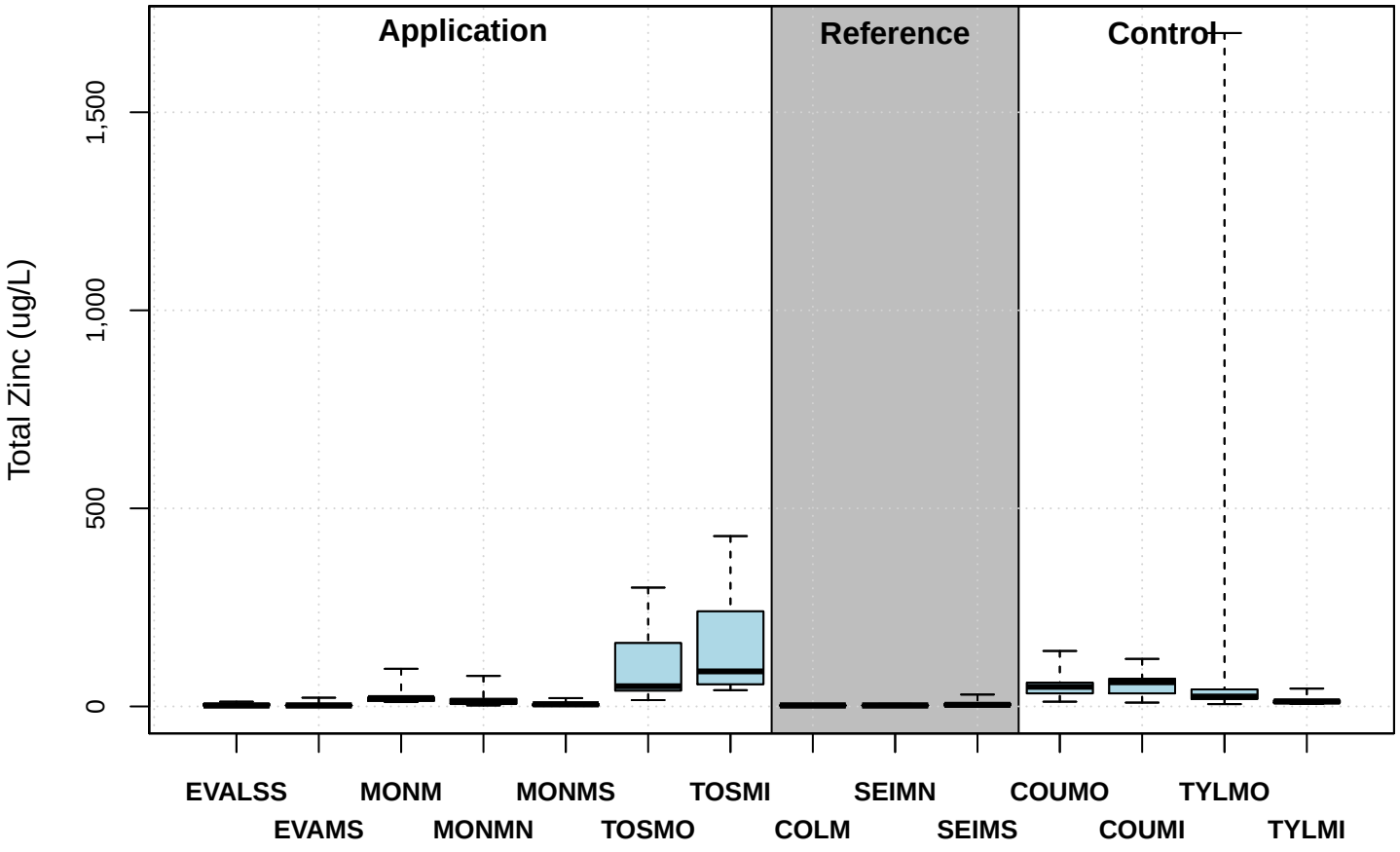
Storm Events



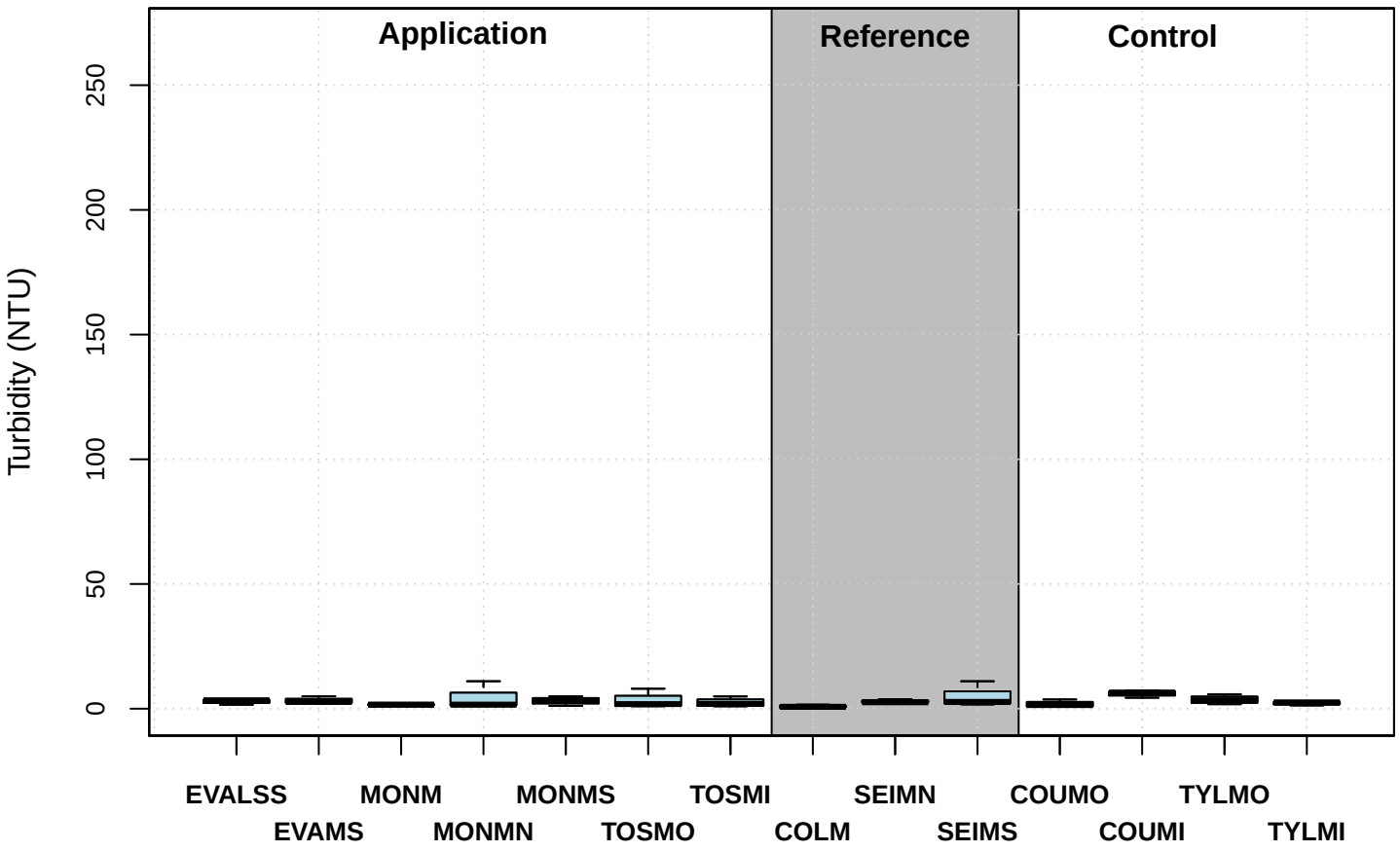
Base Flow



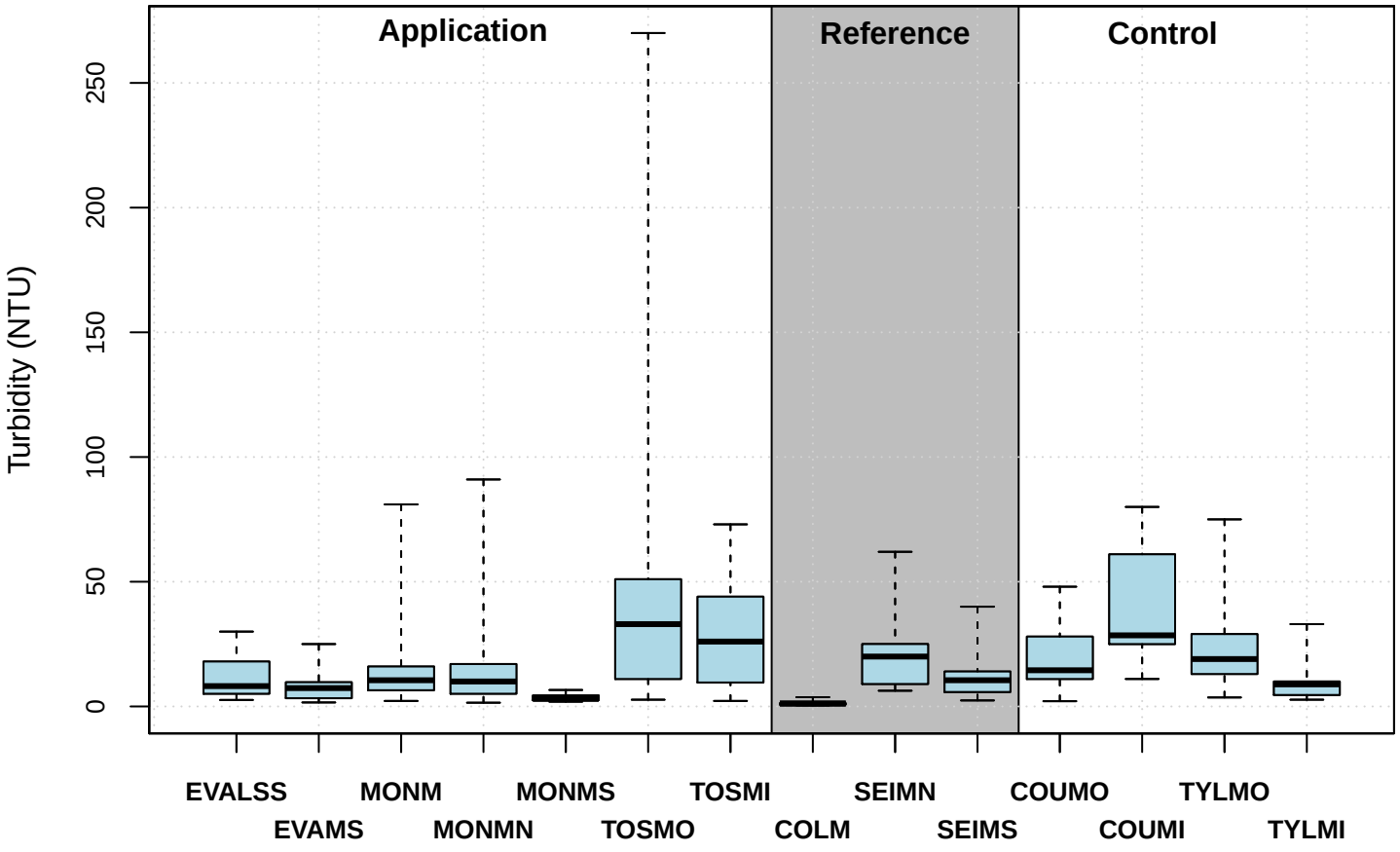
Storm Events



Base Flow



Storm Events



APPENDIX J

Line Plots Showing Continuous Temperature Data

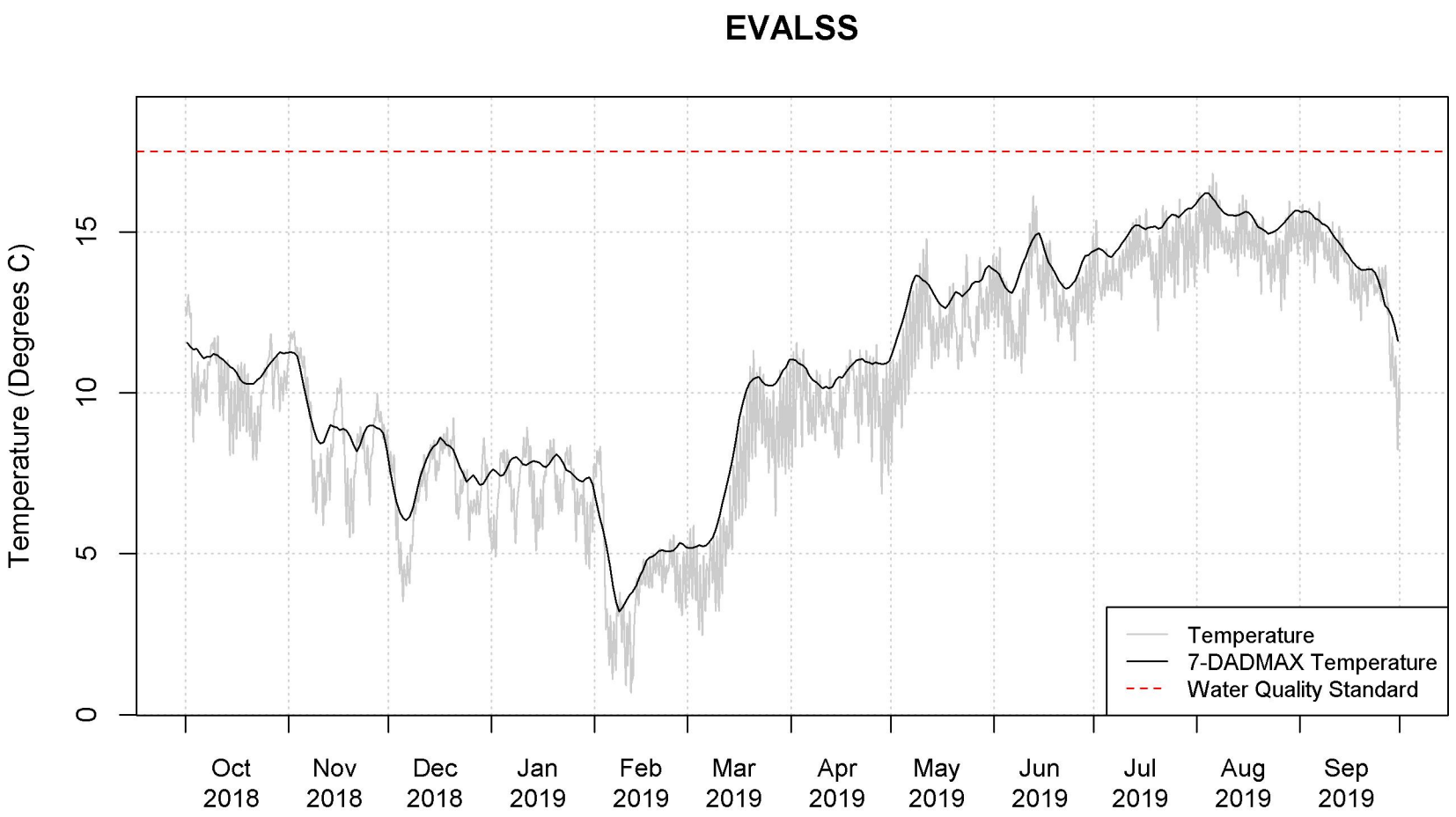


Figure J-1. Continuous Temperature and 7-DADMAX Measured at the EVALSS Station.

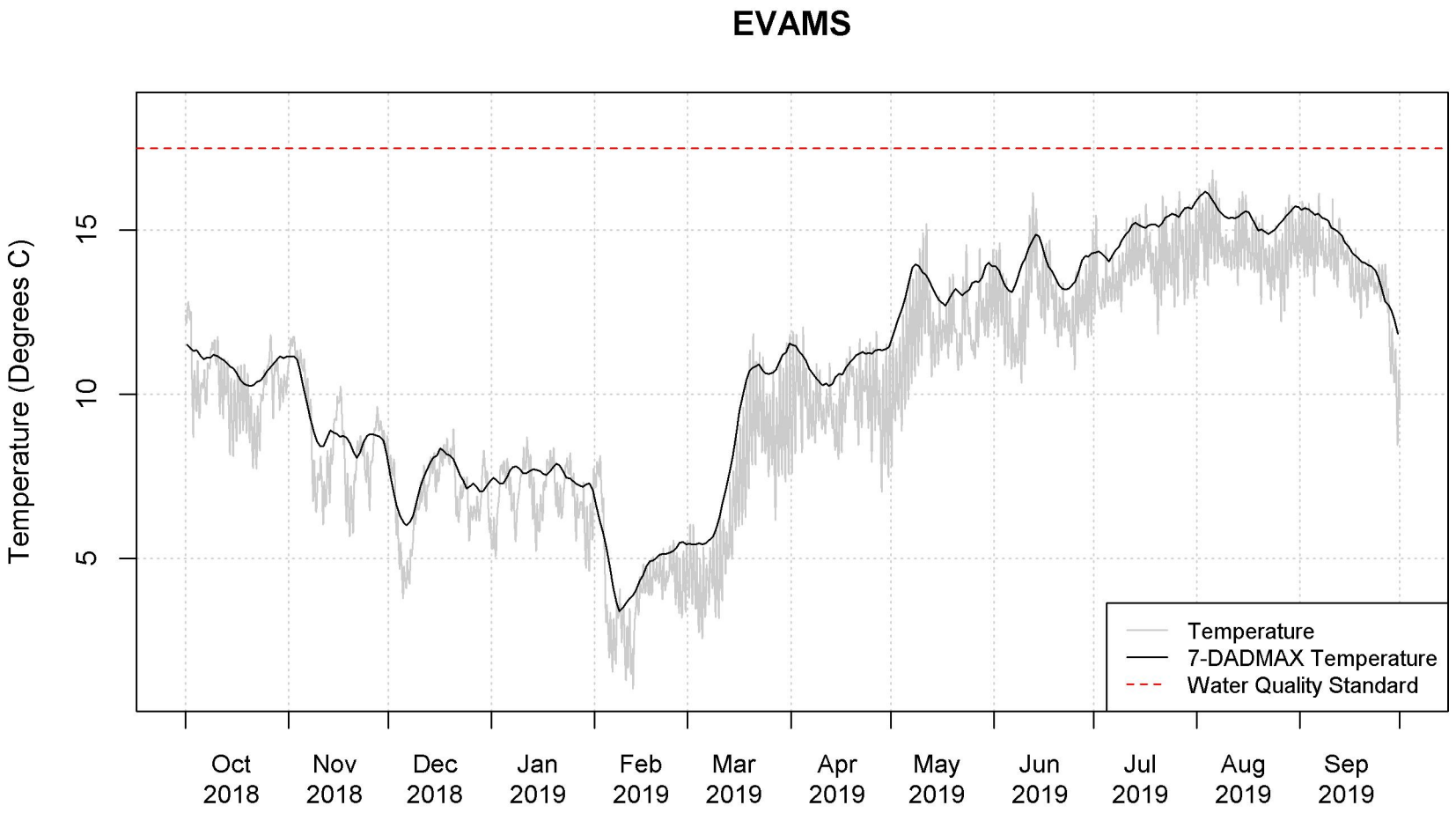


Figure J-2. Continuous Temperature and 7-DADMAX Measured at the EVAMS Station.

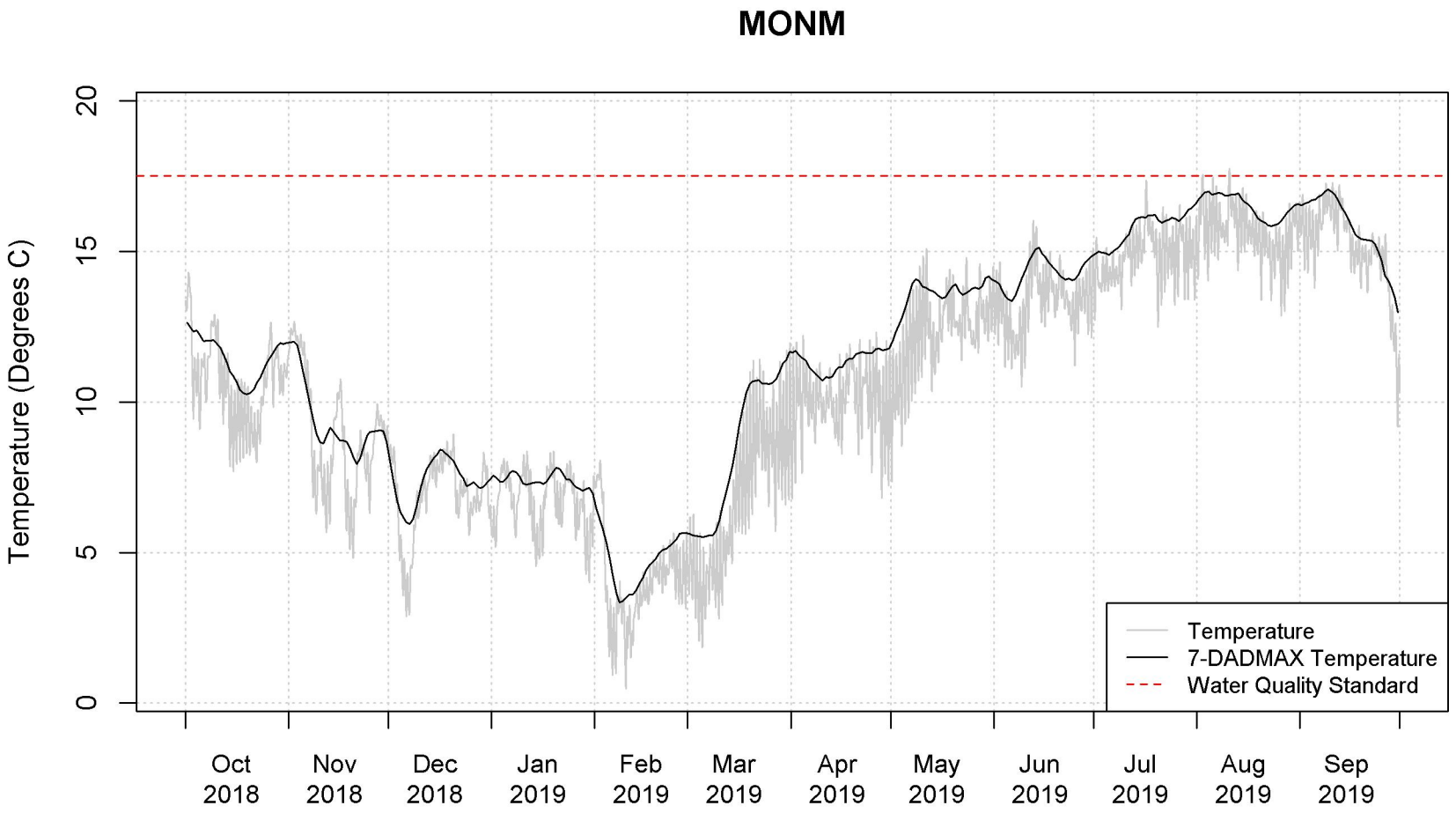


Figure J-3. Continuous Temperature and 7-DADMAX Measured at the MONM Station.

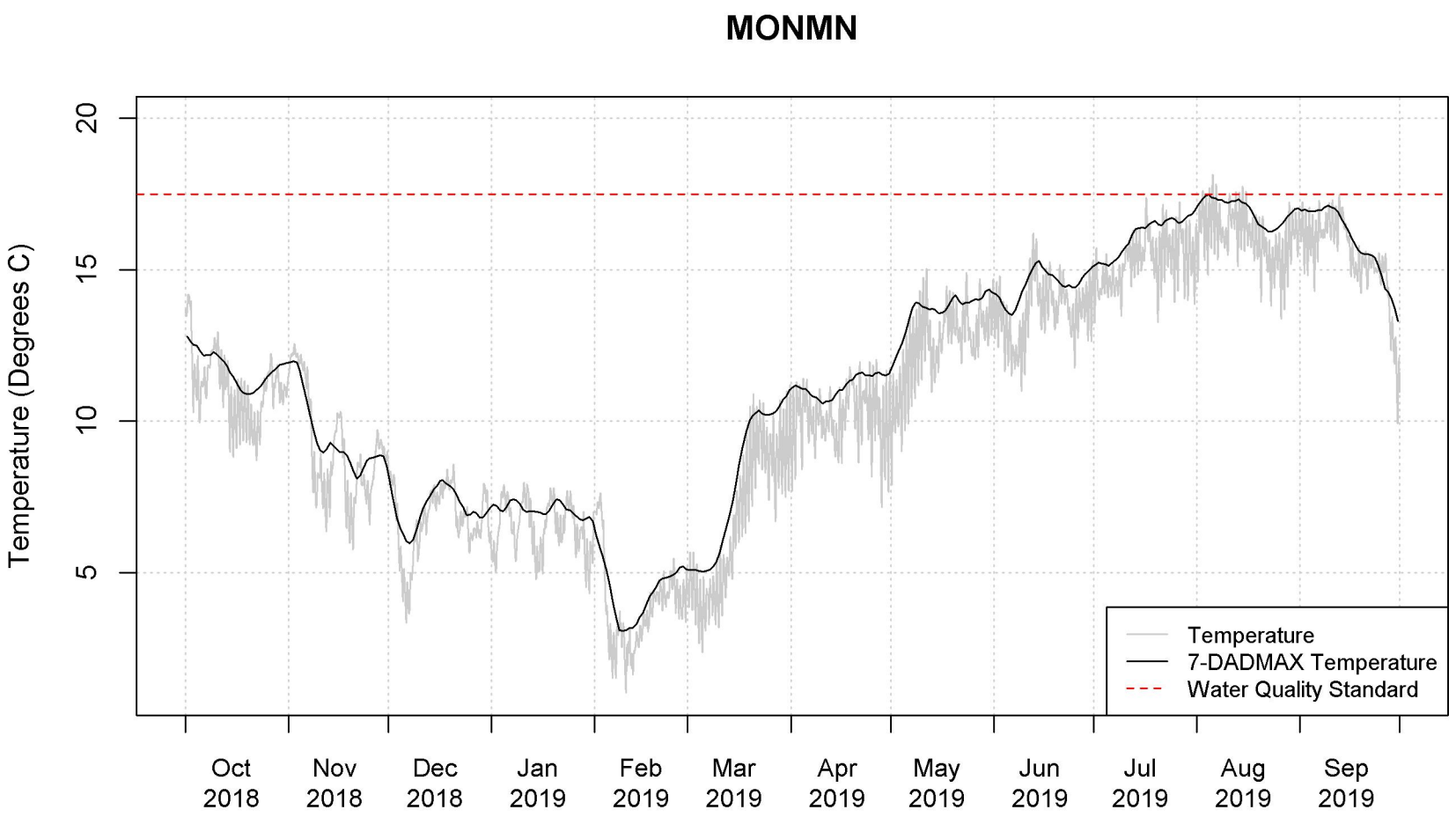


Figure J-4. Continuous Temperature and 7-DADMAX Measured at the MONMN Station.

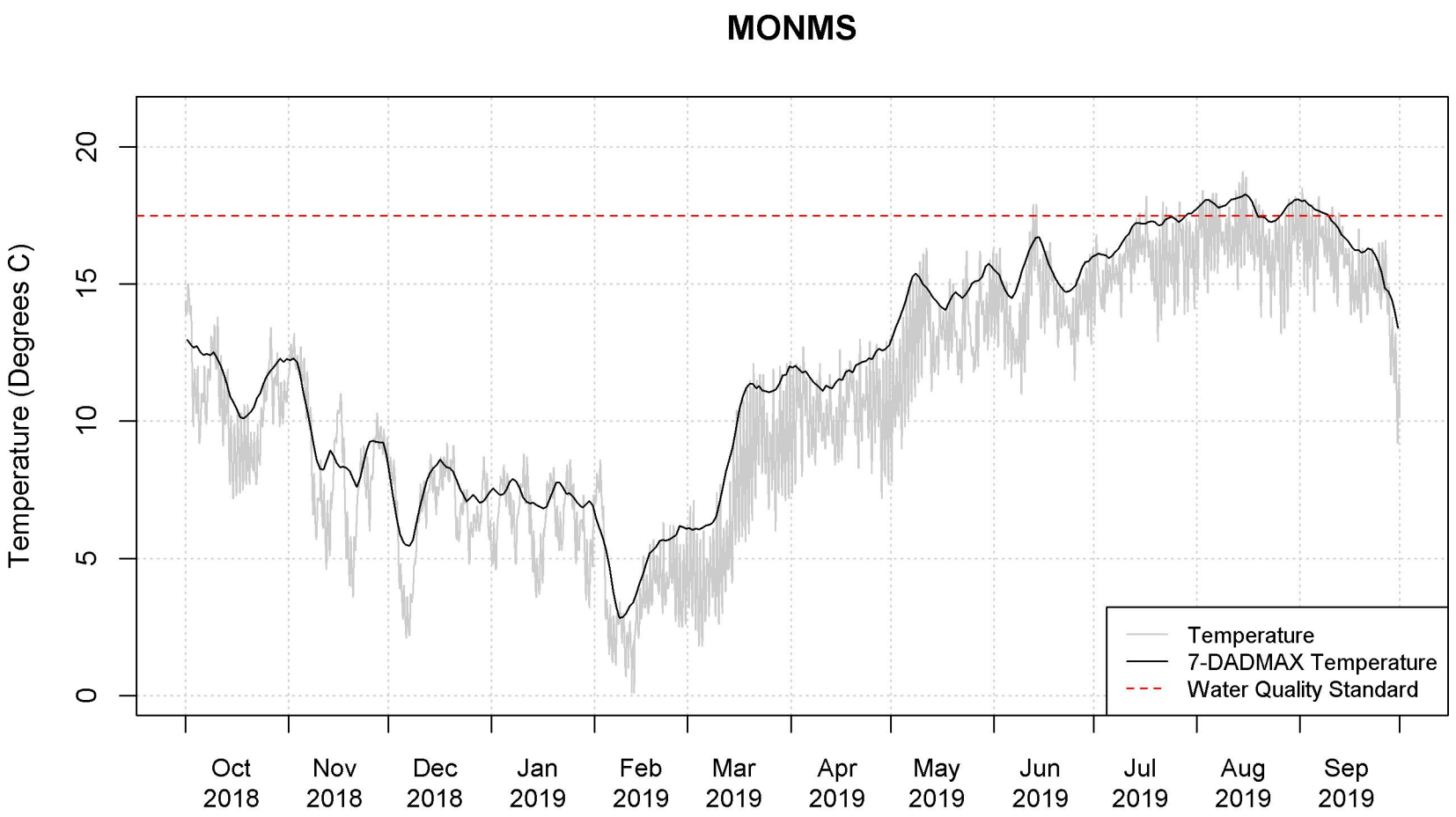


Figure J-5. Continuous Temperature and 7-DADMAX Measured at the MONMS Station.

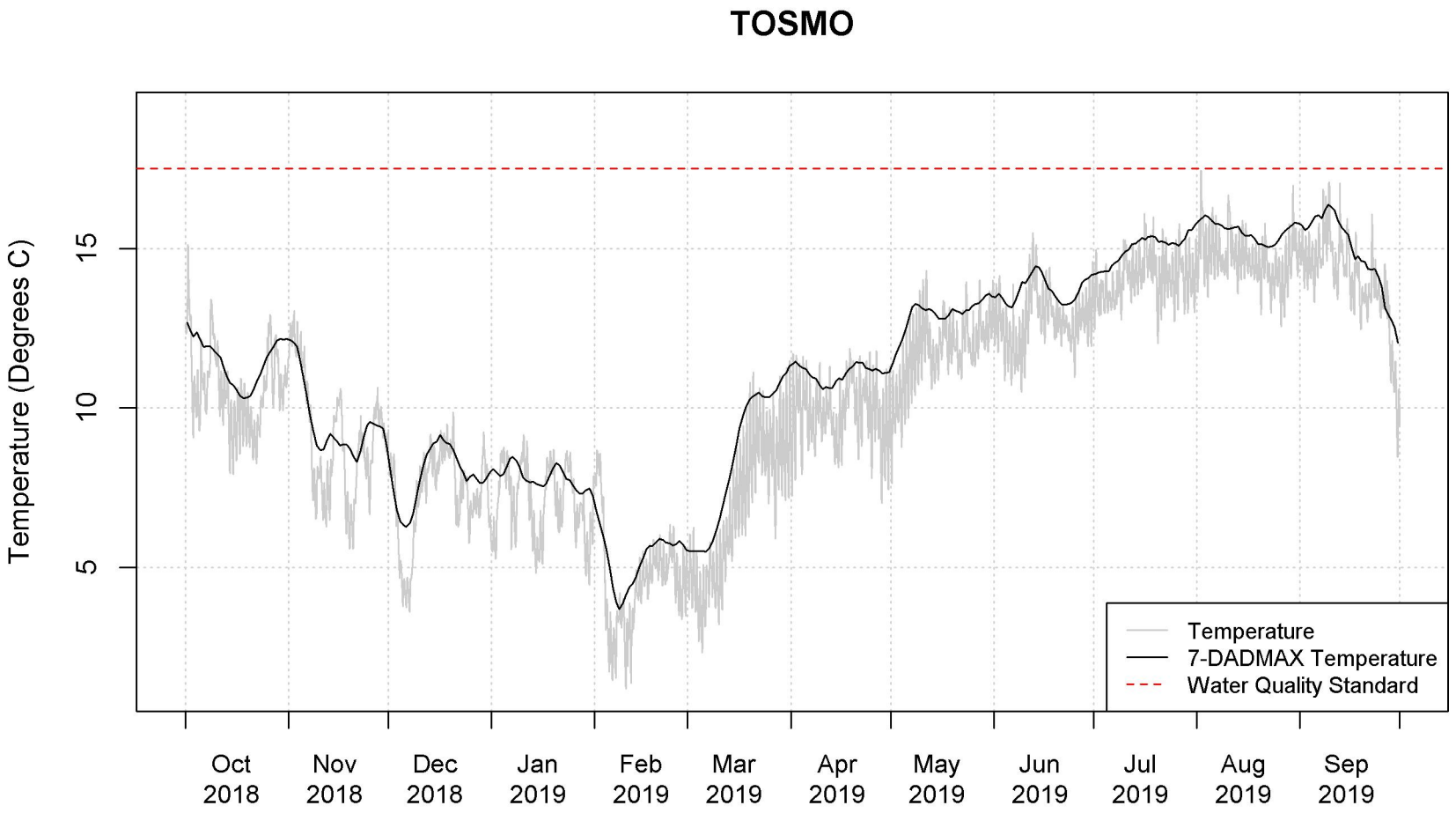


Figure J-6. Continuous Temperature and 7-DADMAX Measured at the TOSMO Station.

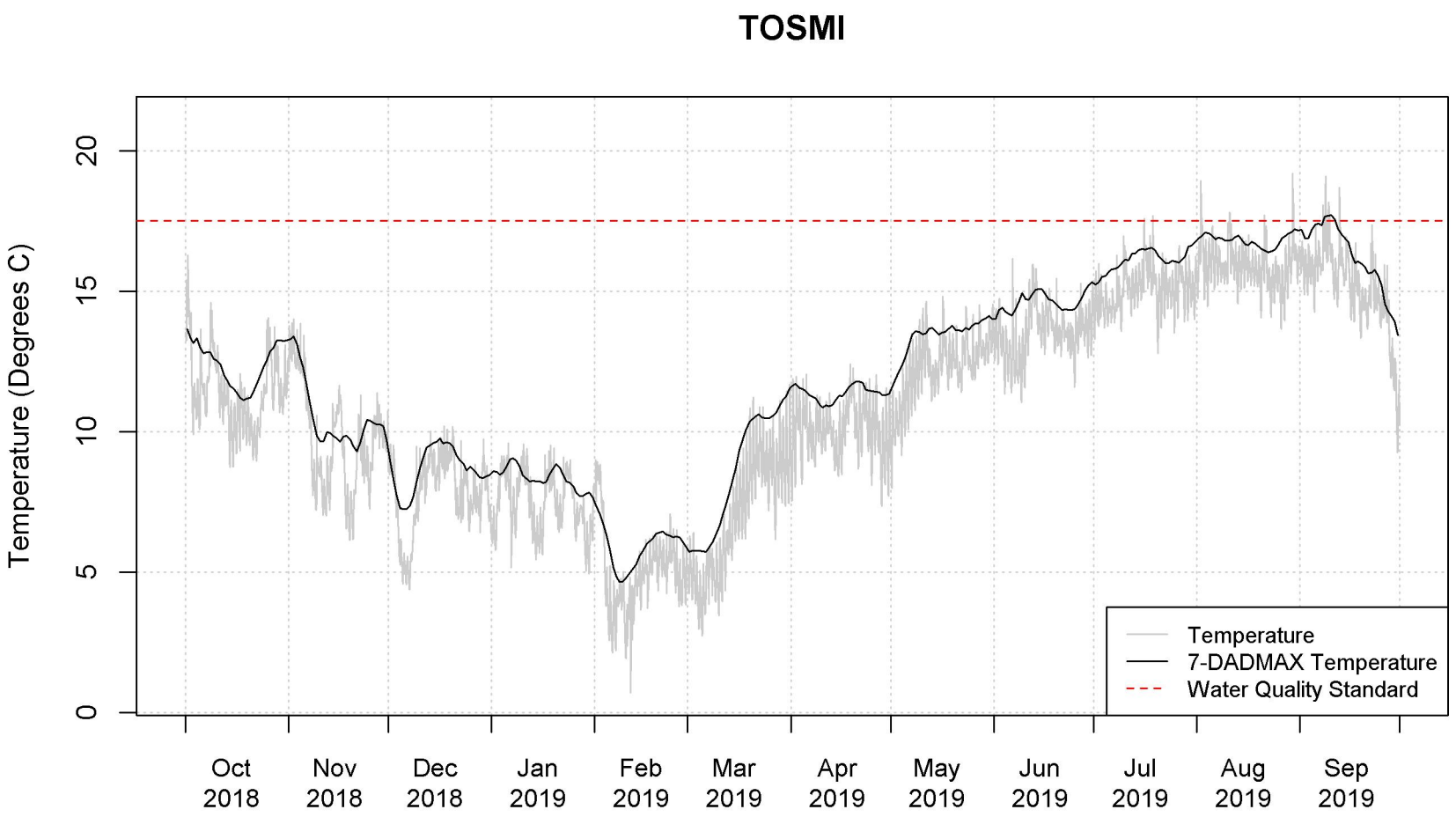


Figure J-7. Continuous Temperature and 7-DADMAX Measured at the TOSMI Station.

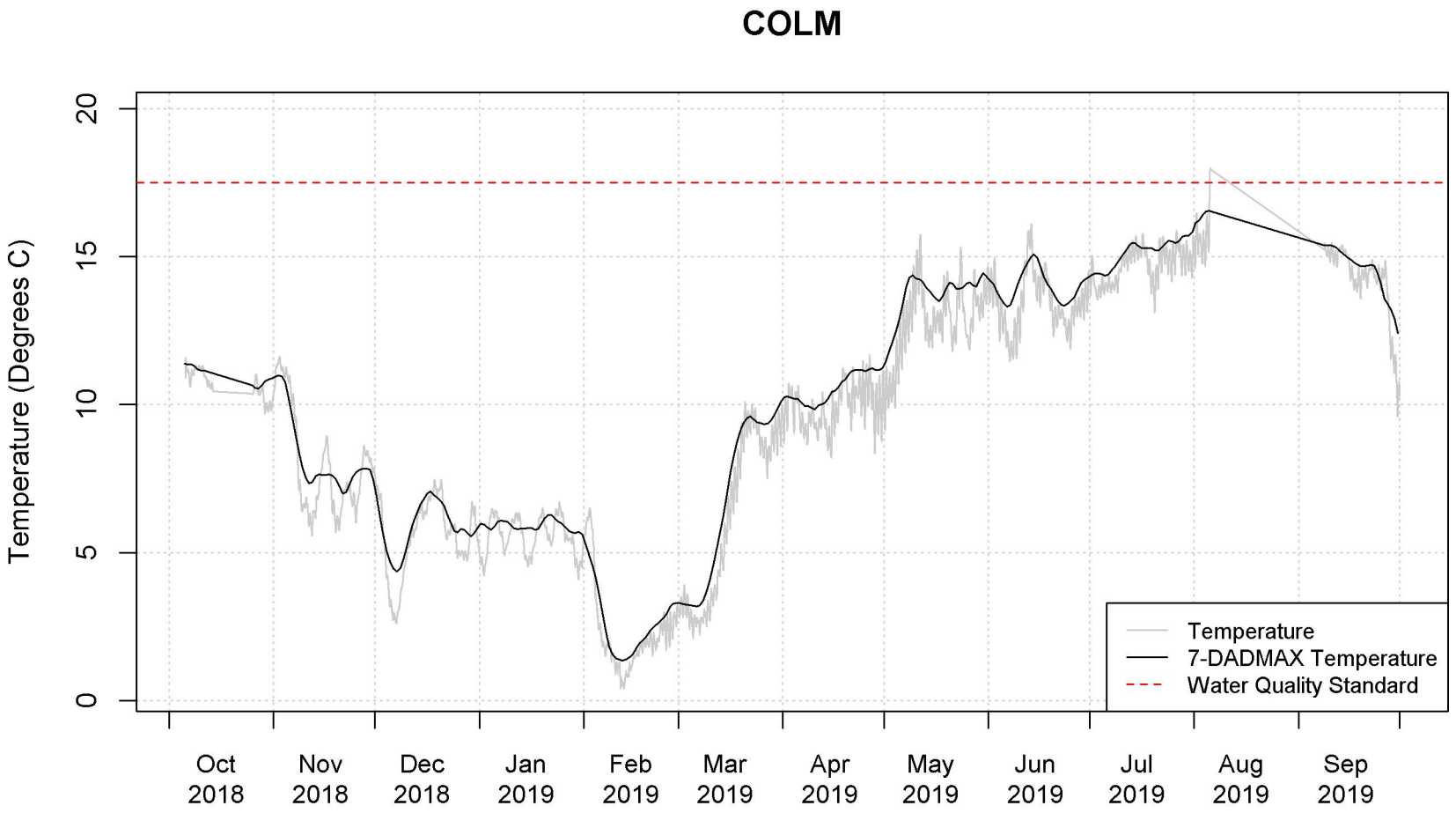


Figure J-8. Continuous Temperature and 7-DADMAX Measured at the COLM Station.

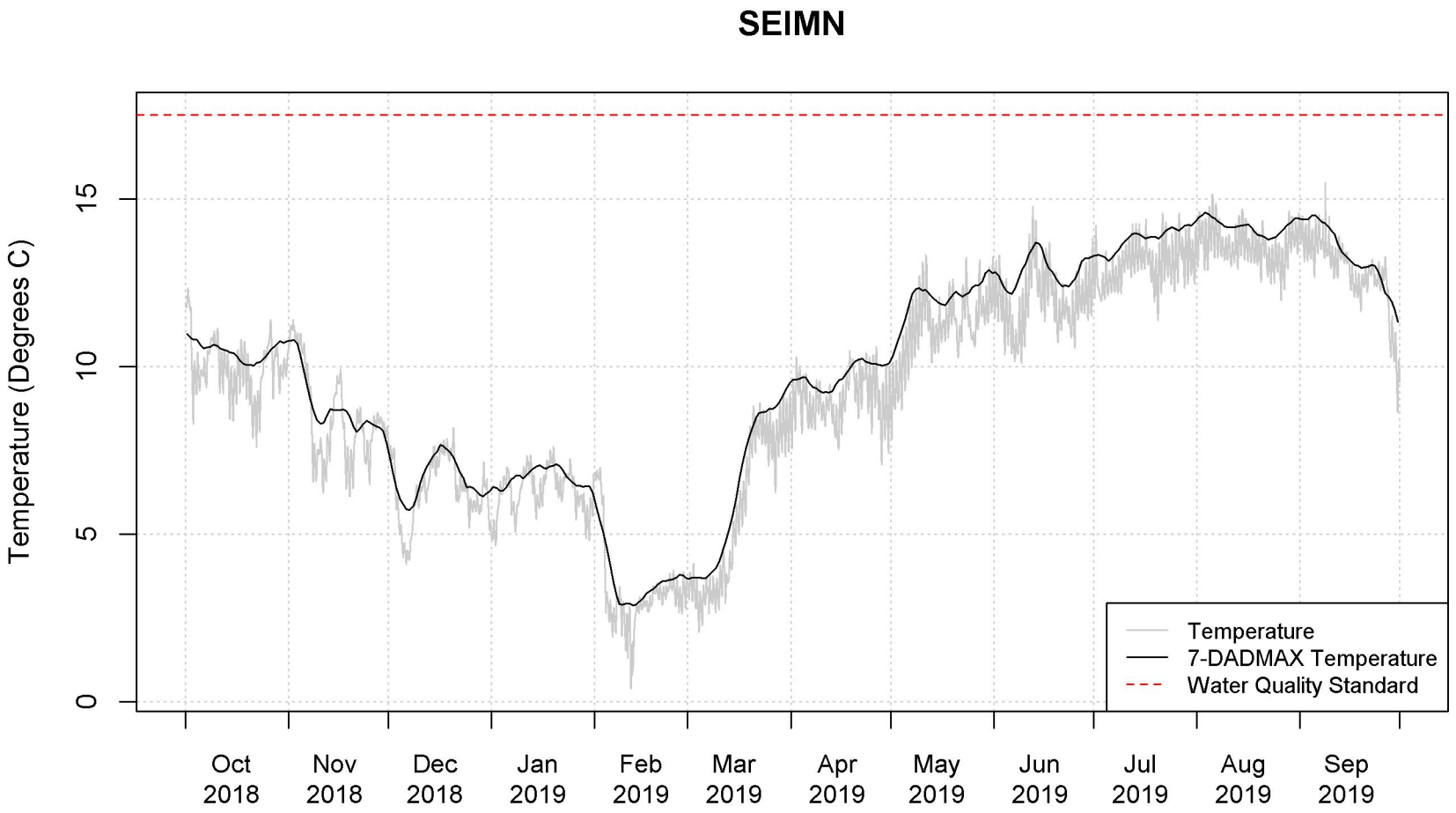


Figure J-9. Continuous Temperature and 7-DADMAX Measured at the SEIMN Station.

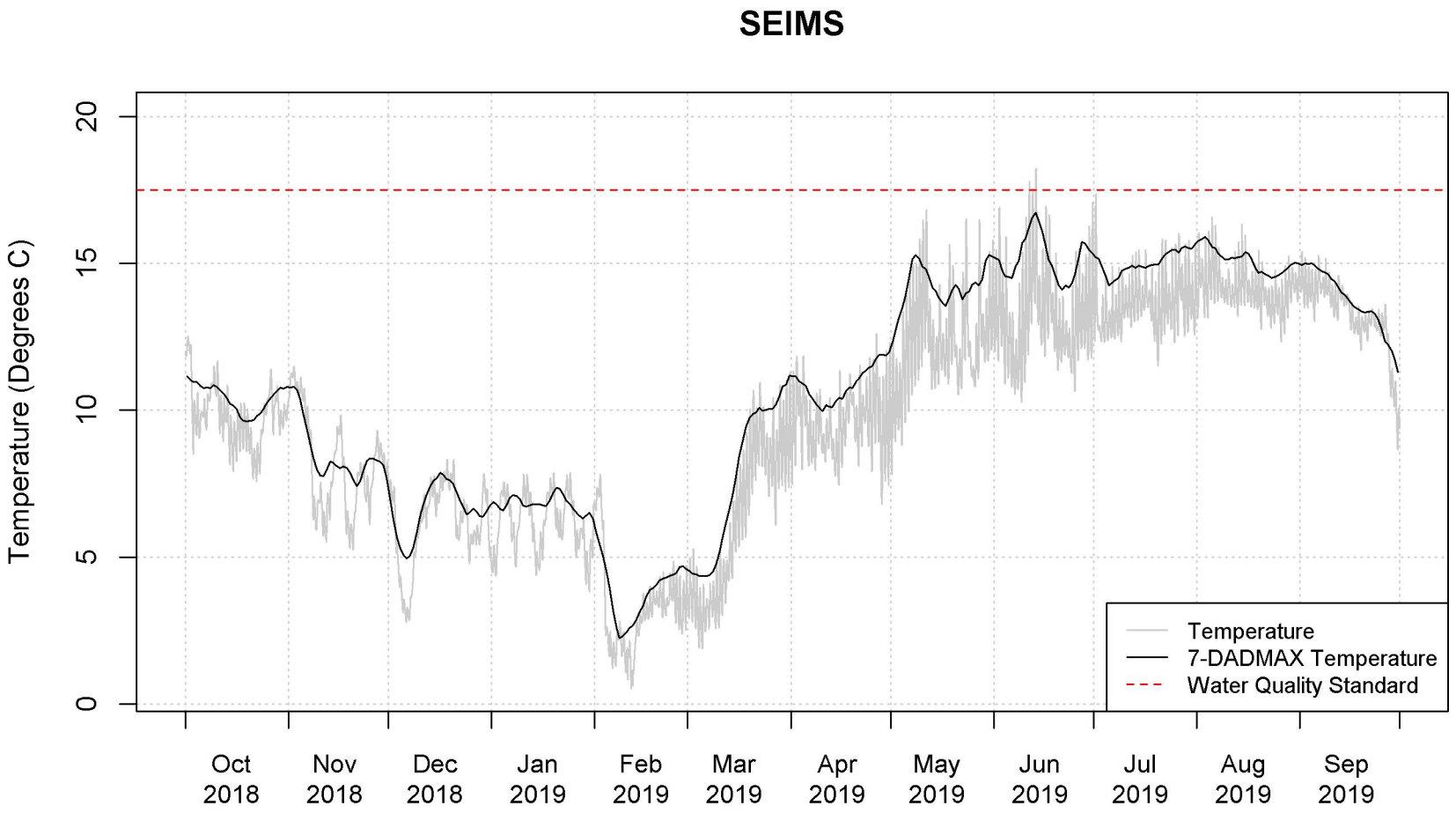


Figure J-10. Continuous Temperature and 7-DADMAX Measured at the SEIMS Station.

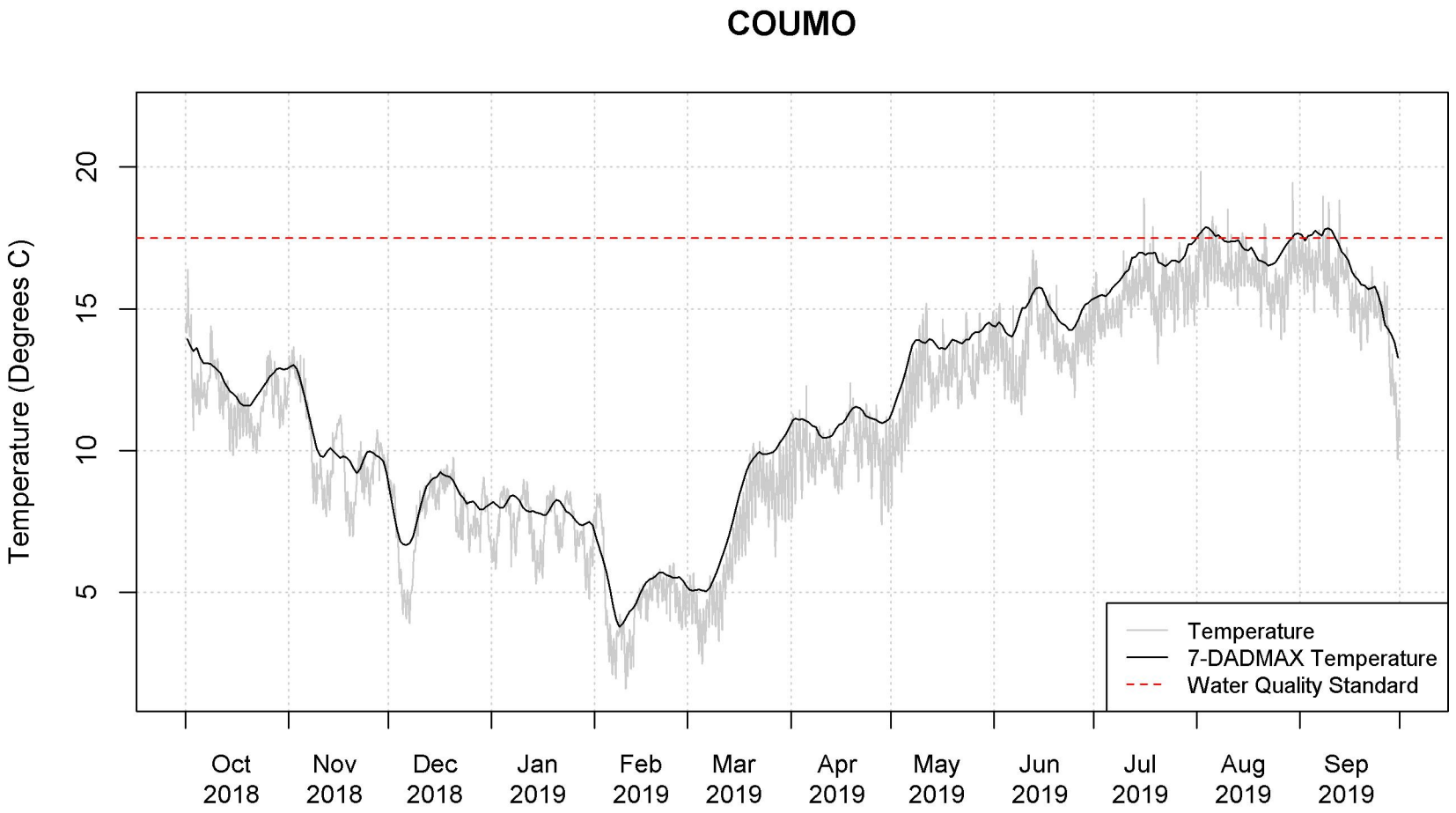


Figure J-11. Continuous Temperature and 7-DADMAX Measured at the COUMO Station.

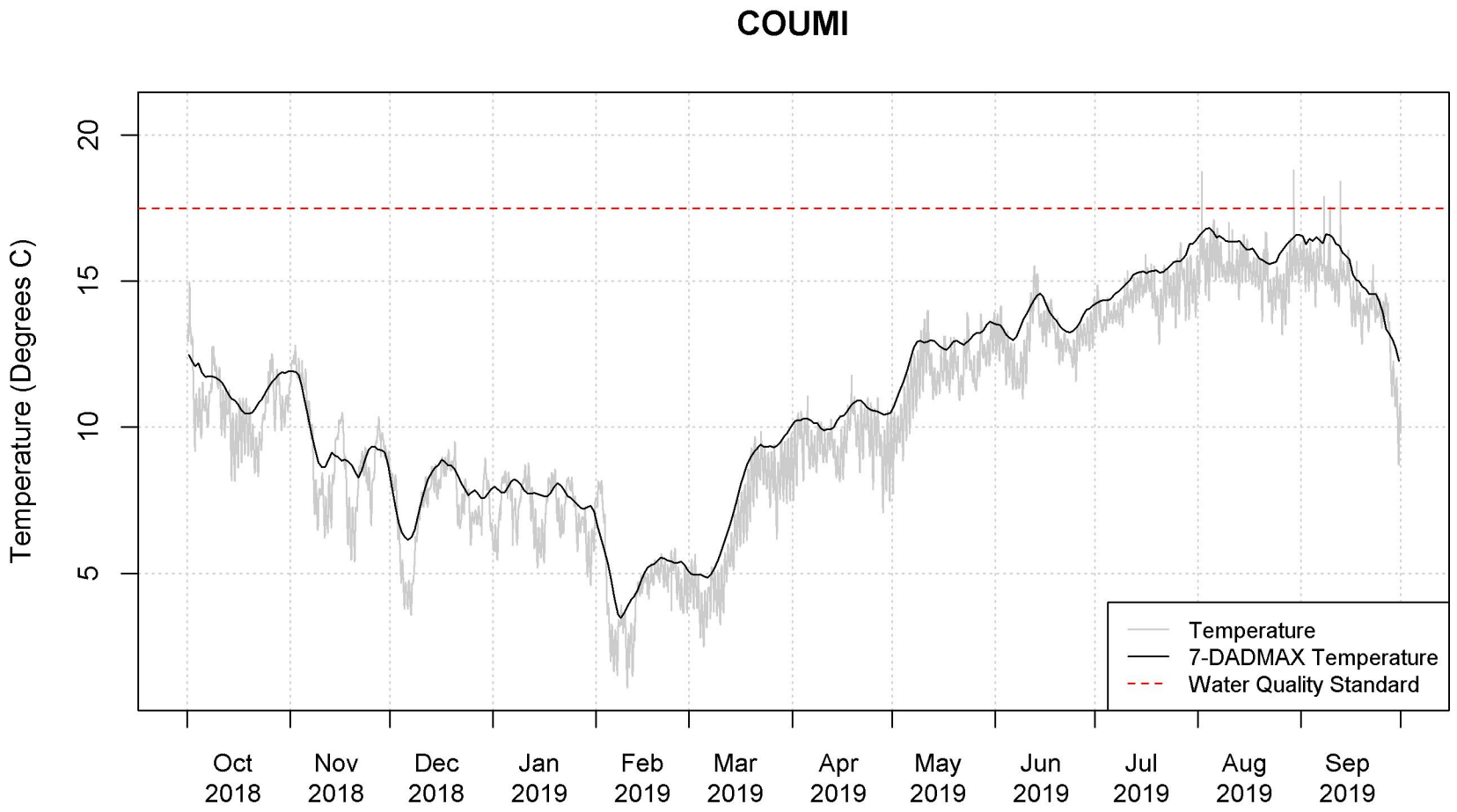


Figure J-12. Continuous Temperature and 7-DADMAX Measured at the COUMI Station.

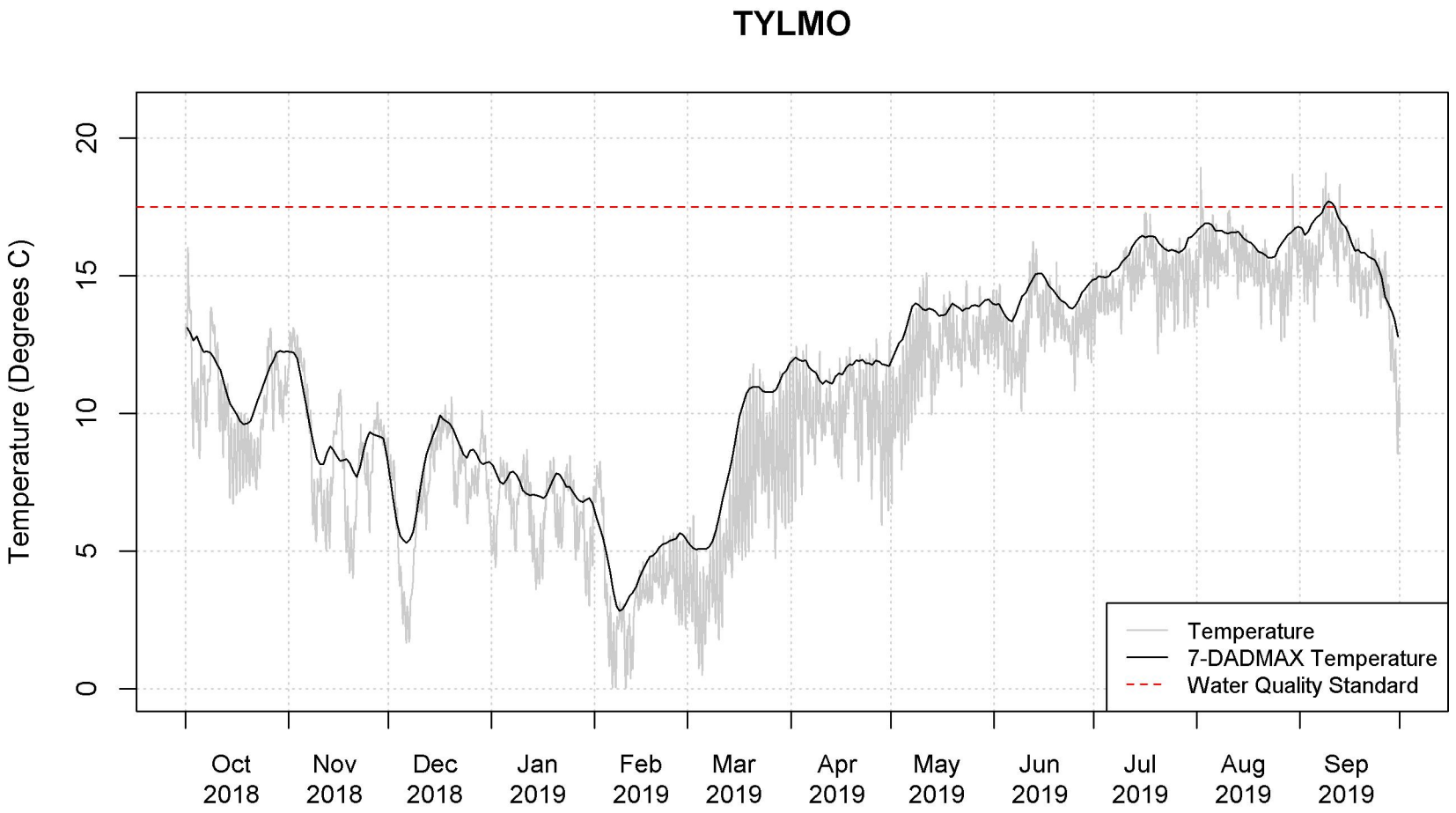


Figure J-13. Continuous Temperature and 7-DADMAX Measured at the TYLMO Station.

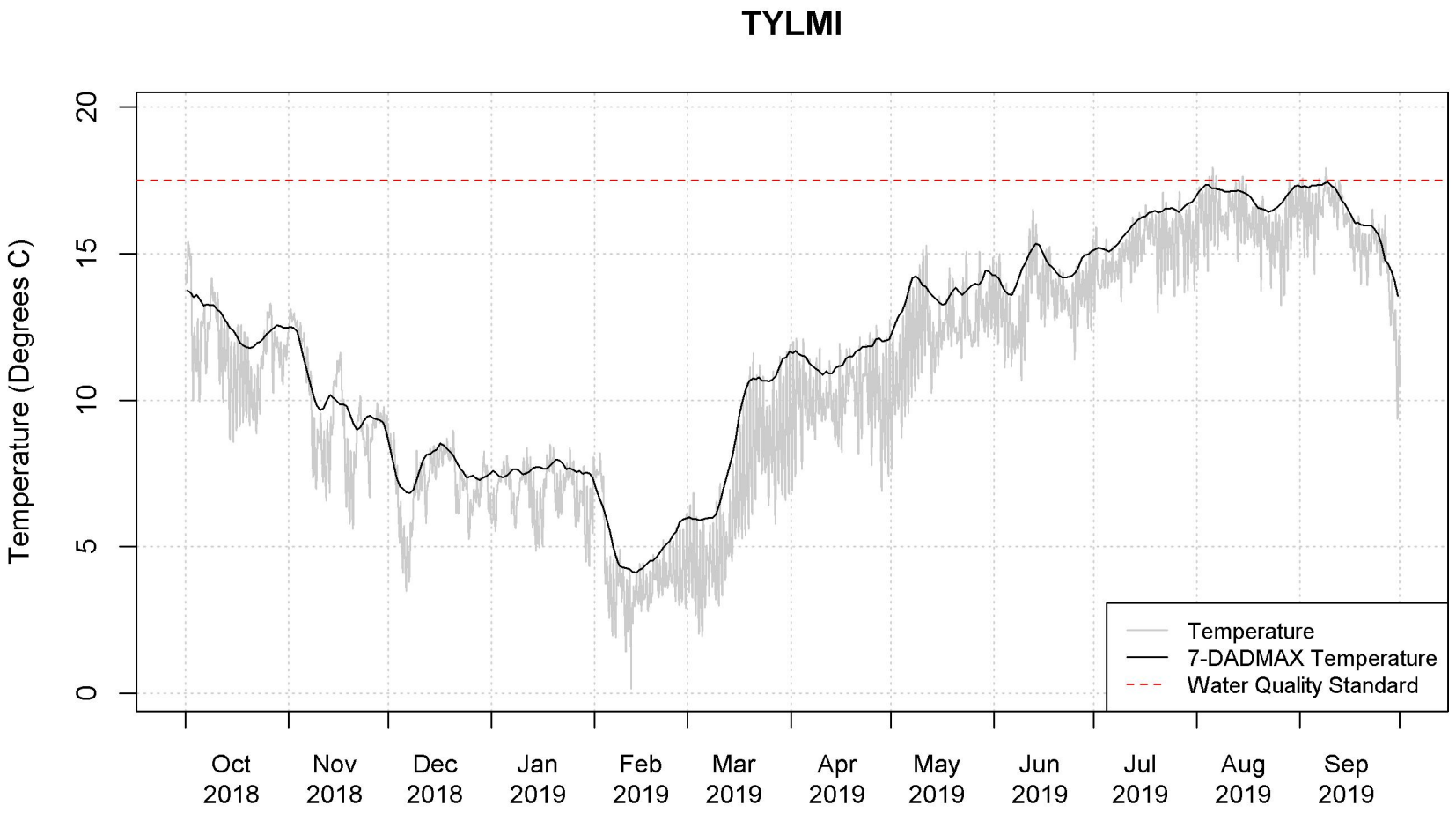


Figure J-14. Continuous Temperature and 7-DADMAX Measured at the TYLMI Station.

APPENDIX K

Line Plots Showing Continuous Conductivity Data

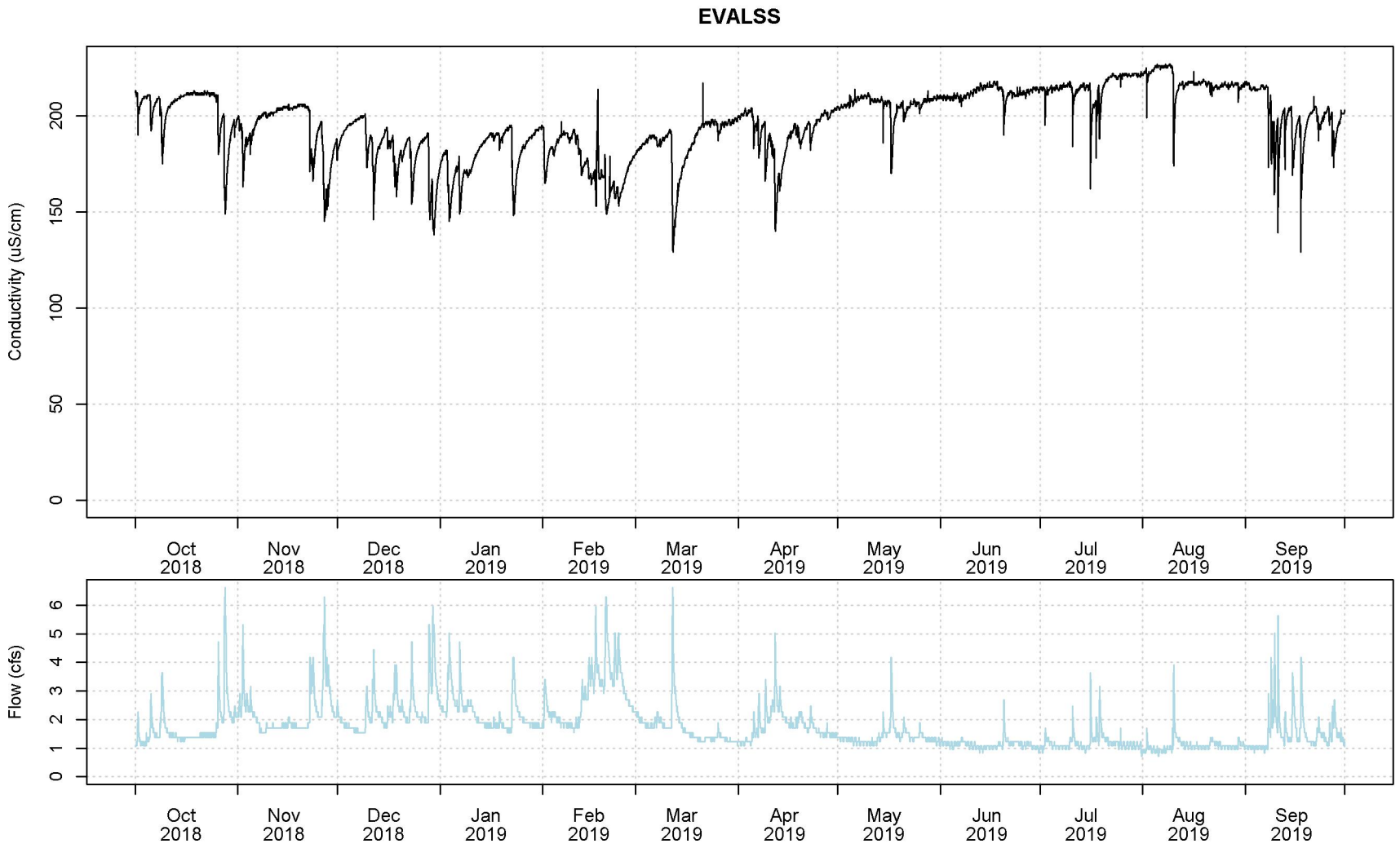


Figure K-1. Continuous Conductivity Measured at the EVALSS Station.

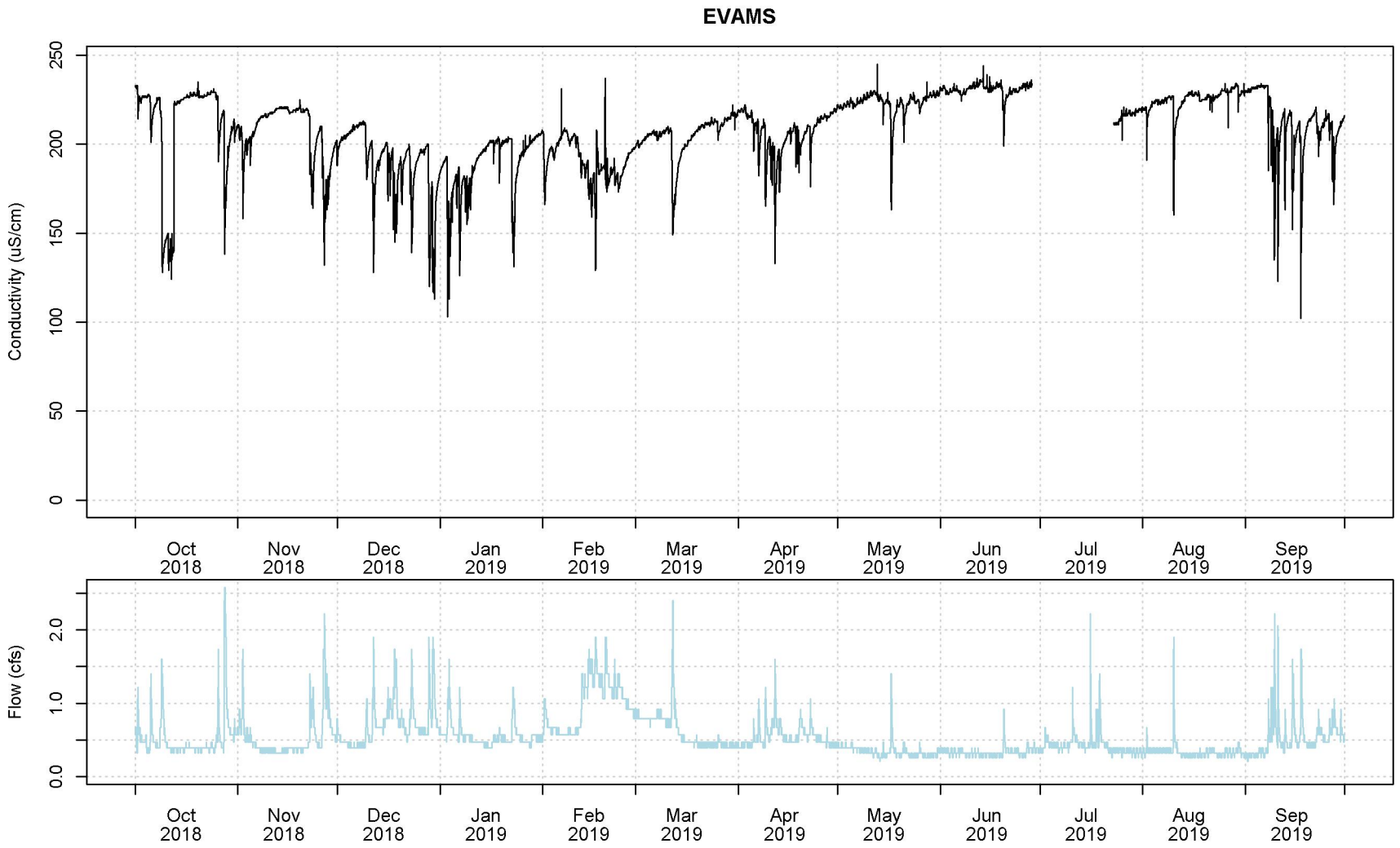


Figure K-2. Continuous Conductivity Measured at the EVAMS Station.

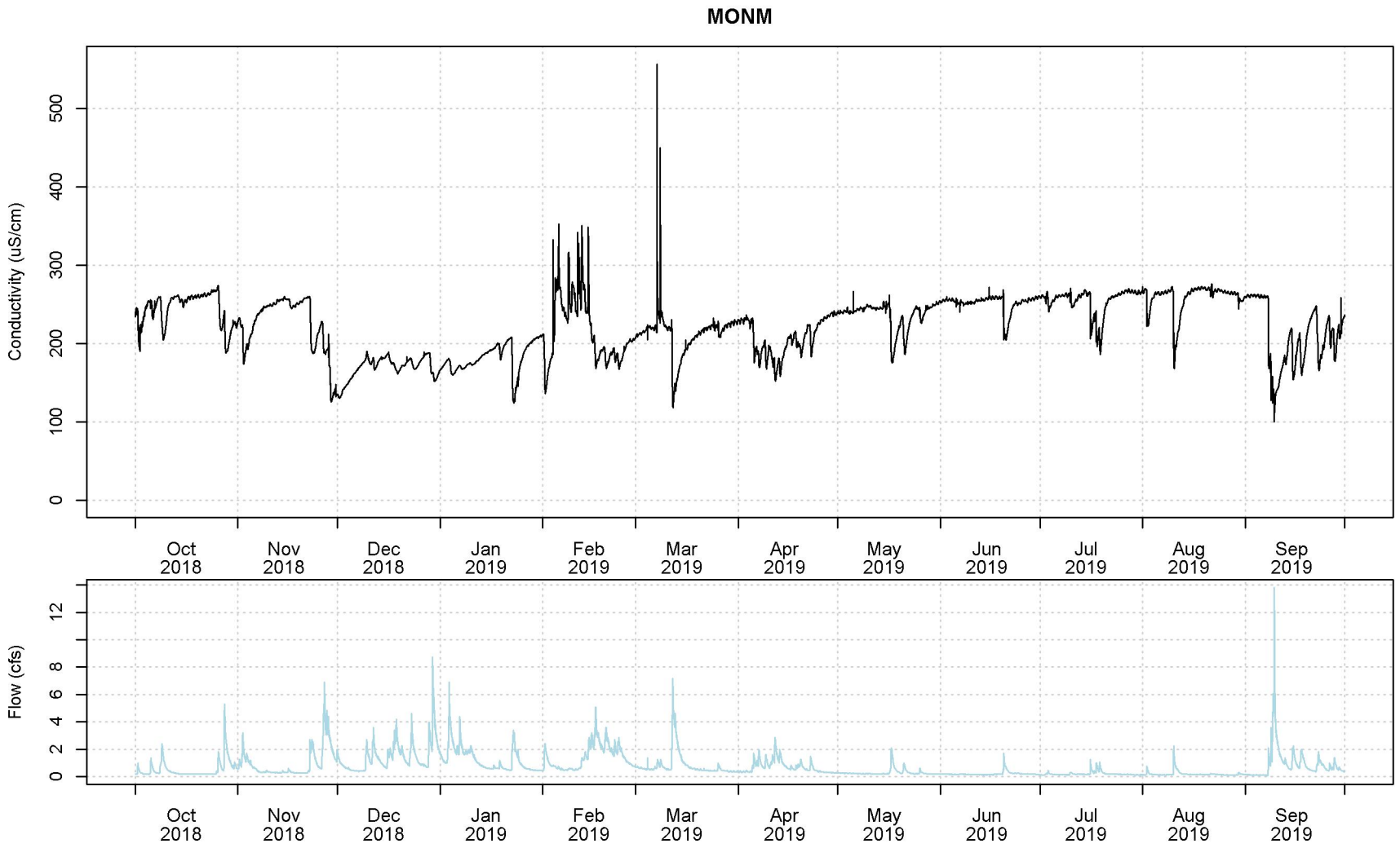


Figure K-3. Continuous Conductivity Measured at the MONM Station.

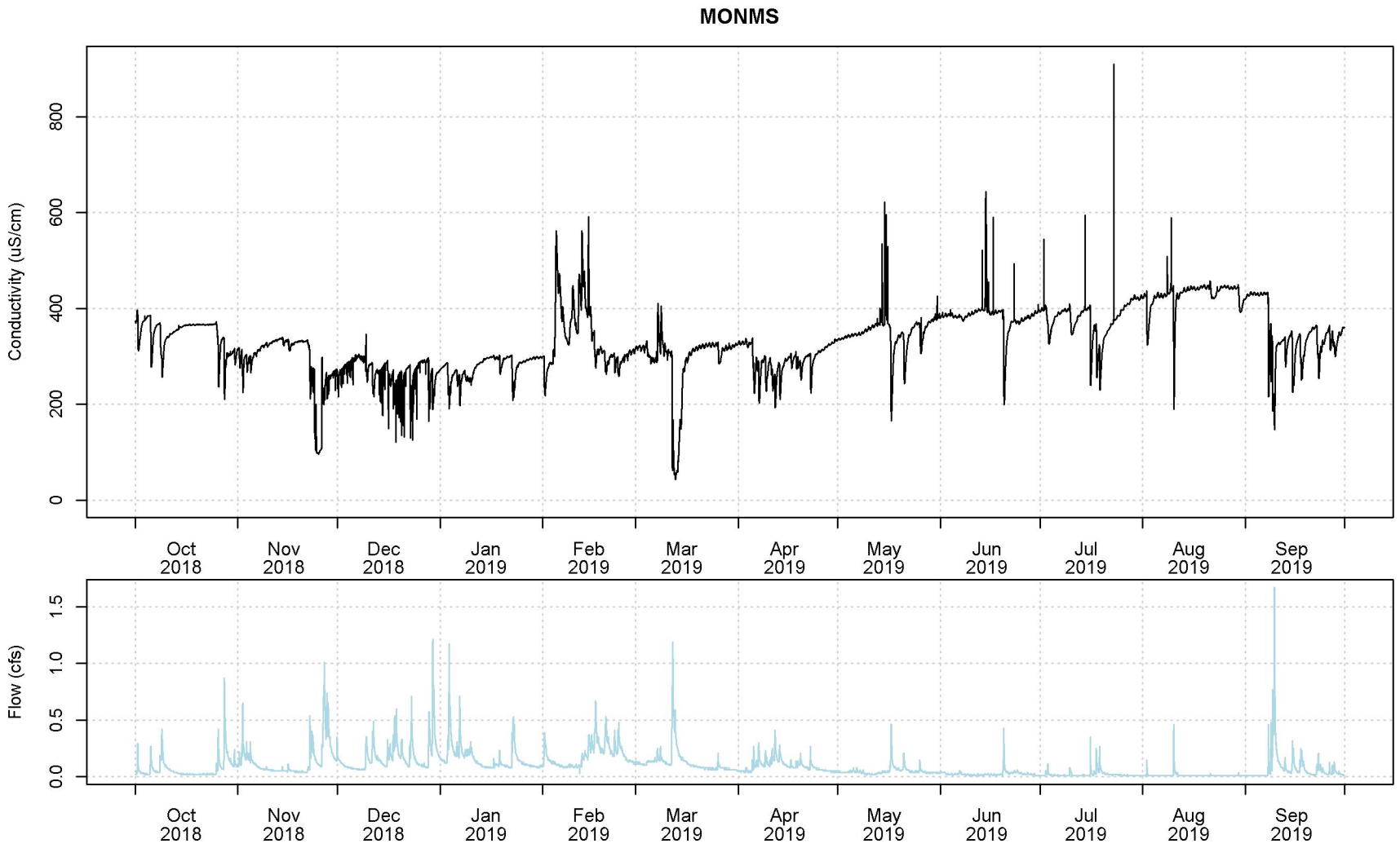


Figure K-4. Continuous Conductivity Measured at the MONMS Station.

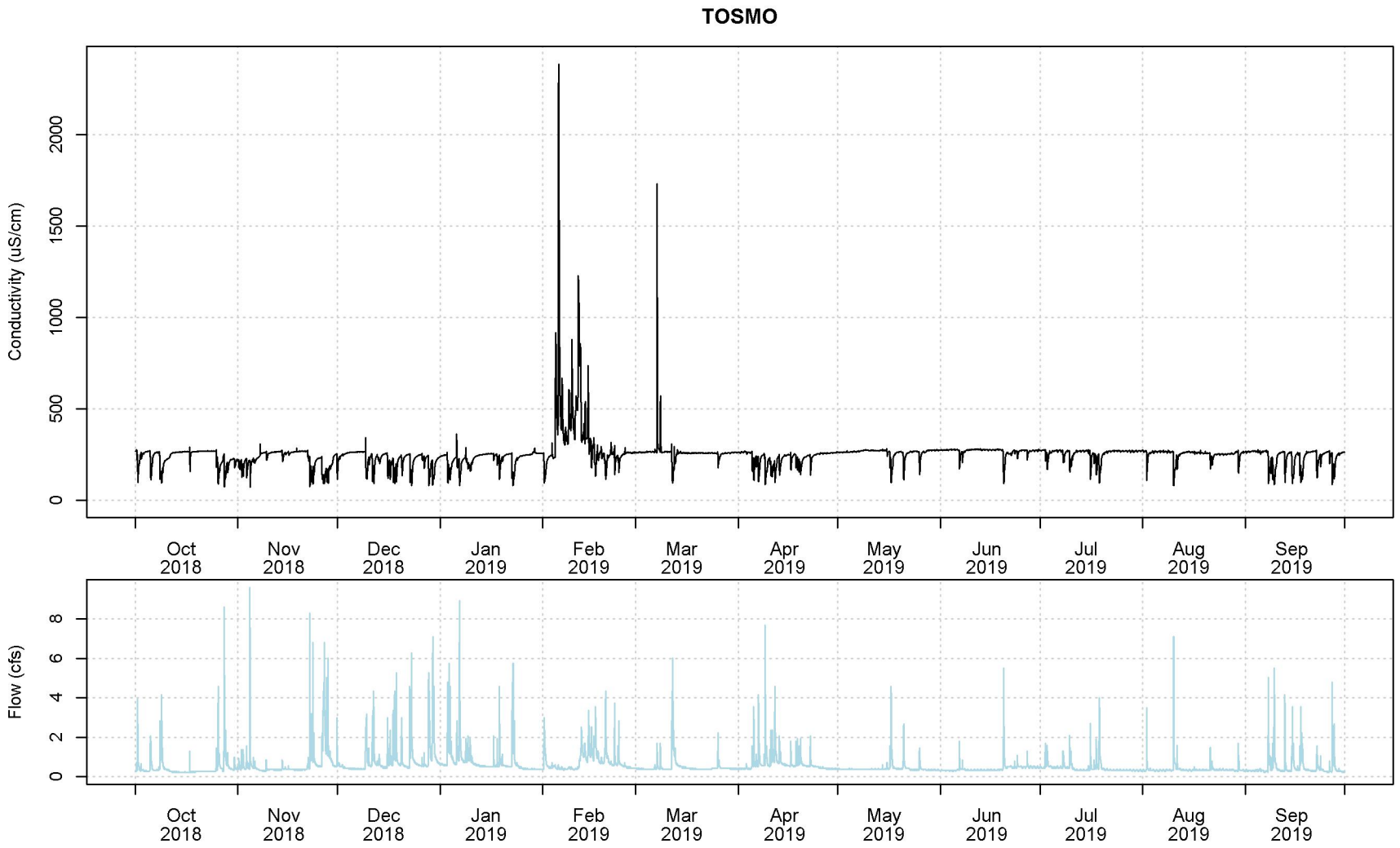


Figure K-5. Continuous Conductivity Measured at the TOSMO Station.

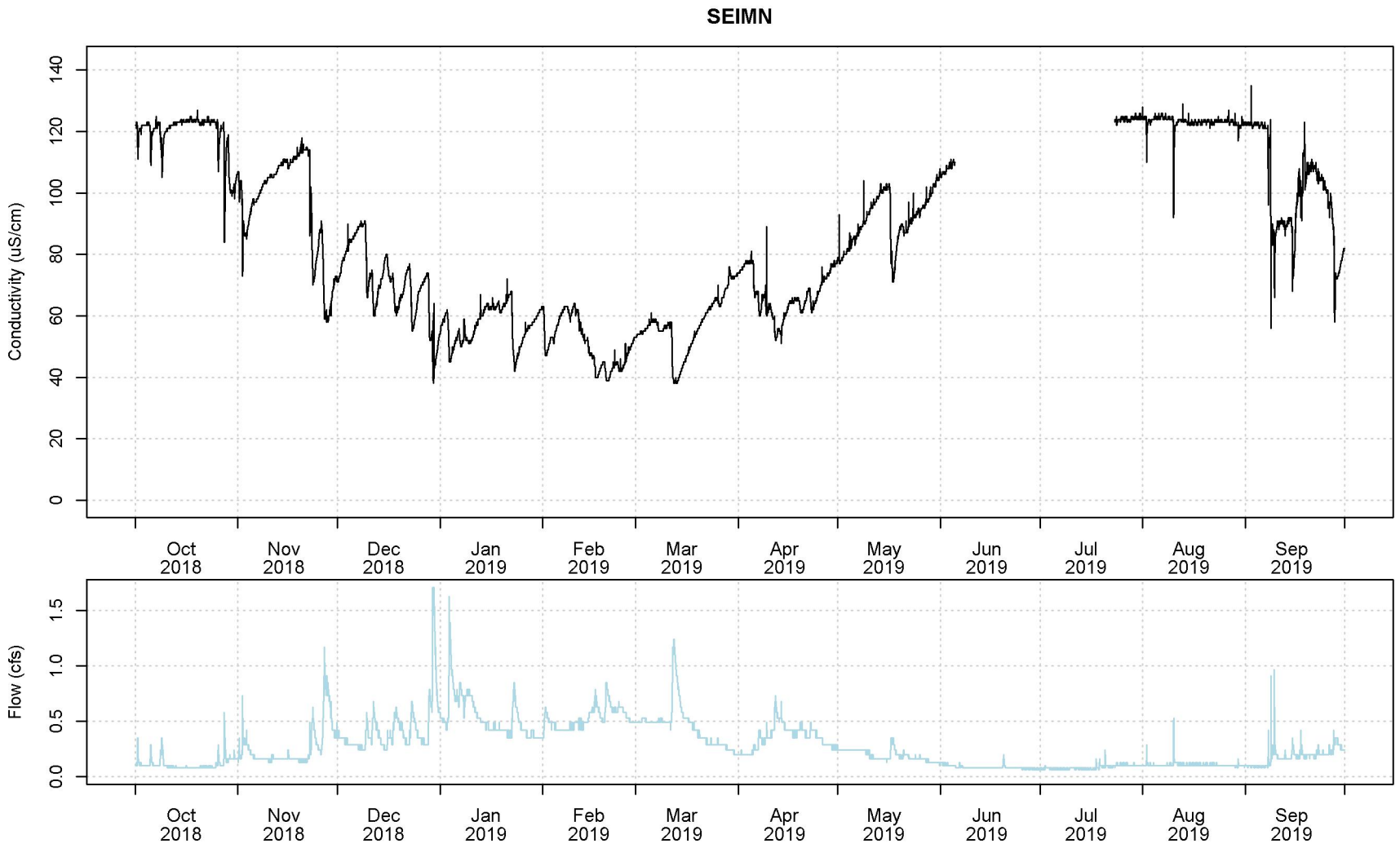


Figure K-6. Continuous Conductivity Measured at the SEIMN Station.

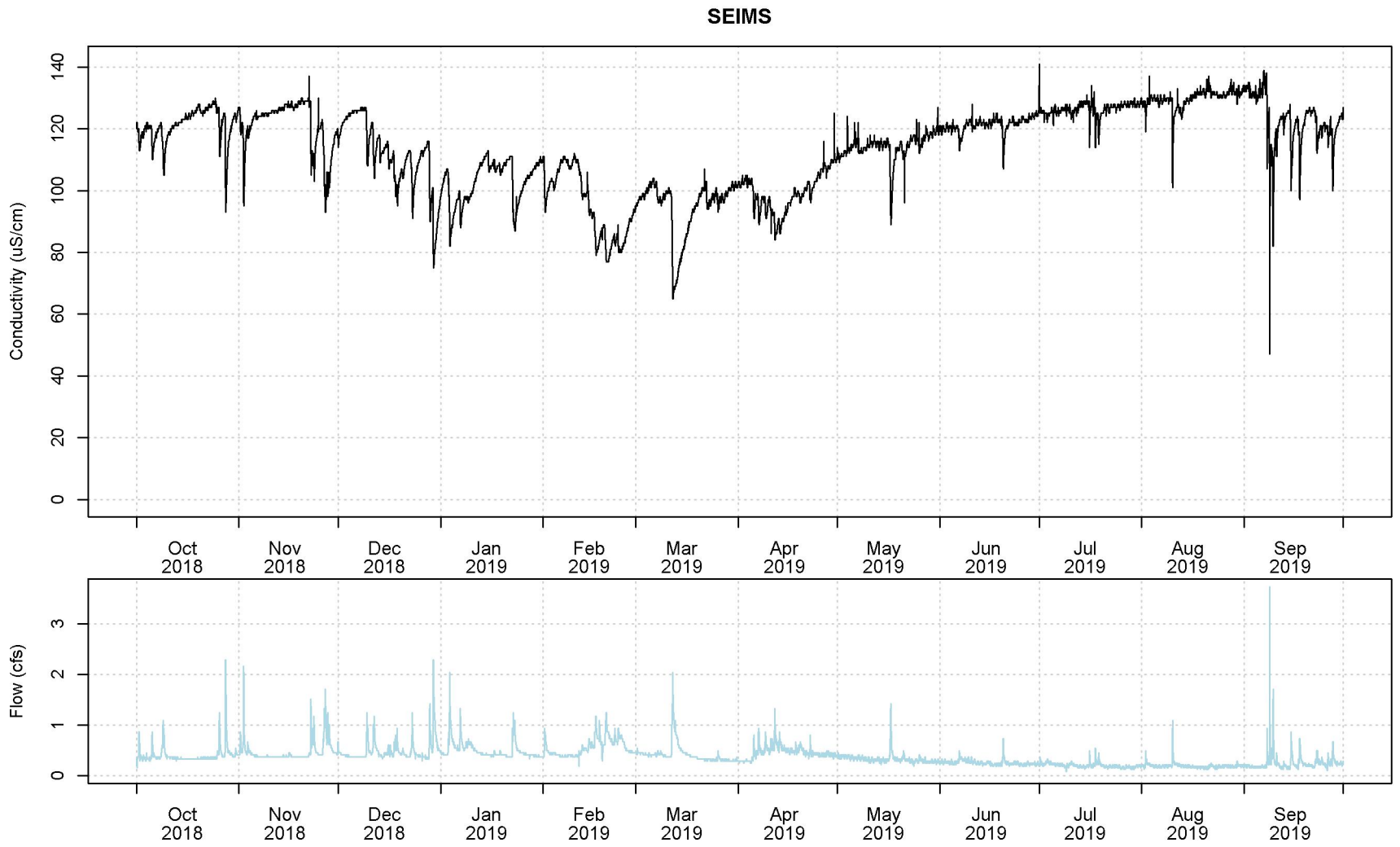


Figure K-7. Continuous Conductivity Measured at the SEIMS Station.

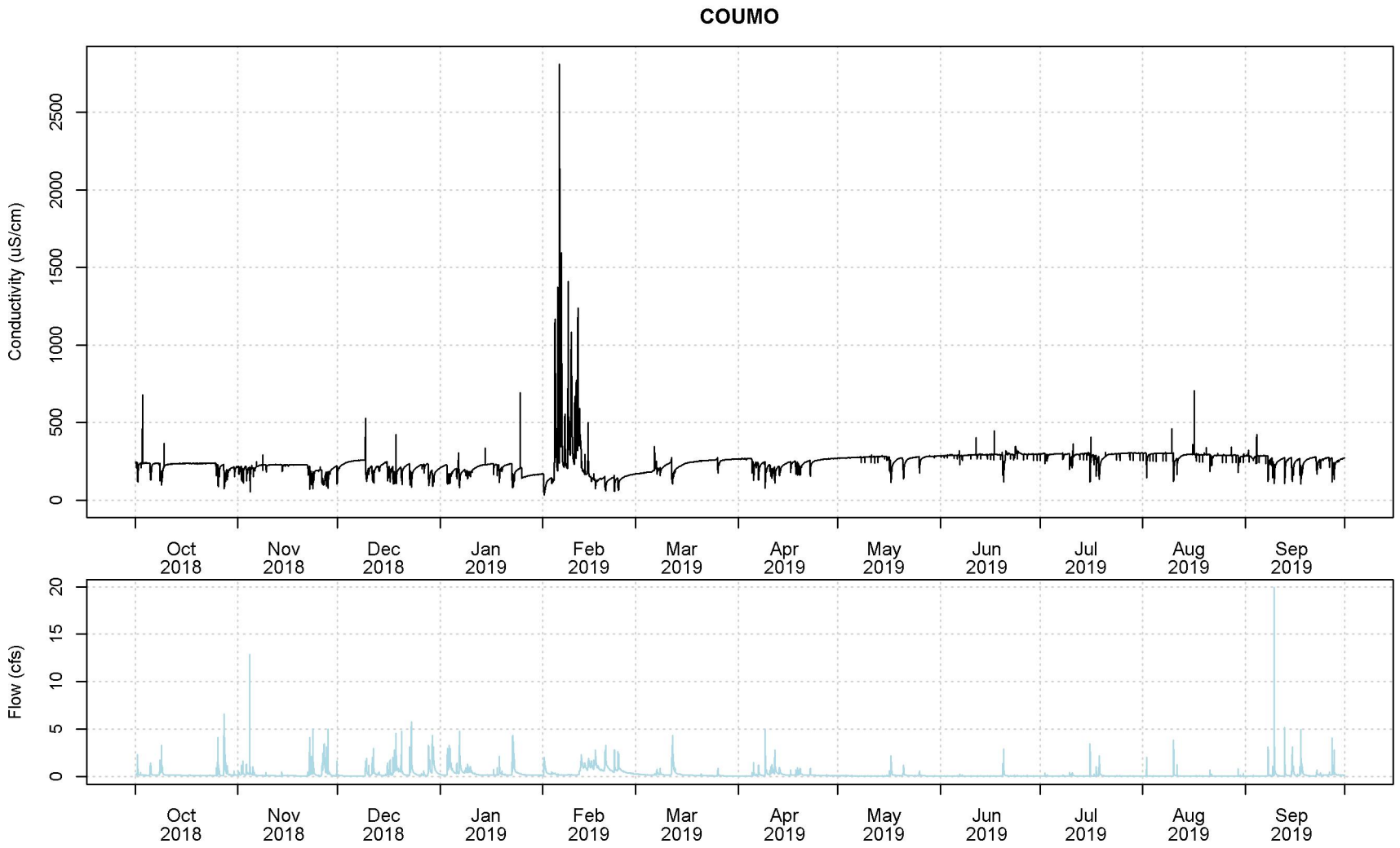


Figure K-8. Continuous Conductivity Measured at the COUMO Station.

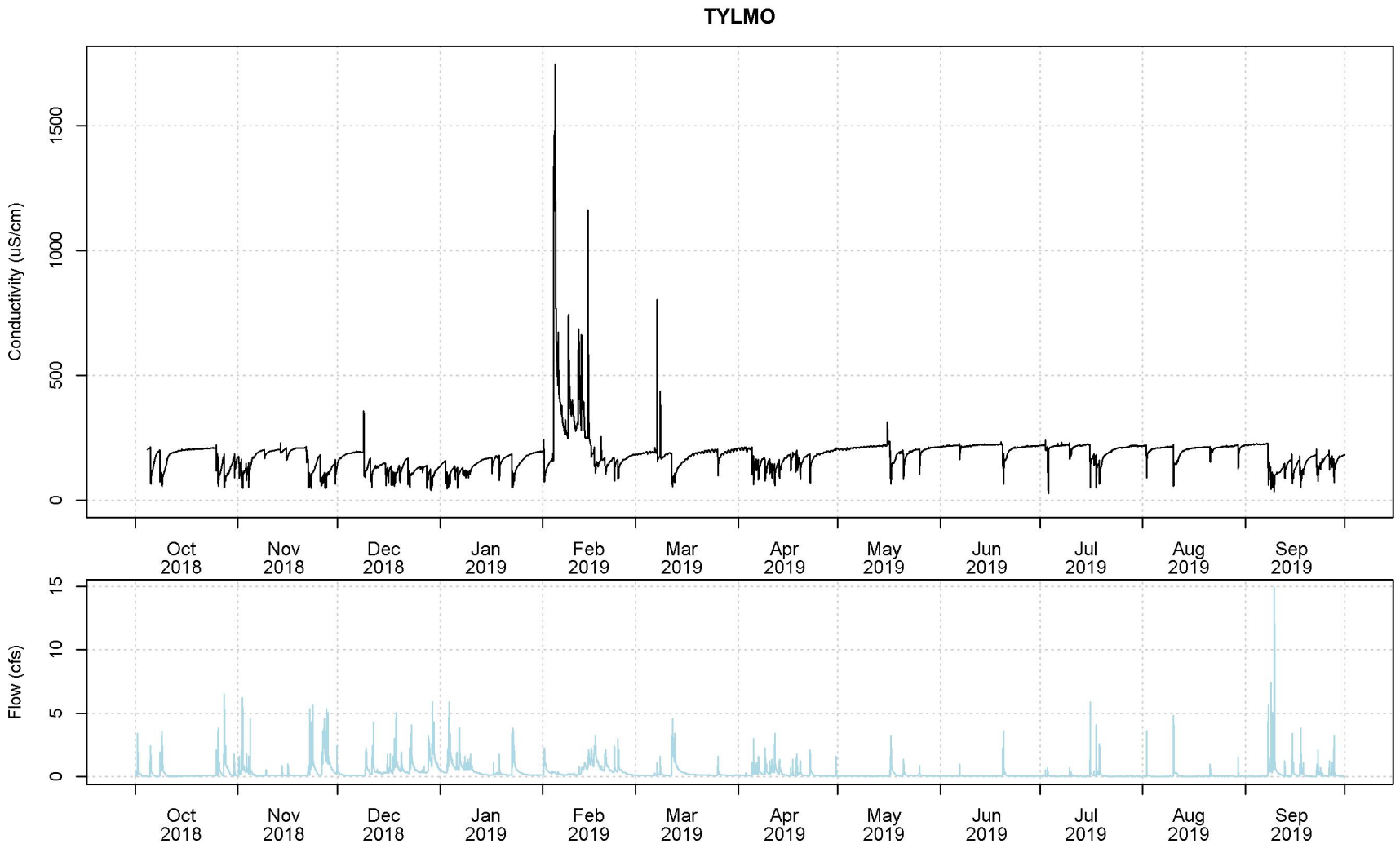


Figure K-9. Continuous Conductivity Measured at the TYLMO Station.

APPENDIX L

Compiled Field Data from Physical Habitat Monitoring

The contents of this appendix are provided in an electronic file only.

APPENDIX M

Computed Physical Habitat Quality Indicators

The contents of this appendix are provided in an electronic file only.

APPENDIX N

Summary Statistics for Evaluating Physical Habitat Quality Indicators

The contents of this appendix are provided in an electronic file only.

APPENDIX O

Laboratory Reports and Data Quality Assurance Audit Forms for Sediment Quality Monitoring

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 12, 2019

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1907-225

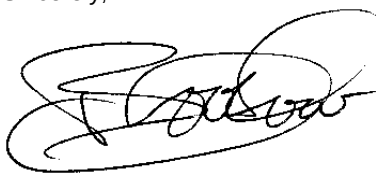
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 19, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

Case Narrative

Samples were collected on July 11, 12 and 19, 2019 and received by the laboratory on July 19, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 6010D Analysis

The liquid portion of the sample was decanted and only the solid portion was analyzed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-SR-2019**					
Laboratory ID:	07-225-03					
Total Organic Carbon	**7.9**	0.42	EPA 9060A	8-6-19	8-6-19	
Client ID:	**TOSH-2R-2019**					
Laboratory ID:	07-225-07					
Total Organic Carbon	**2.3**	0.11	EPA 9060A	8-7-19	8-7-19	
Client ID:	**TOSH-1R-2019**					
Laboratory ID:	07-225-09					
Total Organic Carbon	**2.3**	0.19	EPA 9060A	8-6-19	8-6-19	

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Solid
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0806S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-6-19	8-6-19	
Laboratory ID:	MB0807S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-7-19	8-7-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-225-09								
	ORIG	DUP							
Total Organic Carbon	**2.32**	**2.63**	NA	NA	NA	NA	13	20	
Laboratory ID:	07-225-07								
	ORIG	DUP							
Total Organic Carbon	**2.31**	**2.43**	NA	NA	NA	NA	5	20	
SPIKE BLANK									
Laboratory ID:	SB0806S1								
	SB		SB		SB				
Total Organic Carbon	**43.2**		42.1	NA	103	90-121	NA	NA	
Laboratory ID:	SB0807S1								
	SB		SB		SB				
Total Organic Carbon	**41.8**		42.1	NA	99	90-121	NA	NA	

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

TOTAL METALS
EPA 6010D

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-SM-2019**					
Laboratory ID:	07-225-04					
Copper	**35**	7.1	EPA 6010D	9-11-19	9-11-19	
Zinc	**220**	18	EPA 6010D	9-11-19	9-11-19	
Client ID:	**TOSH-2M-2019**					
Laboratory ID:	07-225-08					
Copper	**30**	2.1	EPA 6010D	9-11-19	9-11-19	
Zinc	**470**	5.2	EPA 6010D	9-11-19	9-11-19	
Client ID:	**TOSH-1M-2019**					
Laboratory ID:	07-225-10					
Copper	**27**	2.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**390**	5.0	EPA 6010D	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911SM4					
Copper	**ND**	1.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**ND**	2.5	EPA 6010D	9-11-19	9-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-225-04										
	ORIG	DUP									
Copper	**4.85**	**4.28**	NA	NA		NA		NA	13	20	
Zinc	**30.7**	**29.5**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	07-225-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**52.8**	**53.6**	50.0	50.0	4.85	**96**	**97**	75-125	2	20	
Zinc	**118**	**120**	100	100	30.7	**87**	**90**	75-125	2	20	

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-SR-2019**					
Laboratory ID:	07-225-03					
Naphthalene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
2-Methylnaphthalene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
1-Methylnaphthalene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Dimethylphthalate	**ND**	0.17	EPA 8270D	7-24-19	8-8-19	
Acenaphthylene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Acenaphthene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Diethylphthalate	**ND**	0.17	EPA 8270D	7-24-19	8-8-19	
Fluorene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Phenanthrene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Anthracene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Di-n-butylphthalate	**ND**	0.17	EPA 8270D	7-24-19	8-8-19	
Fluoranthene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Pyrene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Butylbenzylphthalate	**ND**	0.17	EPA 8270D	7-24-19	8-8-19	
Benzo[a]anthracene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Chrysene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.17	EPA 8270D	7-24-19	8-8-19	
Di-n-octylphthalate	**ND**	0.17	EPA 8270D	7-24-19	8-8-19	
Benzo[b]fluoranthene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo(j,k)fluoranthene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo[a]pyrene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Dibenz[a,h]anthracene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo[g,h,i]perylene	**ND**	0.033	EPA 8270D/SIM	7-24-19	7-29-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***53***	***21 - 107***				
Phenol-d6	***68***	***30 - 106***				
Nitrobenzene-d5	***60***	***28 - 109***				
2-Fluorobiphenyl	***76***	***37 - 107***				
2,4,6-Tribromophenol	***82***	***39 - 116***				
Terphenyl-d14	***81***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-2R-2019**					
Laboratory ID:	07-225-07					
Naphthalene	**ND**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
2-Methylnaphthalene	**ND**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
1-Methylnaphthalene	**ND**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Dimethylphthalate	**ND**	0.19	EPA 8270D	7-24-19	7-29-19	
Acenaphthylene	**ND**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Acenaphthene	**ND**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Diethylphthalate	**ND**	0.19	EPA 8270D	7-24-19	7-29-19	
Fluorene	**ND**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Phenanthrene	**0.085**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Anthracene	**0.015**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Di-n-butylphthalate	**ND**	0.19	EPA 8270D	7-24-19	7-29-19	
Fluoranthene	**0.16**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Pyrene	**0.12**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Butylbenzylphthalate	**ND**	0.19	EPA 8270D	7-24-19	7-29-19	
Benzo[a]anthracene	**0.072**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Chrysene	**0.078**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
bis(2-Ethylhexyl)phthalate	**0.20**	0.19	EPA 8270D	7-24-19	7-29-19	
Di-n-octylphthalate	**ND**	0.19	EPA 8270D	7-24-19	7-29-19	
Benzo[b]fluoranthene	**0.11**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo(j,k)fluoranthene	**0.036**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo[a]pyrene	**0.077**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Indeno[1,2,3-cd]pyrene	**0.056**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Dibenz[a,h]anthracene	**0.0098**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo[g,h,i]perylene	**0.055**	0.0075	EPA 8270D/SIM	7-24-19	7-29-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***54***	***21 - 107***				
Phenol-d6	***71***	***30 - 106***				
Nitrobenzene-d5	***59***	***28 - 109***				
2-Fluorobiphenyl	***75***	***37 - 107***				
2,4,6-Tribromophenol	***85***	***39 - 116***				
Terphenyl-d14	***80***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-1R-2019**					
Laboratory ID:	07-225-09					
Naphthalene	**ND**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
2-Methylnaphthalene	**ND**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
1-Methylnaphthalene	**ND**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Dimethylphthalate	**ND**	0.18	EPA 8270D	7-24-19	7-29-19	
Acenaphthylene	**ND**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Acenaphthene	**ND**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Diethylphthalate	**ND**	0.18	EPA 8270D	7-24-19	7-29-19	
Fluorene	**ND**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Phenanthrene	**0.058**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Anthracene	**0.0076**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Di-n-butylphthalate	**ND**	0.18	EPA 8270D	7-24-19	7-29-19	
Fluoranthene	**0.11**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Pyrene	**0.091**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Butylbenzylphthalate	**ND**	0.18	EPA 8270D	7-24-19	7-29-19	
Benzo[a]anthracene	**0.048**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Chrysene	**0.055**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
bis(2-Ethylhexyl)phthalate	**0.20**	0.18	EPA 8270D	7-24-19	7-29-19	
Di-n-octylphthalate	**ND**	0.18	EPA 8270D	7-24-19	7-29-19	
Benzo[b]fluoranthene	**0.078**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo(j,k)fluoranthene	**0.029**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo[a]pyrene	**0.057**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Indeno[1,2,3-cd]pyrene	**0.049**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Dibenz[a,h]anthracene	**ND**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Benzo[g,h,i]perylene	**0.048**	0.0073	EPA 8270D/SIM	7-24-19	7-29-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***70***	***21 - 107***				
Phenol-d6	***82***	***30 - 106***				
Nitrobenzene-d5	***71***	***28 - 109***				
2-Fluorobiphenyl	***84***	***37 - 107***				
2,4,6-Tribromophenol	***93***	***39 - 116***				
Terphenyl-d14	***88***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0724S2					
Naphthalene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Dimethylphthalate	**ND**	0.020	EPA 8270D	7-24-19	7-25-19	
Acenaphthylene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Acenaphthene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Diethylphthalate	**ND**	0.020	EPA 8270D	7-24-19	7-25-19	
Fluorene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Phenanthrene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Anthracene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Di-n-butylphthalate	**ND**	0.020	EPA 8270D	7-24-19	7-25-19	
Fluoranthene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Pyrene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Butylbenzylphthalate	**ND**	0.020	EPA 8270D	7-24-19	7-25-19	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Chrysene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270D	7-24-19	7-25-19	
Di-n-octylphthalate	**ND**	0.020	EPA 8270D	7-24-19	7-25-19	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270D/SIM	7-24-19	7-24-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***55***	***21 - 107***				
Phenol-d6	***59***	***30 - 106***				
Nitrobenzene-d5	***64***	***28 - 109***				
2-Fluorobiphenyl	***70***	***37 - 107***				
2,4,6-Tribromophenol	***77***	***39 - 116***				
Terphenyl-d14	***81***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0724S2									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.663**	**0.588**	0.800	0.800	83	74	44 - 106	12	26	
2-Chlorophenol	**0.658**	**0.581**	0.800	0.800	82	73	45 - 108	12	28	
1,4-Dichlorobenzene	**0.317**	**0.275**	0.400	0.400	79	69	40 - 109	14	31	
n-Nitroso-di-n-propylamine	**0.311**	**0.276**	0.400	0.400	78	69	47 - 108	12	24	
1,2,4-Trichlorobenzene	**0.329**	**0.291**	0.400	0.400	82	73	47 - 111	12	28	
4-Chloro-3-methylphenol	**0.701**	**0.646**	0.800	0.800	88	81	58 - 109	8	19	
Acenaphthene	**0.334**	**0.300**	0.400	0.400	84	75	54 - 105	11	19	
4-Nitrophenol	**0.740**	**0.699**	0.800	0.800	93	87	50 - 118	6	18	
2,4-Dinitrotoluene	**0.341**	**0.324**	0.400	0.400	85	81	49 - 109	5	20	
Pentachlorophenol	**0.728**	**0.680**	0.800	0.800	91	85	42 - 142	7	23	
Pyrene	**0.353**	**0.332**	0.400	0.400	88	83	57 - 110	6	16	
Surrogate:										
2-Fluorophenol					***72***	***62***	***21 - 107***			
Phenol-d6					***74***	***65***	***30 - 106***			
Nitrobenzene-d5					***79***	***70***	***28 - 109***			
2-Fluorobiphenyl					***81***	***73***	***37 - 107***			
2,4,6-Tribromophenol					***88***	***82***	***39 - 116***			
Terphenyl-d14					***92***	***85***	***41 - 113***			

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-SR-2019**					
Laboratory ID:	07-225-03					
Total Solids	**24**	0.50	SM 2540G	7-31-19	8-1-19	
Client ID:	**MONT-SM-2019**					
Laboratory ID:	07-225-04					
Total Solids	**14**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**TOSH-2R-2019**					
Laboratory ID:	07-225-07					
Total Solids	**53**	0.50	SM 2540G	7-31-19	8-1-19	
Client ID:	**TOSH-2M-2019**					
Laboratory ID:	07-225-08					
Total Solids	**48**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**TOSH-1R-2019**					
Laboratory ID:	07-225-09					
Total Solids	**55**	0.50	SM 2540G	7-31-19	8-1-19	
Client ID:	**TOSH-1M-2019**					
Laboratory ID:	07-225-10					
Total Solids	**50**	0.50	SM 2540G	9-6-19	9-7-19	

Date of Report: September 12, 2019
Samples Submitted: July 19, 2019
Laboratory Reference: 1907-225
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G
QUALITY CONTROL

Matrix: Sediment
Units: % Solids

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-225-07								
	ORIG	DUP							
Total Solids	**53.0**	**53.2**	NA	NA	NA	NA	0	20	
Laboratory ID:	08-092-12								
	ORIG	DUP							
Total Solids	**12.8**	**14.0**	NA	NA	NA	NA	9	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Laboratory No. 07-225

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: John Lenth

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates					Hold		Total Solids 2540G
1	Colm-1R-2019	7/2/19	1035	Sediment	1	X			X	X					X		X
2	Colm-1M-2019	7/2/19	1035	Sediment	1		X	X							X		
3	MONT-SR-2019	7.11.19	1220	Sediment	1	X			X	X							
4	MONT-SM-2019	7.11.19	1220	Sediment	1		X	X									
5	SIDL-1R-2019	7.17.19	1200	Sediment	1	X			X	X							
6	SIDL-1M-2019	7.17.19	1200	Sediment	1		X	X									
7	TOSH-2R-2019	7.12.19	10:30	Sediment	1	X			X	X							
8	TOSH-2M-2019	7.12.19	10:30	Sediment	1		X	X									
9	TOSH-1R-2019	7.19.19	10:30	Sediment	1	X			X	X							
10	TOSH-1M-2019	7.19.19	10:30	Sediment	1		X	X									
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by: [signature] Date 7.19.19 Received by: [signature] Date 7/19/19
Firm HEC Time 1545 Firm OSE Time 1545
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 12, 2019

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1907-316

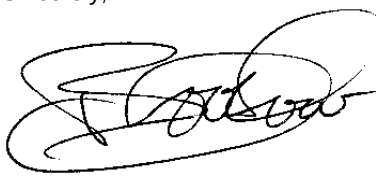
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 26, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

Case Narrative

Samples were collected on July 23 and 26, 2019 and received by the laboratory on July 26, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 6010D Analysis

The liquid portion of the sample was decanted and only the solid portion was analyzed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLIN-1R-2019**					
Laboratory ID:	07-316-02					
Total Organic Carbon	**3.6**	0.39	EPA 9060A	8-14-19	8-14-19	
Client ID:	**MONT-2R-2019**					
Laboratory ID:	07-316-04					
Total Organic Carbon	**3.0**	0.19	EPA 9060A	8-14-19	8-14-19	
Client ID:	**MONT-3R-2019**					
Laboratory ID:	07-316-06					
Total Organic Carbon	**13**	0.84	EPA 9060A	8-16-19	8-16-19	

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Solid
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0814S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-14-19	8-14-19	
Laboratory ID:	MB0816S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-16-19	8-16-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-316-04								
	ORIG	DUP							
Total Organic Carbon	**3.04**	**2.81**	NA	NA	NA	NA	8	20	
Laboratory ID:	08-092-16								
	ORIG	DUP							
Total Organic Carbon	**4.01**	**4.09**	NA	NA	NA	NA	2	20	
SPIKE BLANK									
Laboratory ID:	SB0814S1								
	SB		SB		SB				
Total Organic Carbon	**46.0**		42.1	NA	109	90-121	NA	NA	
Laboratory ID:	SB0816S1								
	SB		SB		SB				
Total Organic Carbon	**41.2**		42.1	NA	98	90-121	NA	NA	

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

TOTAL METALS
EPA 6010D

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLIN-1M-2019**					
Laboratory ID:	07-316-01					
Copper	**16**	4.8	EPA 6010D	9-11-19	9-11-19	
Zinc	**81**	12	EPA 6010D	9-11-19	9-11-19	
Client ID:	**MONT-2M-2019**					
Laboratory ID:	07-316-03					
Copper	**30**	5.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**560**	13	EPA 6010D	9-11-19	9-11-19	
Client ID:	**MONT-3M-2019**					
Laboratory ID:	07-316-05					
Copper	**55**	4.5	EPA 6010D	9-11-19	9-11-19	
Zinc	**880**	11	EPA 6010D	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911SM4					
Copper	**ND**	1.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**ND**	2.5	EPA 6010D	9-11-19	9-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-225-04										
	ORIG	DUP									
Copper	**4.85**	**4.28**	NA	NA		NA		NA	13	20	
Zinc	**30.7**	**29.5**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	07-225-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**52.8**	**53.6**	50.0	50.0	4.85	**96**	**97**	75-125	2	20	
Zinc	**118**	**120**	100	100	30.7	**87**	**90**	75-125	2	20	

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLIN-1R-2019**					
Laboratory ID:	07-316-02					
Naphthalene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
2-Methylnaphthalene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
1-Methylnaphthalene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Dimethylphthalate	**ND**	0.10	EPA 8270D	8-6-19	8-12-19	
Acenaphthylene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Acenaphthene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Diethylphthalate	**ND**	0.10	EPA 8270D	8-6-19	8-12-19	
Fluorene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Phenanthrene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Anthracene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Di-n-butylphthalate	**ND**	0.10	EPA 8270D	8-6-19	8-12-19	
Fluoranthene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Pyrene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Butylbenzylphthalate	**ND**	0.10	EPA 8270D	8-6-19	8-12-19	
Benzo[a]anthracene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Chrysene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270D	8-6-19	8-12-19	
Di-n-octylphthalate	**ND**	0.10	EPA 8270D	8-6-19	8-12-19	
Benzo[b]fluoranthene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo(j,k)fluoranthene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[a]pyrene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Dibenz[a,h]anthracene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[g,h,i]perylene	**ND**	0.021	EPA 8270D/SIM	8-6-19	8-8-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***59***	***21 - 107***				
Phenol-d6	***70***	***30 - 106***				
Nitrobenzene-d5	***71***	***28 - 109***				
2-Fluorobiphenyl	***73***	***37 - 107***				
2,4,6-Tribromophenol	***91***	***39 - 116***				
Terphenyl-d14	***87***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-2R-2019**					
Laboratory ID:	07-316-04					
Naphthalene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
2-Methylnaphthalene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
1-Methylnaphthalene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Dimethylphthalate	**ND**	0.038	EPA 8270D	8-6-19	8-12-19	
Acenaphthylene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Acenaphthene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Diethylphthalate	**ND**	0.038	EPA 8270D	8-6-19	8-12-19	
Fluorene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Phenanthrene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Anthracene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Di-n-butylphthalate	**ND**	0.038	EPA 8270D	8-6-19	8-12-19	
Fluoranthene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Pyrene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Butylbenzylphthalate	**ND**	0.038	EPA 8270D	8-6-19	8-12-19	
Benzo[a]anthracene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Chrysene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
bis(2-Ethylhexyl)phthalate	**0.048**	0.038	EPA 8270D	8-6-19	8-12-19	
Di-n-octylphthalate	**ND**	0.038	EPA 8270D	8-6-19	8-12-19	
Benzo[b]fluoranthene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo(j,k)fluoranthene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[a]pyrene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Dibenz[a,h]anthracene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[g,h,i]perylene	**ND**	0.0075	EPA 8270D/SIM	8-6-19	8-8-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***30***	***21 - 107***				
Phenol-d6	***49***	***30 - 106***				
Nitrobenzene-d5	***41***	***28 - 109***				
2-Fluorobiphenyl	***60***	***37 - 107***				
2,4,6-Tribromophenol	***85***	***39 - 116***				
Terphenyl-d14	***80***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-3R-2019**					
Laboratory ID:	07-316-06					
Naphthalene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
2-Methylnaphthalene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
1-Methylnaphthalene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Dimethylphthalate	**ND**	0.25	EPA 8270D	8-6-19	8-12-19	
Acenaphthylene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Acenaphthene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Diethylphthalate	**ND**	0.25	EPA 8270D	8-6-19	8-12-19	
Fluorene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Phenanthrene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Anthracene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Di-n-butylphthalate	**ND**	0.25	EPA 8270D	8-6-19	8-12-19	
Fluoranthene	**0.054**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Pyrene	**0.057**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Butylbenzylphthalate	**ND**	0.25	EPA 8270D	8-6-19	8-12-19	
Benzo[a]anthracene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Chrysene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
bis(2-Ethylhexyl)phthalate	**0.99**	0.25	EPA 8270D	8-6-19	8-12-19	
Di-n-octylphthalate	**ND**	0.25	EPA 8270D	8-6-19	8-12-19	
Benzo[b]fluoranthene	**0.054**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo(j,k)fluoranthene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[a]pyrene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Dibenz[a,h]anthracene	**ND**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[g,h,i]perylene	**0.072**	0.051	EPA 8270D/SIM	8-6-19	8-8-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***50***	***21 - 107***				
Phenol-d6	***62***	***30 - 106***				
Nitrobenzene-d5	***62***	***28 - 109***				
2-Fluorobiphenyl	***67***	***37 - 107***				
2,4,6-Tribromophenol	***84***	***39 - 116***				
Terphenyl-d14	***78***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0806S1					
Naphthalene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Dimethylphthalate	**ND**	0.020	EPA 8270D	8-6-19	8-12-19	
Acenaphthylene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Acenaphthene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Diethylphthalate	**ND**	0.020	EPA 8270D	8-6-19	8-12-19	
Fluorene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Phenanthrene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Anthracene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Di-n-butylphthalate	**ND**	0.020	EPA 8270D	8-6-19	8-12-19	
Fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Pyrene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Butylbenzylphthalate	**ND**	0.020	EPA 8270D	8-6-19	8-12-19	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Chrysene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270D	8-6-19	8-12-19	
Di-n-octylphthalate	**ND**	0.020	EPA 8270D	8-6-19	8-12-19	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270D/SIM	8-6-19	8-8-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***61***	***21 - 107***				
Phenol-d6	***68***	***30 - 106***				
Nitrobenzene-d5	***69***	***28 - 109***				
2-Fluorobiphenyl	***68***	***37 - 107***				
2,4,6-Tribromophenol	***81***	***39 - 116***				
Terphenyl-d14	***91***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0806S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.622**	**0.540**	0.800	0.800	78	68	44 - 106	14	26	
2-Chlorophenol	**0.607**	**0.530**	0.800	0.800	76	66	45 - 108	14	28	
1,4-Dichlorobenzene	**0.289**	**0.250**	0.400	0.400	72	63	40 - 109	14	31	
n-Nitroso-di-n-propylamine	**0.283**	**0.253**	0.400	0.400	71	63	47 - 108	11	24	
1,2,4-Trichlorobenzene	**0.301**	**0.266**	0.400	0.400	75	67	47 - 111	12	28	
4-Chloro-3-methylphenol	**0.642**	**0.597**	0.800	0.800	80	75	58 - 109	7	19	
Acenaphthene	**0.302**	**0.274**	0.400	0.400	76	69	54 - 105	10	19	
4-Nitrophenol	**0.658**	**0.591**	0.800	0.800	82	74	50 - 118	11	18	
2,4-Dinitrotoluene	**0.350**	**0.312**	0.400	0.400	88	78	49 - 109	11	20	
Pentachlorophenol	**0.704**	**0.592**	0.800	0.800	88	74	42 - 142	17	23	
Pyrene	**0.360**	**0.324**	0.400	0.400	90	81	57 - 110	11	16	
Surrogate:										
2-Fluorophenol					***75***	***64***	***21 - 107***			
Phenol-d6					***79***	***69***	***30 - 106***			
Nitrobenzene-d5					***81***	***72***	***28 - 109***			
2-Fluorobiphenyl					***76***	***70***	***37 - 107***			
2,4,6-Tribromophenol					***89***	***79***	***39 - 116***			
Terphenyl-d14					***95***	***85***	***41 - 113***			

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLIN-1M-2019**					
Laboratory ID:	07-316-01					
Total Solids	**21**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**COLIN-1R-2019**					
Laboratory ID:	07-316-02					
Total Solids	**38**	0.50	SM 2540G	8-7-19	8-8-19	
Client ID:	**MONT-2M-2019**					
Laboratory ID:	07-316-03					
Total Solids	**20**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**MONT-2R-2019**					
Laboratory ID:	07-316-04					
Total Solids	**53**	0.50	SM 2540G	8-7-19	8-8-19	
Client ID:	**MONT-3M-2019**					
Laboratory ID:	07-316-05					
Total Solids	**22**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**MONT-3R-2019**					
Laboratory ID:	07-316-06					
Total Solids	**16**	0.50	SM 2540G	8-7-19	8-8-19	

Date of Report: September 12, 2019
Samples Submitted: July 26, 2019
Laboratory Reference: 1907-316
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G
QUALITY CONTROL

Matrix: Sediment
Units: % Solids

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-316-04								
	ORIG	DUP							
Total Solids	**53.1**	**57.5**	NA	NA	NA	NA	8	20	
Laboratory ID:	08-092-12								
	ORIG	DUP							
Total Solids	**12.8**	**14.0**	NA	NA	NA	NA	9	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: John Lenth

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 07-316

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates							25406 Total Solids
1	COLIN-1M-2019	7.23.19	1030	Sediment	1		X	X									X
2	COLIN-1R-2019	7.23.19	1030	Sediment	1	X			X	X							X
3	~~MONT-3M~~-2019	7.23.19	1245	Sediment	1												
4	~~MONT-3R~~-2019	7.23.19	1245	Sediment	1												
83	MONT-2M-2019	7.24.19	1215	Sediment	1		X	X									X
84	MONT-2R-2019	7.24.19	1215	Sediment	1	X			X	X							X
85	MONT-3M-2019	7.23.19	1245	Sediment	1		X	X									X
67	MONT-3R-2019	7.23.19	1245	Sediment	1	X			X	X							X
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by Miami HEC Date 7.24.19 Received by _____ Date 7/26/19
Firm HEC Time 1615 Firm _____ Time 1645
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 12, 2019

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1908-092

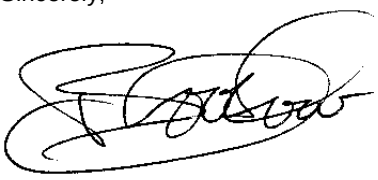
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 7, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

Case Narrative

Samples were collected on July 25, 30, 31, and August 6, 2019 and received by the laboratory on August 7, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 6010D Analysis

The liquid portion of the sample was decanted and only the solid portion was analyzed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY2 R-2019**					
Laboratory ID:	08-092-03					
Total Organic Carbon	**7.1**	0.70	EPA 9060A	8-20-19	8-20-19	
Client ID:	**EVALSS R-2019**					
Laboratory ID:	08-092-05					
Total Organic Carbon	**6.1**	0.51	EPA 9060A	8-20-19	8-20-19	
Client ID:	**SIDL-3 R-2019**					
Laboratory ID:	08-092-09					
Total Organic Carbon	**11**	0.62	EPA 9060A	8-20-19	8-20-19	
Client ID:	**SIDL-1 R-2019**					
Laboratory ID:	08-092-11					
Total Organic Carbon	**7.2**	0.58	EPA 9060A	8-16-19	8-16-19	
Client ID:	**SIDL-2 R-2019**					
Laboratory ID:	08-092-16					
Total Organic Carbon	**4.0**	0.15	EPA 9060A	8-16-19	8-16-19	

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Solid
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0816S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-16-19	8-16-19	
Laboratory ID:	MB0820S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-20-19	8-20-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-092-16								
	ORIG	DUP							
Total Organic Carbon	**4.01**	**4.09**	NA	NA	NA	NA	2	20	
Laboratory ID:	08-092-05								
	ORIG	DUP							
Total Organic Carbon	**6.12**	**6.89**	NA	NA	NA	NA	12	20	
SPIKE BLANK									
Laboratory ID:	SB0816S1								
	SB		SB		SB				
Total Organic Carbon	**41.2**		42.1	NA	98	90-121	NA	NA	
Laboratory ID:	SB0820S1								
	SB		SB		SB				
Total Organic Carbon	**40.9**		42.1	NA	97	90-121	NA	NA	

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

TOTAL METALS
EPA 6010D

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY2 M-2019**					
Laboratory ID:	08-092-04					
Copper	**20**	2.4	EPA 6010D	9-11-19	9-11-19	
Zinc	**80**	6.0	EPA 6010D	9-11-19	9-11-19	
Client ID:	**EVALSS M-2019**					
Laboratory ID:	08-092-06					
Copper	**26**	4.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**75**	10	EPA 6010D	9-11-19	9-11-19	
Client ID:	**SIDL-3 M-2019**					
Laboratory ID:	08-092-10					
Copper	**18**	5.9	EPA 6010D	9-11-19	9-11-19	
Zinc	**80**	15	EPA 6010D	9-11-19	9-11-19	
Client ID:	**SIDL-1 M-2019**					
Laboratory ID:	08-092-12					
Copper	**17**	7.7	EPA 6010D	9-11-19	9-11-19	
Zinc	**71**	19	EPA 6010D	9-11-19	9-11-19	
Client ID:	**SIDL-2 M-2019**					
Laboratory ID:	08-092-15					
Copper	**24**	3.1	EPA 6010D	9-11-19	9-11-19	
Zinc	**52**	7.8	EPA 6010D	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911SM4					
Copper	**ND**	1.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**ND**	2.5	EPA 6010D	9-11-19	9-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-225-04										
	ORIG	DUP									
Copper	**4.85**	**4.28**	NA	NA		NA		NA	13	20	
Zinc	**30.7**	**29.5**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	07-225-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**52.8**	**53.6**	50.0	50.0	4.85	**96**	**97**	75-125	2	20	
Zinc	**118**	**120**	100	100	30.7	**87**	**90**	75-125	2	20	

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY2 R-2019**					
Laboratory ID:	08-092-03					
Naphthalene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
2-Methylnaphthalene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
1-Methylnaphthalene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Dimethylphthalate	**ND**	0.058	EPA 8270D	8-8-19	8-12-19	
Acenaphthylene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Acenaphthene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Diethylphthalate	**ND**	0.058	EPA 8270D	8-8-19	8-12-19	
Fluorene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Phenanthrene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Anthracene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Di-n-butylphthalate	**ND**	0.058	EPA 8270D	8-8-19	8-12-19	
Fluoranthene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Pyrene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Butylbenzylphthalate	**ND**	0.15	EPA 8270D	8-8-19	8-12-19	U1
Benzo[a]anthracene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Chrysene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
bis(2-Ethylhexyl)phthalate	**0.076**	0.058	EPA 8270D	8-8-19	8-12-19	
Di-n-octylphthalate	**ND**	0.058	EPA 8270D	8-8-19	8-12-19	
Benzo[b]fluoranthene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo(j,k)fluoranthene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[a]pyrene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Dibenz[a,h]anthracene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[g,h,i]perylene	**ND**	0.012	EPA 8270D/SIM	8-8-19	8-12-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***55***	***21 - 107***				
Phenol-d6	***67***	***30 - 106***				
Nitrobenzene-d5	***66***	***28 - 109***				
2-Fluorobiphenyl	***65***	***37 - 107***				
2,4,6-Tribromophenol	***87***	***39 - 116***				
Terphenyl-d14	***73***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVALSS R-2019**					
Laboratory ID:	08-092-05					
Naphthalene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
2-Methylnaphthalene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
1-Methylnaphthalene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Dimethylphthalate	**ND**	0.031	EPA 8270D	8-8-19	8-12-19	
Acenaphthylene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Acenaphthene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Diethylphthalate	**ND**	0.031	EPA 8270D	8-8-19	8-12-19	
Fluorene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Phenanthrene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Anthracene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Di-n-butylphthalate	**ND**	0.031	EPA 8270D	8-8-19	8-12-19	
Fluoranthene	**0.034**	0.031	EPA 8270D	8-8-19	8-12-19	
Pyrene	**0.055**	0.031	EPA 8270D	8-8-19	8-12-19	
Butylbenzylphthalate	**ND**	0.031	EPA 8270D	8-8-19	8-12-19	
Benzo[a]anthracene	**0.042**	0.031	EPA 8270D	8-8-19	8-12-19	
Chrysene	**0.053**	0.031	EPA 8270D	8-8-19	8-12-19	
bis(2-Ethylhexyl)phthalate	**0.056**	0.031	EPA 8270D	8-8-19	8-12-19	
Di-n-octylphthalate	**ND**	0.031	EPA 8270D	8-8-19	8-12-19	
Benzo[b]fluoranthene	**0.071**	0.031	EPA 8270D	8-8-19	8-12-19	
Benzo(j,k)fluoranthene	**0.020**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[a]pyrene	**0.046**	0.031	EPA 8270D	8-8-19	8-12-19	
Indeno[1,2,3-cd]pyrene	**0.024**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Dibenz[a,h]anthracene	**ND**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[g,h,i]perylene	**0.020**	0.0063	EPA 8270D/SIM	8-8-19	8-12-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***52***	***21 - 107***				
Phenol-d6	***67***	***30 - 106***				
Nitrobenzene-d5	***64***	***28 - 109***				
2-Fluorobiphenyl	***69***	***37 - 107***				
2,4,6-Tribromophenol	***86***	***39 - 116***				
Terphenyl-d14	***76***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-3 R-2019**					
Laboratory ID:	08-092-09					
Naphthalene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
2-Methylnaphthalene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
1-Methylnaphthalene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Dimethylphthalate	**ND**	0.086	EPA 8270D	8-8-19	8-12-19	
Acenaphthylene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Acenaphthene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Diethylphthalate	**ND**	0.086	EPA 8270D	8-8-19	8-12-19	
Fluorene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Phenanthrene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Anthracene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Di-n-butylphthalate	**ND**	0.086	EPA 8270D	8-8-19	8-12-19	
Fluoranthene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Pyrene	**0.026**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Butylbenzylphthalate	**ND**	0.086	EPA 8270D	8-8-19	8-12-19	
Benzo[a]anthracene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Chrysene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
bis(2-Ethylhexyl)phthalate	**0.099**	0.086	EPA 8270D	8-8-19	8-12-19	
Di-n-octylphthalate	**ND**	0.086	EPA 8270D	8-8-19	8-12-19	
Benzo[b]fluoranthene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo(j,k)fluoranthene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[a]pyrene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Dibenz[a,h]anthracene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[g,h,i]perylene	**ND**	0.017	EPA 8270D/SIM	8-8-19	8-12-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***44***	***21 - 107***				
Phenol-d6	***58***	***30 - 106***				
Nitrobenzene-d5	***51***	***28 - 109***				
2-Fluorobiphenyl	***58***	***37 - 107***				
2,4,6-Tribromophenol	***85***	***39 - 116***				
Terphenyl-d14	***73***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-1 R-2019**					
Laboratory ID:	08-092-11					
Naphthalene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
2-Methylnaphthalene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
1-Methylnaphthalene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Dimethylphthalate	**ND**	0.19	EPA 8270D	8-8-19	8-12-19	
Acenaphthylene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Acenaphthene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Diethylphthalate	**ND**	0.19	EPA 8270D	8-8-19	8-12-19	
Fluorene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Phenanthrene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Anthracene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Di-n-butylphthalate	**ND**	0.19	EPA 8270D	8-8-19	8-12-19	
Fluoranthene	**0.048**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Pyrene	**0.071**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Butylbenzylphthalate	**ND**	0.19	EPA 8270D	8-8-19	8-12-19	
Benzo[a]anthracene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Chrysene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
bis(2-Ethylhexyl)phthalate	**0.26**	0.19	EPA 8270D	8-8-19	8-12-19	
Di-n-octylphthalate	**ND**	0.19	EPA 8270D	8-8-19	8-12-19	
Benzo[b]fluoranthene	**0.050**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo(j,k)fluoranthene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[a]pyrene	**0.047**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Dibenz[a,h]anthracene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[g,h,i]perylene	**ND**	0.038	EPA 8270D/SIM	8-8-19	8-12-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***57***	***21 - 107***				
Phenol-d6	***68***	***30 - 106***				
Nitrobenzene-d5	***60***	***28 - 109***				
2-Fluorobiphenyl	***58***	***37 - 107***				
2,4,6-Tribromophenol	***89***	***39 - 116***				
Terphenyl-d14	***76***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-2 R-2019**					
Laboratory ID:	08-092-16					
Naphthalene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
2-Methylnaphthalene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
1-Methylnaphthalene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Dimethylphthalate	**ND**	0.045	EPA 8270D	8-8-19	8-12-19	
Acenaphthylene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Acenaphthene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Diethylphthalate	**ND**	0.045	EPA 8270D	8-8-19	8-12-19	
Fluorene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Phenanthrene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Anthracene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Di-n-butylphthalate	**ND**	0.045	EPA 8270D	8-8-19	8-12-19	
Fluoranthene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Pyrene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Butylbenzylphthalate	**ND**	0.045	EPA 8270D	8-8-19	8-12-19	
Benzo[a]anthracene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Chrysene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.045	EPA 8270D	8-8-19	8-12-19	
Di-n-octylphthalate	**ND**	0.045	EPA 8270D	8-8-19	8-12-19	
Benzo[b]fluoranthene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo(j,k)fluoranthene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[a]pyrene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Dibenz[a,h]anthracene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Benzo[g,h,i]perylene	**ND**	0.0090	EPA 8270D/SIM	8-8-19	8-12-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***51***	***21 - 107***				
Phenol-d6	***64***	***30 - 106***				
Nitrobenzene-d5	***61***	***28 - 109***				
2-Fluorobiphenyl	***67***	***37 - 107***				
2,4,6-Tribromophenol	***87***	***39 - 116***				
Terphenyl-d14	***78***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0808S1					
Naphthalene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Dimethylphthalate	**ND**	0.020	EPA 8270D	8-8-19	8-9-19	
Acenaphthylene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Acenaphthene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Diethylphthalate	**ND**	0.020	EPA 8270D	8-8-19	8-9-19	
Fluorene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Phenanthrene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Anthracene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Di-n-butylphthalate	**ND**	0.020	EPA 8270D	8-8-19	8-9-19	
Fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Pyrene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Butylbenzylphthalate	**ND**	0.020	EPA 8270D	8-8-19	8-9-19	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Chrysene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270D	8-8-19	8-9-19	
Di-n-octylphthalate	**ND**	0.020	EPA 8270D	8-8-19	8-9-19	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270D/SIM	8-8-19	8-9-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***69***	***21 - 107***				
Phenol-d6	***76***	***30 - 106***				
Nitrobenzene-d5	***78***	***28 - 109***				
2-Fluorobiphenyl	***78***	***37 - 107***				
2,4,6-Tribromophenol	***96***	***39 - 116***				
Terphenyl-d14	***98***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0808S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**1.10**	**0.897**	1.33	1.33	83	67	44 - 106	20	26	
2-Chlorophenol	**1.05**	**0.843**	1.33	1.33	79	63	45 - 108	22	28	
1,4-Dichlorobenzene	**0.479**	**0.387**	0.667	0.667	72	58	40 - 109	21	31	
n-Nitroso-di-n-propylamine	**0.536**	**0.433**	0.667	0.667	80	65	47 - 108	21	24	
1,2,4-Trichlorobenzene	**0.518**	**0.422**	0.667	0.667	78	63	47 - 111	20	28	
4-Chloro-3-methylphenol	**1.26**	**1.09**	1.33	1.33	95	82	58 - 109	14	19	
Acenaphthene	**0.578**	**0.493**	0.667	0.667	87	74	54 - 105	16	19	
4-Nitrophenol	**1.21**	**1.12**	1.33	1.33	91	84	50 - 118	8	18	
2,4-Dinitrotoluene	**0.633**	**0.568**	0.667	0.667	95	85	49 - 109	11	20	
Pentachlorophenol	**1.29**	**1.14**	1.33	1.33	97	86	42 - 142	12	23	
Pyrene	**0.662**	**0.590**	0.667	0.667	99	88	57 - 110	12	16	
Surrogate:										
2-Fluorophenol					***75***	***60***	***21 - 107***			
Phenol-d6					***84***	***68***	***30 - 106***			
Nitrobenzene-d5					***83***	***68***	***28 - 109***			
2-Fluorobiphenyl					***85***	***72***	***37 - 107***			
2,4,6-Tribromophenol					***103***	***91***	***39 - 116***			
Terphenyl-d14					***103***	***92***	***41 - 113***			

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY2 R-2019**					
Laboratory ID:	08-092-03					
Total Solids	**34**	0.50	SM 2540G	8-13-19	8-14-19	
Client ID:	**CTRY2 M-2019**					
Laboratory ID:	08-092-04					
Total Solids	**42**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**EVALSS R-2019**					
Laboratory ID:	08-092-05					
Total Solids	**63**	0.50	SM 2540G	8-13-19	8-14-19	
Client ID:	**EVALSS M-2019**					
Laboratory ID:	08-092-06					
Total Solids	**25**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**SIDL-3 R-2019**					
Laboratory ID:	08-092-09					
Total Solids	**23**	0.50	SM 2540G	8-8-19	8-9-19	
Client ID:	**SIDL-3 M-2019**					
Laboratory ID:	08-092-10					
Total Solids	**17**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**SIDL-1 R-2019**					
Laboratory ID:	08-092-11					
Total Solids	**11**	0.50	SM 2540G	8-13-19	8-14-19	

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-1 M-2019**					
Laboratory ID:	08-092-12					
Total Solids	**13**	0.50	SM 2540G	9-6-19	9-7-19	
Client ID:	**SIDL-2 M-2019**					
Laboratory ID:	08-092-15					
Total Solids	**32**	0.50	SM 2540G	9-10-19	9-11-19	
Client ID:	**SIDL-2 R-2019**					
Laboratory ID:	08-092-16					
Total Solids	**45**	0.50	SM 2540G	9-10-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: August 7, 2019
Laboratory Reference: 1908-092
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G
QUALITY CONTROL

Matrix: Sediment
Units: % Solids

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-092-05								
	ORIG	DUP							
Total Solids	**63.5**	**67.1**	NA	NA	NA	NA	6	20	
Laboratory ID:	08-092-12								
	ORIG	DUP							
Total Solids	**13.2**	**14.2**	NA	NA	NA	NA	7	20	
Laboratory ID:	08-304-01								
	ORIG	DUP							
Total Solids	**23.2**	**23.0**	NA	NA	NA	NA	1	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

Laboratory No. 08-092

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: John Lenth

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates							Total Solids
1	CTRY1-R-2019	7.31.19	1430	Sediment	1	X			X	X							X
2	CTRY1-M-2019	7.31.19	1430	Sediment	1		X	X									
3	CTRY2 R-2019	8.6.19	1300	Sediment	1	X			X	X							
4	CTRY2 M-2019	8.6.19	1300	Sediment	1		X	X									
5	EVALSS R-2019	7.31.19	1705	Sediment	1	X			X	X							
6	EVALSS M-2019	↓	↓	Sediment	1		X	X									
7	EVAMSS R-2019	8.2.19	1330	Sediment	1	X			X	X							
8	EVAMSS M-2019	↓	↓	Sediment	1		X	X									
9	SIDL3 R-2019	7.30.19	1230	Sediment	1	X			X	X							
10	SIDL-3 M-2019	↓	↓	Sediment	1		X	X									
11	SIDL-1 R-2019	7.25.19	1530	Sediment	1	X			X	X							
12	SIDL-1 M-2019	↓	↓	Sediment	1		X	X									
13	~~MONT-R-2019~~	8.7.19	1530	Sediment	1	X			X	X							
14	~~MONT-M-2019~~	↓	1530	Sediment	1		X	X									
15	SIDL2M-2019	7.25.19	1050	Sediment	1		X	X									
16	SIDL2R-2019	7.25.19	1030	Sediment	1	X			X	X							

Relinquished by Kyle Bliss Date 8.7.19 Received by [illegible] Date 8/7/19
Firm Herrera Time 16:00 Firm OSE Time 1600

Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 12, 2019

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1908-130

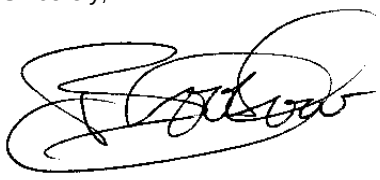
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 9, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

Case Narrative

Samples were collected on August 9, 2019 and received by the laboratory on August 9, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 6010D Analysis

The liquid portion of the sample was decanted and only the solid portion was analyzed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-4R-2019**					
Laboratory ID:	08-130-02					
Total Organic Carbon	**6.7**	0.23	EPA 9060A	8-20-19	8-20-19	

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Solid
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0820S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-20-19	8-20-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-092-05								
	ORIG	DUP							
Total Organic Carbon	**6.12**	**6.89**	NA	NA	NA	NA	12	20	
SPIKE BLANK									
Laboratory ID:	SB0820S1								
	SB		SB		SB				
Total Organic Carbon	**40.9**		42.1	NA	97	90-121	NA	NA	

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

TOTAL METALS
EPA 6010D

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-4M-2019**					
Laboratory ID:	08-130-01					
Copper	**58**	5.3	EPA 6010D	9-11-19	9-11-19	
Zinc	**360**	13	EPA 6010D	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911SM4					
Copper	**ND**	1.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**ND**	2.5	EPA 6010D	9-11-19	9-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-225-04										
	ORIG	DUP									
Copper	**4.85**	**4.28**	NA	NA		NA		NA	13	20	
Zinc	**30.7**	**29.5**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	07-225-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**52.8**	**53.6**	50.0	50.0	4.85	**96**	**97**	75-125	2	20	
Zinc	**118**	**120**	100	100	30.7	**87**	**90**	75-125	2	20	

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-4R-2019**					
Laboratory ID:	08-130-02					
Naphthalene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
2-Methylnaphthalene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
1-Methylnaphthalene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Dimethylphthalate	**ND**	0.092	EPA 8270D	8-15-19	8-19-19	
Acenaphthylene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Acenaphthene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Diethylphthalate	**ND**	0.092	EPA 8270D	8-15-19	8-19-19	
Fluorene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Phenanthrene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Anthracene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Di-n-butylphthalate	**ND**	0.092	EPA 8270D	8-15-19	8-19-19	
Fluoranthene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Pyrene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Butylbenzylphthalate	**ND**	0.092	EPA 8270D	8-15-19	8-19-19	
Benzo[a]anthracene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Chrysene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
bis(2-Ethylhexyl)phthalate	**0.15**	0.092	EPA 8270D	8-15-19	8-19-19	
Di-n-octylphthalate	**ND**	0.092	EPA 8270D	8-15-19	8-19-19	
Benzo[b]fluoranthene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo(j,k)fluoranthene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[a]pyrene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Dibenz[a,h]anthracene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[g,h,i]perylene	**ND**	0.018	EPA 8270D/SIM	8-15-19	8-16-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***50***	***21 - 107***				
Phenol-d6	***64***	***30 - 106***				
Nitrobenzene-d5	***59***	***28 - 109***				
2-Fluorobiphenyl	***63***	***37 - 107***				
2,4,6-Tribromophenol	***82***	***39 - 116***				
Terphenyl-d14	***76***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0815S1					
Naphthalene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Dimethylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Acenaphthylene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Acenaphthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Diethylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Fluorene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Phenanthrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Anthracene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Di-n-butylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Pyrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Butylbenzylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Chrysene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Di-n-octylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***62***	***21 - 107***				
Phenol-d6	***71***	***30 - 106***				
Nitrobenzene-d5	***65***	***28 - 109***				
2-Fluorobiphenyl	***74***	***37 - 107***				
2,4,6-Tribromophenol	***88***	***39 - 116***				
Terphenyl-d14	***108***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0815S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.572**	**0.617**	0.800	0.800	72	77	44 - 106	8	26	
2-Chlorophenol	**0.557**	**0.622**	0.800	0.800	70	78	45 - 108	11	28	
1,4-Dichlorobenzene	**0.263**	**0.303**	0.400	0.400	66	76	40 - 109	14	31	
n-Nitroso-di-n-propylamine	**0.357**	**0.370**	0.400	0.400	89	93	47 - 108	4	24	
1,2,4-Trichlorobenzene	**0.306**	**0.342**	0.400	0.400	77	86	47 - 111	11	28	
4-Chloro-3-methylphenol	**0.655**	**0.683**	0.800	0.800	82	85	58 - 109	4	19	
Acenaphthene	**0.326**	**0.320**	0.400	0.400	82	80	54 - 105	2	19	
4-Nitrophenol	**0.790**	**0.735**	0.800	0.800	99	92	50 - 118	7	18	
2,4-Dinitrotoluene	**0.317**	**0.313**	0.400	0.400	79	78	49 - 109	1	20	
Pentachlorophenol	**0.603**	**0.583**	0.800	0.800	75	73	42 - 142	3	23	
Pyrene	**0.335**	**0.334**	0.400	0.400	84	84	57 - 110	0	16	
Surrogate:										
2-Fluorophenol					***67***	***77***	***21 - 107***			
Phenol-d6					***74***	***80***	***30 - 106***			
Nitrobenzene-d5					***73***	***78***	***28 - 109***			
2-Fluorobiphenyl					***83***	***87***	***37 - 107***			
2,4,6-Tribromophenol					***89***	***89***	***39 - 116***			
Terphenyl-d14					***101***	***109***	***41 - 113***			

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-4M-2019**					
Laboratory ID:	08-130-01					
Total Solids	**19**	0.50	SM 2540G	9-10-19	9-11-19	
Client ID:	**MONT-4R-2019**					
Laboratory ID:	08-130-02					
Total Solids	**22**	0.50	SM 2540G	8-15-19	8-16-19	

Date of Report: September 12, 2019
Samples Submitted: August 9, 2019
Laboratory Reference: 1908-130
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G
QUALITY CONTROL

Matrix: Sediment
Units: % Solids

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-179-02								
	ORIG	DUP							
Total Solids	**48.9**	**52.0**	NA	NA	NA	NA	6	20	
Laboratory ID:	08-304-01								
	ORIG	DUP							
Total Solids	**23.2**	**23.0**	NA	NA	NA	NA	1	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Herrera
Project Number: 14-05804-000
Project Name: RPWS
Project Manager: John Lenth
Sampled by: Brianna Blaud, Nina Maas

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 08-130

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	~~Total RCRA Metals~~ Total Arsenic, Cadmium, Chromium, Lead, Mercury, Selenium, Silver	~~Total MTCA Metals~~ Copper	~~TCLP Metals~~ Zinc	~~HEM (oil and grease) 1664A~~ PAHs	Phthalates				% Moisture Total Solids 2540G
1	MONT-4M-2019	8.9.19	1110	Sediment	1															X	X						X
2	MONT-4R-2019	8.9.19	1110	Sediment	1														X			X	X				X

	Signature	Company	Date	Time
Relinquished	[signature]	HEC	8.9.19	1410
Received	[signature]	OSE	8/9/19	1410
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 12, 2019

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1908-179

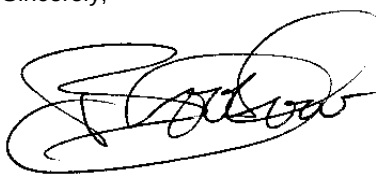
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 14, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

Case Narrative

Samples were collected on August 13 and 14, 2019 and received by the laboratory on August 14, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 6010D Analysis

The liquid portion of the sample was decanted and only the solid portion was analyzed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-3R-2019**					
Laboratory ID:	08-179-02					
Total Organic Carbon	**4.2**	0.21	EPA 9060A	9-9-19	9-9-19	
Client ID:	**TOSH-4R-2019**					
Laboratory ID:	08-179-04					
Total Organic Carbon	**1.2**	0.13	EPA 9060A	9-9-19	9-9-19	

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Solid
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0909S1					
Total Organic Carbon	**ND**	4.2	EPA 9060A	9-9-19	9-9-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-179-02								
	ORIG	DUP							
Total Organic Carbon	**4.17**	**4.38**	NA	NA	NA	NA	5	20	
SPIKE BLANK									
Laboratory ID:	SB0909S1								
	SB		SB		SB				
Total Organic Carbon	**41.4**		42.1	NA	98	90-121	NA	NA	

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

TOTAL METALS
EPA 6010D

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-3M-2019**					
Laboratory ID:	08-179-01					
Copper	**35**	2.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**490**	5.0	EPA 6010D	9-11-19	9-11-19	
Client ID:	**TOSH-4M-2019**					
Laboratory ID:	08-179-03					
Copper	**23**	1.8	EPA 6010D	9-11-19	9-11-19	
Zinc	**350**	4.5	EPA 6010D	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911SM4					
Copper	**ND**	1.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**ND**	2.5	EPA 6010D	9-11-19	9-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-225-04										
	ORIG	DUP									
Copper	**4.85**	**4.28**	NA	NA		NA		NA	13	20	
Zinc	**30.7**	**29.5**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	07-225-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**52.8**	**53.6**	50.0	50.0	4.85	**96**	**97**	75-125	2	20	
Zinc	**118**	**120**	100	100	30.7	**87**	**90**	75-125	2	20	

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-3R-2019**					
Laboratory ID:	08-179-02					
Naphthalene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
2-Methylnaphthalene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
1-Methylnaphthalene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Dimethylphthalate	**ND**	0.041	EPA 8270D	8-15-19	8-19-19	
Acenaphthylene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Acenaphthene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Diethylphthalate	**ND**	0.041	EPA 8270D	8-15-19	8-19-19	
Fluorene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Phenanthrene	**0.055**	0.041	EPA 8270D	8-15-19	8-19-19	
Anthracene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Di-n-butylphthalate	**ND**	0.041	EPA 8270D	8-15-19	8-19-19	
Fluoranthene	**0.11**	0.041	EPA 8270D	8-15-19	8-19-19	
Pyrene	**0.090**	0.041	EPA 8270D	8-15-19	8-19-19	
Butylbenzylphthalate	**0.049**	0.041	EPA 8270D	8-15-19	8-19-19	
Benzo[a]anthracene	**0.042**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Chrysene	**0.060**	0.041	EPA 8270D	8-15-19	8-19-19	
bis(2-Ethylhexyl)phthalate	**0.22**	0.041	EPA 8270D	8-15-19	8-19-19	
Di-n-octylphthalate	**ND**	0.041	EPA 8270D	8-15-19	8-19-19	
Benzo[b]fluoranthene	**0.079**	0.041	EPA 8270D	8-15-19	8-19-19	
Benzo(j,k)fluoranthene	**0.025**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[a]pyrene	**0.046**	0.041	EPA 8270D	8-15-19	8-19-19	
Indeno[1,2,3-cd]pyrene	**0.050**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Dibenz[a,h]anthracene	**ND**	0.0082	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[g,h,i]perylene	**0.046**	0.041	EPA 8270D	8-15-19	8-19-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***37***	***21 - 107***				
Phenol-d6	***50***	***30 - 106***				
Nitrobenzene-d5	***49***	***28 - 109***				
2-Fluorobiphenyl	***55***	***37 - 107***				
2,4,6-Tribromophenol	***71***	***39 - 116***				
Terphenyl-d14	***64***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-4R-2019**					
Laboratory ID:	08-179-04					
Naphthalene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
2-Methylnaphthalene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
1-Methylnaphthalene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Dimethylphthalate	**ND**	0.029	EPA 8270D	8-15-19	8-19-19	
Acenaphthylene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Acenaphthene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Diethylphthalate	**ND**	0.029	EPA 8270D	8-15-19	8-19-19	
Fluorene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Phenanthrene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Anthracene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Di-n-butylphthalate	**ND**	0.029	EPA 8270D	8-15-19	8-19-19	
Fluoranthene	**0.0063**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Pyrene	**0.0076**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Butylbenzylphthalate	**ND**	0.029	EPA 8270D	8-15-19	8-19-19	
Benzo[a]anthracene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Chrysene	**0.0072**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
bis(2-Ethylhexyl)phthalate	**0.096**	0.029	EPA 8270D	8-15-19	8-19-19	
Di-n-octylphthalate	**ND**	0.029	EPA 8270D	8-15-19	8-19-19	
Benzo[b]fluoranthene	**0.0089**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo(j,k)fluoranthene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[a]pyrene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Indeno[1,2,3-cd]pyrene	**0.0067**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Dibenz[a,h]anthracene	**ND**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[g,h,i]perylene	**0.010**	0.0057	EPA 8270D/SIM	8-15-19	8-16-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***44***	***21 - 107***				
Phenol-d6	***57***	***30 - 106***				
Nitrobenzene-d5	***57***	***28 - 109***				
2-Fluorobiphenyl	***62***	***37 - 107***				
2,4,6-Tribromophenol	***79***	***39 - 116***				
Terphenyl-d14	***72***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0815S1					
Naphthalene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Dimethylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Acenaphthylene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Acenaphthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Diethylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Fluorene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Phenanthrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Anthracene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Di-n-butylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Pyrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Butylbenzylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Chrysene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Di-n-octylphthalate	**ND**	0.020	EPA 8270D	8-15-19	8-15-19	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270D/SIM	8-15-19	8-16-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***62***	***21 - 107***				
Phenol-d6	***71***	***30 - 106***				
Nitrobenzene-d5	***65***	***28 - 109***				
2-Fluorobiphenyl	***74***	***37 - 107***				
2,4,6-Tribromophenol	***88***	***39 - 116***				
Terphenyl-d14	***108***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0815S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.572**	**0.617**	0.800	0.800	72	77	44 - 106	8	26	
2-Chlorophenol	**0.557**	**0.622**	0.800	0.800	70	78	45 - 108	11	28	
1,4-Dichlorobenzene	**0.263**	**0.303**	0.400	0.400	66	76	40 - 109	14	31	
n-Nitroso-di-n-propylamine	**0.357**	**0.370**	0.400	0.400	89	93	47 - 108	4	24	
1,2,4-Trichlorobenzene	**0.306**	**0.342**	0.400	0.400	77	86	47 - 111	11	28	
4-Chloro-3-methylphenol	**0.655**	**0.683**	0.800	0.800	82	85	58 - 109	4	19	
Acenaphthene	**0.326**	**0.320**	0.400	0.400	82	80	54 - 105	2	19	
4-Nitrophenol	**0.790**	**0.735**	0.800	0.800	99	92	50 - 118	7	18	
2,4-Dinitrotoluene	**0.317**	**0.313**	0.400	0.400	79	78	49 - 109	1	20	
Pentachlorophenol	**0.603**	**0.583**	0.800	0.800	75	73	42 - 142	3	23	
Pyrene	**0.335**	**0.334**	0.400	0.400	84	84	57 - 110	0	16	
Surrogate:										
2-Fluorophenol					***67***	***77***	***21 - 107***			
Phenol-d6					***74***	***80***	***30 - 106***			
Nitrobenzene-d5					***73***	***78***	***28 - 109***			
2-Fluorobiphenyl					***83***	***87***	***37 - 107***			
2,4,6-Tribromophenol					***89***	***89***	***39 - 116***			
Terphenyl-d14					***101***	***109***	***41 - 113***			

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-3M-2019**					
Laboratory ID:	08-179-01					
Total Solids	**50**	0.50	SM 2540G	9-10-19	9-11-19	
Client ID:	**TOSH-3R-2019**					
Laboratory ID:	08-179-02					
Total Solids	**49**	0.50	SM 2540G	8-15-19	8-16-19	
Client ID:	**TOSH-4M-2019**					
Laboratory ID:	08-179-03					
Total Solids	**56**	0.50	SM 2540G	9-10-19	9-11-19	
Client ID:	**TOSH-4R-2019**					
Laboratory ID:	08-179-04					
Total Solids	**70**	0.50	SM 2540G	8-15-19	8-16-19	

Date of Report: September 12, 2019
Samples Submitted: August 14, 2019
Laboratory Reference: 1908-179
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G
QUALITY CONTROL

Matrix: Sediment
Units: % Solids

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-179-02								
	ORIG	DUP							
Total Solids	**48.9**	**52.0**	NA	NA	NA	NA	6	20	
Laboratory ID:	08-304-01								
	ORIG	DUP							
Total Solids	**23.2**	**23.0**	NA	NA	NA	NA	1	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

CHAIN OF CUSTODY

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Page 1 of 1

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: John Lenth

Turnaround Requested:
_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 08-179

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates							TOTAL 2045D SOLIDS
1	TOSH-3M-2019	8/13/19	1500	Sediment	1		X	X									X
2	TOSH-3R-2019	8/13/19	1500	Sediment	1	X			X	X							↓
3	TOSH-4M-2019	8/14/19	1200	Sediment	1		X	X									
4	TOSH-4R-2019	8/14/19	1200	Sediment	1	X			X	X							
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
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				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by Nina Maas Date 1350 Received by [signature] Date 8/14/19 13
Firm _____ Time _____ Firm OSE Time 1350
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

Comments:

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 12, 2019

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1908-304

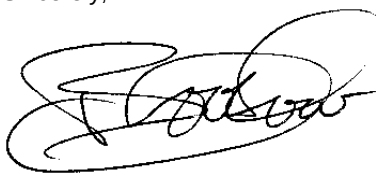
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 26, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

Case Narrative

Samples were collected on August 19 and 26, 2019 and received by the laboratory on August 26, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 6010D Analysis

The liquid portion of the sample was decanted and only the solid portion was analyzed.

Semivolatiles EPA 8270E/SIM Analysis

Sample TYLR-1R-2019 had one surrogate recovery out of control limits. This is within allowance of our standard operating procedure as long as the recovery is above 10%.

Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-2R-2019**					
Laboratory ID:	08-304-02					
Total Organic Carbon	**7.8**	0.36	EPA 9060A	9-10-19	9-10-19	
Client ID:	**TYLR-1R-2019**					
Laboratory ID:	08-304-04					
Total Organic Carbon	**0.90**	0.085	EPA 9060A	9-10-19	9-10-19	
Client ID:	**DUP-1R-2019**					
Laboratory ID:	08-304-06					
Total Organic Carbon	**0.79**	0.20	EPA 9060A	9-10-19	9-10-19	

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Solid
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0910S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	9-10-19	9-10-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-304-04								
	ORIG	DUP							
Total Organic Carbon	**0.905**	**0.924**	NA	NA	NA	NA	2	20	
SPIKE BLANK									
Laboratory ID:	SB0910S1								
	SB		SB		SB				
Total Organic Carbon	**40.9**		42.1	NA	97	90-121	NA	NA	

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

TOTAL METALS
EPA 6010D

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-2M-2019**					
Laboratory ID:	08-304-01					
Copper	**89**	4.3	EPA 6010D	9-11-19	9-11-19	
Zinc	**480**	11	EPA 6010D	9-11-19	9-11-19	
Client ID:	**TYLR-1M-2019**					
Laboratory ID:	08-304-03					
Copper	**35**	2.9	EPA 6010D	9-11-19	9-11-19	
Zinc	**290**	7.1	EPA 6010D	9-11-19	9-11-19	
Client ID:	**DUP-1M-2019**					
Laboratory ID:	08-304-05					
Copper	**31**	2.5	EPA 6010D	9-11-19	9-11-19	
Zinc	**270**	6.3	EPA 6010D	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911SM4					
Copper	**ND**	1.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**ND**	2.5	EPA 6010D	9-11-19	9-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-225-04										
	ORIG	DUP									
Copper	**4.85**	**4.28**	NA	NA		NA		NA	13	20	
Zinc	**30.7**	**29.5**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	07-225-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**52.8**	**53.6**	50.0	50.0	4.85	**96**	**97**	75-125	2	20	
Zinc	**118**	**120**	100	100	30.7	**87**	**90**	75-125	2	20	

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-2R-2019**					
Laboratory ID:	08-304-02					
Naphthalene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
2-Methylnaphthalene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
1-Methylnaphthalene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Dimethylphthalate	**ND**	0.070	EPA 8270E	8-29-19	8-29-19	
Acenaphthylene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Acenaphthene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Diethylphthalate	**ND**	0.070	EPA 8270E	8-29-19	8-29-19	
Fluorene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Phenanthrene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Anthracene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Di-n-butylphthalate	**ND**	0.070	EPA 8270E	8-29-19	8-29-19	
Fluoranthene	**0.015**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Pyrene	**0.016**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Butylbenzylphthalate	**ND**	0.070	EPA 8270E	8-29-19	8-29-19	
Benzo[a]anthracene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Chrysene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
bis(2-Ethylhexyl)phthalate	**0.24**	0.070	EPA 8270E	8-29-19	8-29-19	
Di-n-octylphthalate	**ND**	0.070	EPA 8270E	8-29-19	8-29-19	
Benzo[b]fluoranthene	**0.019**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo(j,k)fluoranthene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[a]pyrene	**0.014**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Dibenz[a,h]anthracene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[g,h,i]perylene	**ND**	0.014	EPA 8270E/SIM	8-29-19	8-29-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***51***	***21 - 107***				
Phenol-d6	***70***	***30 - 106***				
Nitrobenzene-d5	***52***	***28 - 109***				
2-Fluorobiphenyl	***67***	***37 - 107***				
2,4,6-Tribromophenol	***104***	***39 - 116***				
Terphenyl-d14	***88***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-1R-2019**					
Laboratory ID:	08-304-04					
Naphthalene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
2-Methylnaphthalene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
1-Methylnaphthalene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Dimethylphthalate	**ND**	0.028	EPA 8270E	8-29-19	8-29-19	
Acenaphthylene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Acenaphthene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Diethylphthalate	**ND**	0.028	EPA 8270E	8-29-19	8-29-19	
Fluorene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Phenanthrene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Anthracene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Di-n-butylphthalate	**ND**	0.028	EPA 8270E	8-29-19	8-29-19	
Fluoranthene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Pyrene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Butylbenzylphthalate	**ND**	0.028	EPA 8270E	8-29-19	8-29-19	
Benzo[a]anthracene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Chrysene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
bis(2-Ethylhexyl)phthalate	**0.049**	0.028	EPA 8270E	8-29-19	8-29-19	
Di-n-octylphthalate	**ND**	0.028	EPA 8270E	8-29-19	8-29-19	
Benzo[b]fluoranthene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo(j,k)fluoranthene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[a]pyrene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Dibenz[a,h]anthracene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[g,h,i]perylene	**ND**	0.0055	EPA 8270E/SIM	8-29-19	8-29-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***28***	***21 - 107***				
Phenol-d6	***48***	***30 - 106***				
Nitrobenzene-d5	***27***	***28 - 109***				Q
2-Fluorobiphenyl	***57***	***37 - 107***				
2,4,6-Tribromophenol	***102***	***39 - 116***				
Terphenyl-d14	***90***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1R-2019**					
Laboratory ID:	08-304-06					
Naphthalene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
2-Methylnaphthalene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
1-Methylnaphthalene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Dimethylphthalate	**ND**	0.027	EPA 8270E	8-29-19	8-29-19	
Acenaphthylene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Acenaphthene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Diethylphthalate	**ND**	0.027	EPA 8270E	8-29-19	8-29-19	
Fluorene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Phenanthrene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Anthracene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Di-n-butylphthalate	**ND**	0.027	EPA 8270E	8-29-19	8-29-19	
Fluoranthene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Pyrene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Butylbenzylphthalate	**ND**	0.027	EPA 8270E	8-29-19	8-29-19	
Benzo[a]anthracene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Chrysene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
bis(2-Ethylhexyl)phthalate	**0.085**	0.027	EPA 8270E	8-29-19	8-29-19	
Di-n-octylphthalate	**ND**	0.027	EPA 8270E	8-29-19	8-29-19	
Benzo[b]fluoranthene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo(j,k)fluoranthene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[a]pyrene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Dibenz[a,h]anthracene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[g,h,i]perylene	**ND**	0.0053	EPA 8270E/SIM	8-29-19	8-29-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***58***	***21 - 107***				
Phenol-d6	***70***	***30 - 106***				
Nitrobenzene-d5	***60***	***28 - 109***				
2-Fluorobiphenyl	***65***	***37 - 107***				
2,4,6-Tribromophenol	***94***	***39 - 116***				
Terphenyl-d14	***80***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0829S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Dimethylphthalate	**ND**	0.020	EPA 8270E	8-29-19	8-29-19	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Diethylphthalate	**ND**	0.020	EPA 8270E	8-29-19	8-29-19	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Di-n-butylphthalate	**ND**	0.020	EPA 8270E	8-29-19	8-29-19	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Butylbenzylphthalate	**ND**	0.020	EPA 8270E	8-29-19	8-29-19	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270E	8-29-19	8-29-19	
Di-n-octylphthalate	**ND**	0.020	EPA 8270E	8-29-19	8-29-19	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	8-29-19	8-29-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***59***	***21 - 107***				
Phenol-d6	***69***	***30 - 106***				
Nitrobenzene-d5	***59***	***28 - 109***				
2-Fluorobiphenyl	***69***	***37 - 107***				
2,4,6-Tribromophenol	***93***	***39 - 116***				
Terphenyl-d14	***83***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0829S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.576**	**0.577**	0.800	0.800	72	72	44 - 106	0	26	
2-Chlorophenol	**0.582**	**0.582**	0.800	0.800	73	73	45 - 108	0	28	
1,4-Dichlorobenzene	**0.260**	**0.268**	0.400	0.400	65	67	40 - 109	3	31	
n-Nitroso-di-n-propylamine	**0.281**	**0.296**	0.400	0.400	70	74	47 - 108	5	24	
1,2,4-Trichlorobenzene	**0.257**	**0.253**	0.400	0.400	64	63	47 - 111	2	28	
4-Chloro-3-methylphenol	**0.627**	**0.650**	0.800	0.800	78	81	58 - 109	4	19	
Acenaphthene	**0.304**	**0.313**	0.400	0.400	76	78	54 - 105	3	19	
4-Nitrophenol	**0.648**	**0.713**	0.800	0.800	81	89	50 - 118	10	18	
2,4-Dinitrotoluene	**0.330**	**0.356**	0.400	0.400	83	89	49 - 109	8	20	
Pentachlorophenol	**0.739**	**0.765**	0.800	0.800	92	96	42 - 142	3	23	
Pyrene	**0.321**	**0.343**	0.400	0.400	80	86	57 - 110	7	16	
Surrogate:										
2-Fluorophenol					***69***	***69***	***21 - 107***			
Phenol-d6					***76***	***75***	***30 - 106***			
Nitrobenzene-d5					***68***	***69***	***28 - 109***			
2-Fluorobiphenyl					***74***	***75***	***37 - 107***			
2,4,6-Tribromophenol					***90***	***96***	***39 - 116***			
Terphenyl-d14					***84***	***92***	***41 - 113***			

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-2M-2019**					
Laboratory ID:	08-304-01					
Total Solids	**23**	0.50	SM 2540G	9-10-19	9-11-19	
Client ID:	**TYLR-2R-2019**					
Laboratory ID:	08-304-02					
Total Solids	**29**	0.50	SM 2540G	8-29-19	9-4-19	
Client ID:	**TYLR-1M-2019**					
Laboratory ID:	08-304-03					
Total Solids	**35**	0.50	SM 2540G	9-10-19	9-11-19	
Client ID:	**TYLR-1R-2019**					
Laboratory ID:	08-304-04					
Total Solids	**73**	0.50	SM 2540G	8-29-19	9-4-19	
Client ID:	**DUP-1M-2019**					
Laboratory ID:	08-304-05					
Total Solids	**40**	0.50	SM 2540G	9-10-19	9-11-19	
Client ID:	**DUP-1R-2019**					
Laboratory ID:	08-304-06					
Total Solids	**75**	0.50	SM 2540G	8-29-19	9-4-19	

Date of Report: September 12, 2019
Samples Submitted: August 26, 2019
Laboratory Reference: 1908-304
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G
QUALITY CONTROL

Matrix: Sediment
Units: % Solids

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-304-01								
	ORIG	DUP							
Total Solids	**23.2**	**23.0**	NA	NA	NA	NA	1	20	
Laboratory ID:	08-304-04								
	ORIG	DUP							
Total Solids	**72.7**	**66.4**	NA	NA	NA	NA	9	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: HEC
Project Number: 14-05806-000
Project Name: RPWS
Project Manager: John Lenth
Sampled by: Brianna Blaud

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 08-304

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	~~Total RCRA Metals~~ Copper	~~Total MTCA Metals~~ Zinc	TCLP Metals	HEM (oil and grease) 1664A	Total organic carbon	PAHs	Phthalates		~~% Moisture~~ Total Solids 25406
1	TYLR-2M-2019	8.19.19	1045	sediment	1														X	X							8
2	TYLR-2R-2019	8.19.19	1045		1																		X	X	X		
3	TYLR-1M-2019	8.20.19	1140		1														X	X							
4	TYLR-1R-2019				1																		X	X	X		
5	DUP-1M-2019				1														X	X							
6	DUP-1R-2019				1																		X	X	X		

	Signature	Company	Date	Time
Relinquished	Brianna Blaud	HEC	8.20.19	1550
Received		CORE	8/26/19	1550
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 12, 2019

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1908-364

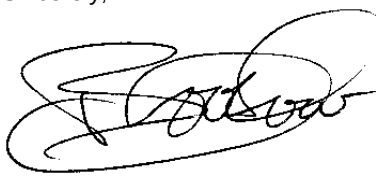
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 29, 2019.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



Blair Goodrow
Project Manager

Enclosures

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

Case Narrative

Samples were collected on August 29, 2019 and received by the laboratory on August 29, 2019. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 6010D Analysis

The liquid portion of the sample was decanted and only the solid portion was analyzed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY-1R-2019**					
Laboratory ID:	08-364-02					
Total Organic Carbon	**2.8**	0.21	EPA 9060A	9-11-19	9-11-19	
Client ID:	**EVAMS-R-2019**					
Laboratory ID:	08-364-03					
Total Organic Carbon	**17**	0.82	EPA 9060A	9-11-19	9-11-19	
Client ID:	**MONT-1R-2019**					
Laboratory ID:	08-364-05					
Total Organic Carbon	**5.3**	0.21	EPA 9060A	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Solid
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	9-11-19	9-11-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-364-02								
	ORIG	DUP							
Total Organic Carbon	**2.80**	**3.30**	NA	NA	NA	NA	16	20	
SPIKE BLANK									
Laboratory ID:	SB0911S1								
	SB		SB		SB				
Total Organic Carbon	**40.8**		42.1	NA	97	90-121	NA	NA	

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

TOTAL METALS
EPA 6010D

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY-1M-2019**					
Laboratory ID:	08-364-01					
Copper	**32**	2.6	EPA 6010D	9-11-19	9-11-19	
Zinc	**340**	6.4	EPA 6010D	9-11-19	9-11-19	
Client ID:	**EVAMS-M-2019**					
Laboratory ID:	08-364-04					
Copper	**16**	5.3	EPA 6010D	9-11-19	9-11-19	
Zinc	**76**	13	EPA 6010D	9-11-19	9-11-19	
Client ID:	**MONT-1M-2019**					
Laboratory ID:	08-364-06					
Copper	**29**	4.8	EPA 6010D	9-11-19	9-11-19	
Zinc	**380**	12	EPA 6010D	9-11-19	9-11-19	

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911SM4					
Copper	**ND**	1.0	EPA 6010D	9-11-19	9-11-19	
Zinc	**ND**	2.5	EPA 6010D	9-11-19	9-11-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-225-04										
	ORIG	DUP									
Copper	**4.85**	**4.28**	NA	NA		NA		NA	13	20	
Zinc	**30.7**	**29.5**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	07-225-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**52.8**	**53.6**	50.0	50.0	4.85	**96**	**97**	75-125	2	20	
Zinc	**118**	**120**	100	100	30.7	**87**	**90**	75-125	2	20	

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY-1R-2019**					
Laboratory ID:	08-364-02					
Naphthalene	**ND**	0.011	EPA 8270E/SIM	9-4-19	9-4-19	
2-Methylnaphthalene	**ND**	0.011	EPA 8270E/SIM	9-4-19	9-4-19	
1-Methylnaphthalene	**ND**	0.011	EPA 8270E/SIM	9-4-19	9-4-19	
Dimethylphthalate	**ND**	0.054	EPA 8270E	9-4-19	9-6-19	
Acenaphthylene	**0.014**	0.011	EPA 8270E/SIM	9-4-19	9-4-19	
Acenaphthene	**0.022**	0.011	EPA 8270E/SIM	9-4-19	9-4-19	
Diethylphthalate	**ND**	0.054	EPA 8270E	9-4-19	9-6-19	
Fluorene	**0.031**	0.011	EPA 8270E/SIM	9-4-19	9-4-19	
Phenanthrene	**0.30**	0.054	EPA 8270E	9-4-19	9-6-19	
Anthracene	**0.066**	0.054	EPA 8270E	9-4-19	9-6-19	
Di-n-butylphthalate	**ND**	0.054	EPA 8270E	9-4-19	9-6-19	
Fluoranthene	**0.43**	0.054	EPA 8270E	9-4-19	9-6-19	
Pyrene	**0.44**	0.054	EPA 8270E	9-4-19	9-6-19	
Butylbenzylphthalate	**ND**	0.054	EPA 8270E	9-4-19	9-6-19	
Benzo[a]anthracene	**0.19**	0.054	EPA 8270E	9-4-19	9-6-19	
Chrysene	**0.22**	0.054	EPA 8270E	9-4-19	9-6-19	
bis(2-Ethylhexyl)phthalate	**0.25**	0.054	EPA 8270E	9-4-19	9-6-19	
Di-n-octylphthalate	**ND**	0.054	EPA 8270E	9-4-19	9-6-19	
Benzo[b]fluoranthene	**0.25**	0.054	EPA 8270E	9-4-19	9-6-19	
Benzo(j,k)fluoranthene	**0.094**	0.054	EPA 8270E	9-4-19	9-6-19	
Benzo[a]pyrene	**0.18**	0.054	EPA 8270E	9-4-19	9-6-19	
Indeno[1,2,3-cd]pyrene	**0.11**	0.054	EPA 8270E	9-4-19	9-6-19	
Dibenz[a,h]anthracene	**0.034**	0.011	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo[g,h,i]perylene	**0.13**	0.054	EPA 8270E	9-4-19	9-6-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***55***	***21 - 107***				
Phenol-d6	***70***	***30 - 106***				
Nitrobenzene-d5	***62***	***28 - 109***				
2-Fluorobiphenyl	***73***	***37 - 107***				
2,4,6-Tribromophenol	***80***	***39 - 116***				
Terphenyl-d14	***74***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS-R-2019**					
Laboratory ID:	08-364-03					
Naphthalene	**ND**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
2-Methylnaphthalene	**ND**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
1-Methylnaphthalene	**ND**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Dimethylphthalate	**ND**	0.095	EPA 8270E	9-4-19	9-6-19	
Acenaphthylene	**ND**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Acenaphthene	**0.023**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Diethylphthalate	**ND**	0.095	EPA 8270E	9-4-19	9-6-19	
Fluorene	**ND**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Phenanthrene	**0.085**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Anthracene	**ND**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Di-n-butylphthalate	**ND**	0.095	EPA 8270E	9-4-19	9-6-19	
Fluoranthene	**0.13**	0.095	EPA 8270E	9-4-19	9-6-19	
Pyrene	**0.13**	0.095	EPA 8270E	9-4-19	9-6-19	
Butylbenzylphthalate	**ND**	0.095	EPA 8270E	9-4-19	9-6-19	
Benzo[a]anthracene	**0.051**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Chrysene	**0.058**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
bis(2-Ethylhexyl)phthalate	**0.26**	0.095	EPA 8270E	9-4-19	9-6-19	
Di-n-octylphthalate	**ND**	0.095	EPA 8270E	9-4-19	9-6-19	
Benzo[b]fluoranthene	**0.079**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo(j,k)fluoranthene	**0.021**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo[a]pyrene	**0.062**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Indeno[1,2,3-cd]pyrene	**0.047**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Dibenz[a,h]anthracene	**ND**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo[g,h,i]perylene	**0.042**	0.019	EPA 8270E/SIM	9-4-19	9-4-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***42***	***21 - 107***				
Phenol-d6	***60***	***30 - 106***				
Nitrobenzene-d5	***45***	***28 - 109***				
2-Fluorobiphenyl	***61***	***37 - 107***				
2,4,6-Tribromophenol	***80***	***39 - 116***				
Terphenyl-d14	***71***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-1R-2019**					
Laboratory ID:	08-364-05					
Naphthalene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
2-Methylnaphthalene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
1-Methylnaphthalene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Dimethylphthalate	**ND**	0.058	EPA 8270E	9-4-19	9-6-19	
Acenaphthylene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Acenaphthene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Diethylphthalate	**ND**	0.058	EPA 8270E	9-4-19	9-6-19	
Fluorene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Phenanthrene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Anthracene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Di-n-butylphthalate	**ND**	0.058	EPA 8270E	9-4-19	9-6-19	
Fluoranthene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Pyrene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Butylbenzylphthalate	**ND**	0.058	EPA 8270E	9-4-19	9-6-19	
Benzo[a]anthracene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Chrysene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
bis(2-Ethylhexyl)phthalate	**0.17**	0.058	EPA 8270E	9-4-19	9-6-19	
Di-n-octylphthalate	**ND**	0.058	EPA 8270E	9-4-19	9-6-19	
Benzo[b]fluoranthene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo(j,k)fluoranthene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo[a]pyrene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Dibenz[a,h]anthracene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo[g,h,i]perylene	**ND**	0.012	EPA 8270E/SIM	9-4-19	9-4-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***58***	***21 - 107***				
Phenol-d6	***70***	***30 - 106***				
Nitrobenzene-d5	***59***	***28 - 109***				
2-Fluorobiphenyl	***59***	***37 - 107***				
2,4,6-Tribromophenol	***79***	***39 - 116***				
Terphenyl-d14	***65***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0904S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Dimethylphthalate	**ND**	0.020	EPA 8270E	9-4-19	9-4-19	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Diethylphthalate	**ND**	0.020	EPA 8270E	9-4-19	9-4-19	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Di-n-butylphthalate	**ND**	0.020	EPA 8270E	9-4-19	9-4-19	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Butylbenzylphthalate	**ND**	0.020	EPA 8270E	9-4-19	9-4-19	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270E	9-4-19	9-4-19	
Di-n-octylphthalate	**ND**	0.020	EPA 8270E	9-4-19	9-4-19	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	9-4-19	9-4-19	
Surrogate:	***Percent Recovery***	***Control Limits***				
2-Fluorophenol	***68***	***21 - 107***				
Phenol-d6	***78***	***30 - 106***				
Nitrobenzene-d5	***68***	***28 - 109***				
2-Fluorobiphenyl	***77***	***37 - 107***				
2,4,6-Tribromophenol	***94***	***39 - 116***				
Terphenyl-d14	***91***	***41 - 113***				

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0904S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.506**	**0.553**	0.800	0.800	63	69	44 - 106	9	26	
2-Chlorophenol	**0.521**	**0.570**	0.800	0.800	65	71	45 - 108	9	28	
1,4-Dichlorobenzene	**0.230**	**0.268**	0.400	0.400	58	67	40 - 109	15	31	
n-Nitroso-di-n-propylamine	**0.257**	**0.275**	0.400	0.400	64	69	47 - 108	7	24	
1,2,4-Trichlorobenzene	**0.221**	**0.252**	0.400	0.400	55	63	47 - 111	13	28	
4-Chloro-3-methylphenol	**0.610**	**0.610**	0.800	0.800	76	76	58 - 109	0	19	
Acenaphthene	**0.293**	**0.302**	0.400	0.400	73	76	54 - 105	3	19	
4-Nitrophenol	**0.629**	**0.630**	0.800	0.800	79	79	50 - 118	0	18	
2,4-Dinitrotoluene	**0.323**	**0.323**	0.400	0.400	81	81	49 - 109	0	20	
Pentachlorophenol	**0.687**	**0.694**	0.800	0.800	86	87	42 - 142	1	23	
Pyrene	**0.326**	**0.333**	0.400	0.400	82	83	57 - 110	2	16	
Surrogate:										
2-Fluorophenol					***59***	***64***	***21 - 107***			
Phenol-d6					***67***	***73***	***30 - 106***			
Nitrobenzene-d5					***59***	***64***	***28 - 109***			
2-Fluorobiphenyl					***68***	***72***	***37 - 107***			
2,4,6-Tribromophenol					***88***	***88***	***39 - 116***			
Terphenyl-d14					***82***	***85***	***41 - 113***			

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY-1M-2019**					
Laboratory ID:	08-364-01					
Total Solids	**39**	0.50	SM 2540G	9-4&10-19	9-5&11-19	
Client ID:	**CTRY-1R-2019**					
Laboratory ID:	08-364-02					
Total Solids	**56**	0.50	SM 2540G	9-4&10-19	9-5&11-19	
Client ID:	**EVAMS-R-2019**					
Laboratory ID:	08-364-03					
Total Solids	**21**	0.50	SM 2540G	9-4&10-19	9-5&11-19	
Client ID:	**EVAMS-M-2019**					
Laboratory ID:	08-364-04					
Total Solids	**19**	0.50	SM 2540G	9-4&10-19	9-5&11-19	
Client ID:	**MONT-1R-2019**					
Laboratory ID:	08-364-05					
Total Solids	**34**	0.50	SM 2540G	9-4&10-19	9-5&11-19	
Client ID:	**MONT-1M-2019**					
Laboratory ID:	08-364-06					
Total Solids	**21**	0.50	SM 2540G	9-4&10-19	9-5&11-19	

Date of Report: September 12, 2019
Samples Submitted: August 29, 2019
Laboratory Reference: 1908-364
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G
QUALITY CONTROL

Matrix: Sediment
Units: % Solids

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-304-01								
	ORIG	DUP							
Total Solids	**23.2**	**23.0**	NA	NA	NA	NA	1	20	
Laboratory ID:	08-364-02								
	ORIG	DUP							
Total Solids	**55.8**	**58.4**	NA	NA	NA	NA	5	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: HEC
Project Number: 14-058016-000
Project Name: RPWS
Project Manager: John Lenth
Sampled by: Brianna Bland, Nina Maas

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 08-364

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	TOTAL dissolved organic carbon	PAHs	Phthalates		% Moisture
1	CTRY-1M-2019	8.29.19	1030	Sediment	1														X	X							78
2	CTRY-1R-2019		1030		1																		X	X	X		
3	EVAMS-R-2019		1115		1																		X	X	X		
4	EVAMS-M-2019		1115		1														X	X							
5	MONT-1R-2019		1145		1																		X	X	X		
6	MONT-1M-2019		1145		1														X	X							

	Signature	Company	Date	Time
Relinquished		HEC	8.29.19	1225
Received		CTE	8/29/19	1225
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

APPENDIX P

Data Validation Memorandum for Sediment Quality Monitoring

Herrera Environmental Consultants, Inc.

Internal Memorandum

Date: December 19, 2019

To: Project File 14-05806-019

Copy To:

From: Gina Catarra

Subject: Data Quality Assurance Review of the Redmond Paired Watershed Stormwater Retrofit Effectiveness Sediment Quality Monitoring Data

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This memorandum presents a review of data quality for 21 sediment samples (including one field duplicate) collected for the Redmond Paired Watershed Stormwater Retrofit Effectiveness Study between July 11 and August 29, 2019. Onsite Environmental, Inc., of Redmond, Washington analyzed the samples for:

- Total organic carbon (TOC) by EPA method 9060A
- Metals (copper and zinc) by EPA method 6020
- Polycyclic aromatic hydrocarbons (PAHs) by EPA method 8270D/SIM
- Phthalates by EPA method 8270D.

Results for the following samples were validated.

Date Collected	Lab SDG	Samples Collected	QC Samples Collected
7/11-19/19	1907-225	TOSH-1, TOSH-2, and MONT-5	None
7/23-26/19	1907-316	COLIN, MONT-2, and MONT-3	None
7/25-32/19	1908-092	CTRY-2, CTRY-1, EVALSS, SIDL-3, SIDL-1, and SIDL-2	None
8/09-19/18	1908-130	MONT-4	None
8/13-14/19	1908-179	TOSH-3, TOSH-4	None
8/19-26/19	1908-304	TYLR-2, TYLR-1	1 field duplicate (DUP)
8/29/19	1908-364	CTRY-1, EVAMS, MONT-1	None

The laboratory's performance was reviewed in accordance with quality control (QC) criteria established in the *Redmond Paired Watershed Study Quality Assurance Project Plan* (QAPP) (Herrera 2015), by the laboratory, and in the specified methods.

Quality control data summaries submitted by the laboratory were reviewed; raw data were not submitted by the laboratory. Data Quality Assurance Worksheets were completed for each laboratory report and are included as an Attachment to this memorandum. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by definitions of data qualifiers.

Custody, Preservation, Holding Times, and Completeness—Acceptable

The samples were properly preserved and sample custody was maintained from sample collection to receipt at the laboratory. Samples were analyzed within the required method holding times. The laboratory reports were complete and contained results for all samples and tests requested on the chain-of-custody (COC) forms.

Laboratory Reporting Limits—Acceptable

The laboratory reporting limits met those established in the QAPP. No data were qualified based on laboratory reporting limits.

Method Blank Analysis—Acceptable

Method blanks were analyzed at the required frequency. Method blanks did not contain levels of target analytes above the laboratory reporting limits.

Laboratory Control Sample Analysis—Acceptable

Blank spike/blank spike duplicate (BS/BSD) samples were analyzed with project samples for TOC, PAHs, and phthalates at the required frequency. The percent recovery values for all parameters met the criteria established in the QAPP.

Surrogate Compound Analysis—Acceptable with Discussion

Surrogates were analyzed with project samples, method blanks, and laboratory duplicates for PAHs and phthalates, as required by the analytical methods. The percent recovery values for all surrogate compounds met the criteria established by the laboratory, with the exception noted below.

Sample TYLR-1 had one surrogate (nitrobenzene-d5) with a percent recovery value (27 percent) outside of the 28 to 109 percent control limits established by the laboratory. However, no data were qualified because all other surrogate recovery values met criteria and the surrogate recovery was greater than 10 percent.

Matrix Spike Analysis—Acceptable

Matrix spike/matrix spike duplicate (MS/MSD) samples were analyzed for copper and zinc at the required frequency. The percent recovery values for copper (96 and 97 percent) and zinc (87 and 90 percent) met the control limits (75 to 125 pecent) established in the QAPP.

Laboratory Duplicate Analysis—Acceptable

Laboratory duplicate samples were analyzed for TOC, copper, and zinc; BS/BSD samples were analyzed for PAHs and phthalates. The relative percent difference (RPD) was calculated for each analyte where both duplicate values were greater than five times the reporting limit (RL). The difference between duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the duplicate. The RPD values or difference values met the control limits established by the QAPP.

Field Duplicate Analysis—Acceptable

A field duplicate (QA) of sample TYLR-1 was collected and analyzed for all parameters. However, the QAPP specifies that two field duplicate samples will be collected and analyzed for each annual sampling event. The RPD was calculated for each analyte where both the values were greater than five times the RL. The difference between the duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the field duplicate. The RPD values or difference values met the control limits established in the QAPP.

Definition of Data Qualifiers

The following are data qualifier definitions applied for this project.

Data Qualifier	Definition
J	Value is an estimate based on analytical results
R	Value is rejected based on analytical results
U	Value is below the reporting limit
UJ	Value is below the reporting limit and is an estimate based on analytical results

References

Herrera. 2015. Redmond Paired Watershed Study Quality Assurance Project Plan. Prepared by Herrera Environmental Consultants, Inc., Seattle, Washington. December 31.

APPENDIX Q

Laboratory Report for Biological Monitoring

The contents of this appendix are provided in an electronic file only.

APPENDIX R

Quality Assurance Review Documentation for Biological Monitoring

Project_ID	Sample_ID	Sample_Station_Name	Sample_Client_ID	Sample_Date_ Collected	Sample_Sort_ Efficiency	Sample_QA_ Similarity	Percent_Taxonomic_ Disagreement	Percent_Difference_ Enumeration
HEC19JL	HEC19JL001	Colin Creek	COLIN-1	7/2/2019				
HEC19JL	HEC19JL002	Country Creek	CTRY-1	7/31/2019				
HEC19JL	HEC19JL003	Country Creek	CTRY-2	8/6/2019				
HEC19JL	HEC19JL004	Evans Tributary	EVALSS	7/31/2019				
HEC19JL	HEC19JL005	Evans Tributary	EVAMSS	8/2/2019	98.32%	97.78%	3.51%	1.33%
HEC19JL	HEC19JL006	Monticello Creek	MONT-1	8/7/2019				
HEC19JL	HEC19JL007	Monticello Creek	MONT-2	7/26/2019				
HEC19JL	HEC19JL008	Monticello Creek	MONT-3	7/23/2019				
HEC19JL	HEC19JL009	Monticello Creek	MONT-4	8/9/2019	97.83%			
HEC19JL	HEC19JL010	Monticello Creek	MONT-5	7/11/2019		98.27%	2.17%	0.45%
HEC19JL	HEC19JL011	Seidel Creek	SIDL-1	7/18/2019				
HEC19JL	HEC19JL012	Seidel Creek	SIDL-2	7/25/2019				
HEC19JL	HEC19JL013	Seidel Creek	SIDL-3	7/30/2019				
HEC19JL	HEC19JL014	Tosh Creek	TOSH-1	7/19/2019				
HEC19JL	HEC19JL015	Tosh Creek	TOSH-2	7/12/2019				
HEC19JL	HEC19JL016	Tosh Creek	TOSH-3	8/13/2019				
HEC19JL	HEC19JL017	Tosh Creek	TOSH-4	8/14/2019				
HEC19JL	HEC19JL018	Tyler's Creek	TYLR-1	8/26/2019				
HEC19JL	HEC19JL019	Tyler's Creek	TYLR-2	8/19/2019				