REDMOND PAIRED WATERSHED STUDY

WATER YEAR 2020 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 print correctly when duplexed.

REDMOND PAIRED WATERSHED STUDY

WATER YEAR 2020 DATA SUMMARY REPORT

Prepared for
City of Redmond
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Redmond, Washington 98052

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December 13, 2021

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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 (TAC) that was formed for the study. This technical advisory committee currently includes representation from the following jurisdictions and agencies:

City of Redmond

City of Seattle

King County

US Environmental Protection Agency

US Geological Survey

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 time frame. 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, 2020a) were prepared previously for data collected over water years 2016, 2017, 2018, and 2019 (WY2016, WY2017, WY2018, WY2019), 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. 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. A trend analysis report (Herrera 2020b) was prepared following year 4 of the RPWS's implementation.

This document represents the data summary report for monitoring that occurred over water year 2020 (WY2020) 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 and redevelopment (onsite stormwater management, runoff treatment, and flow control facilities). Ideally, 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 could include facilities for onsite stormwater management (e.g., low impact development [LID] practices, runoff treatment, and flow control)
- Onsite stormwater management facilities required due to Municipal Stormwater Permit requirements for development and redevelopment
- 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 time frame 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 time frame. 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.

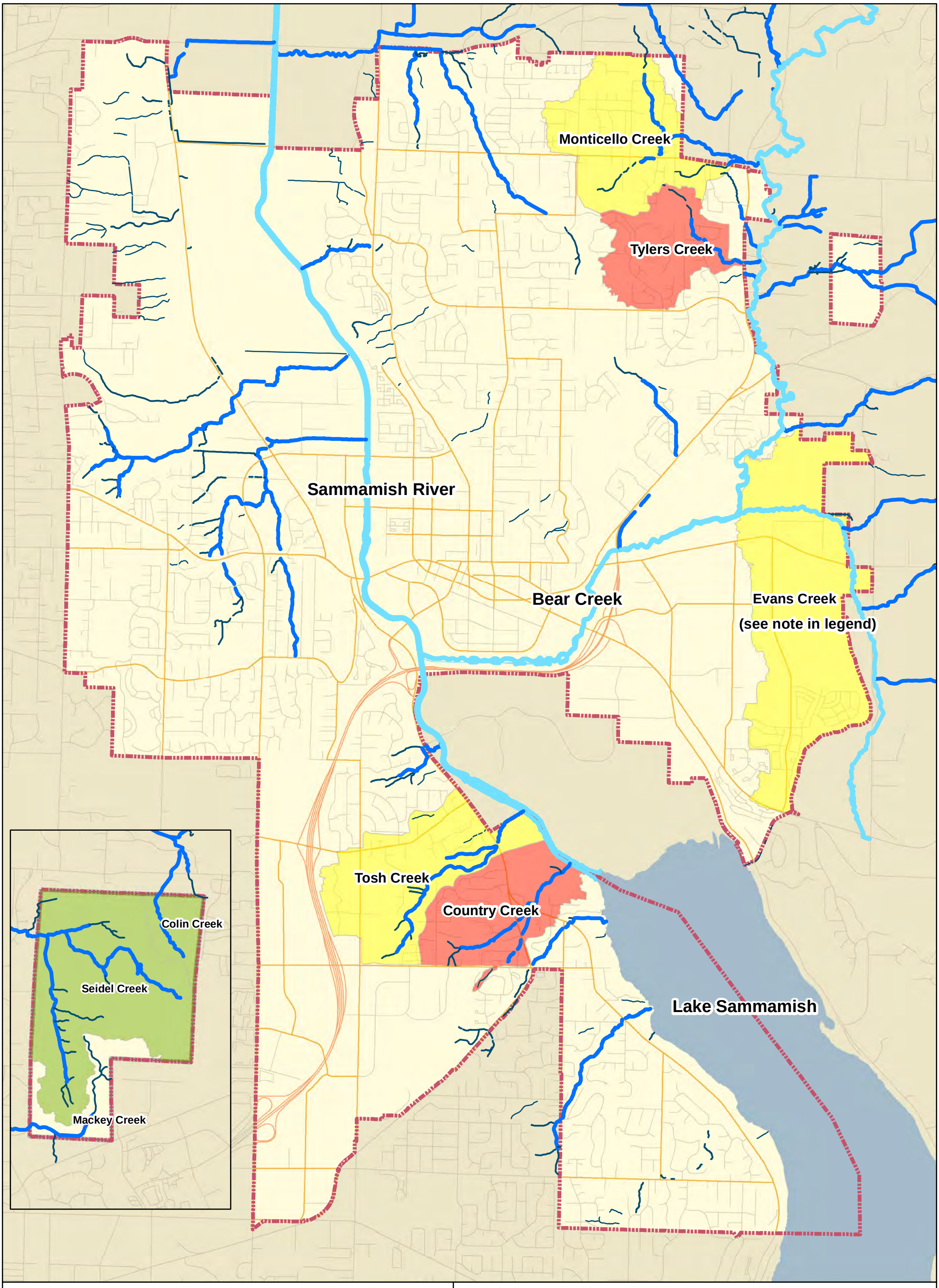

Figure 1. Application, Reference, and Control Watersheds.

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).

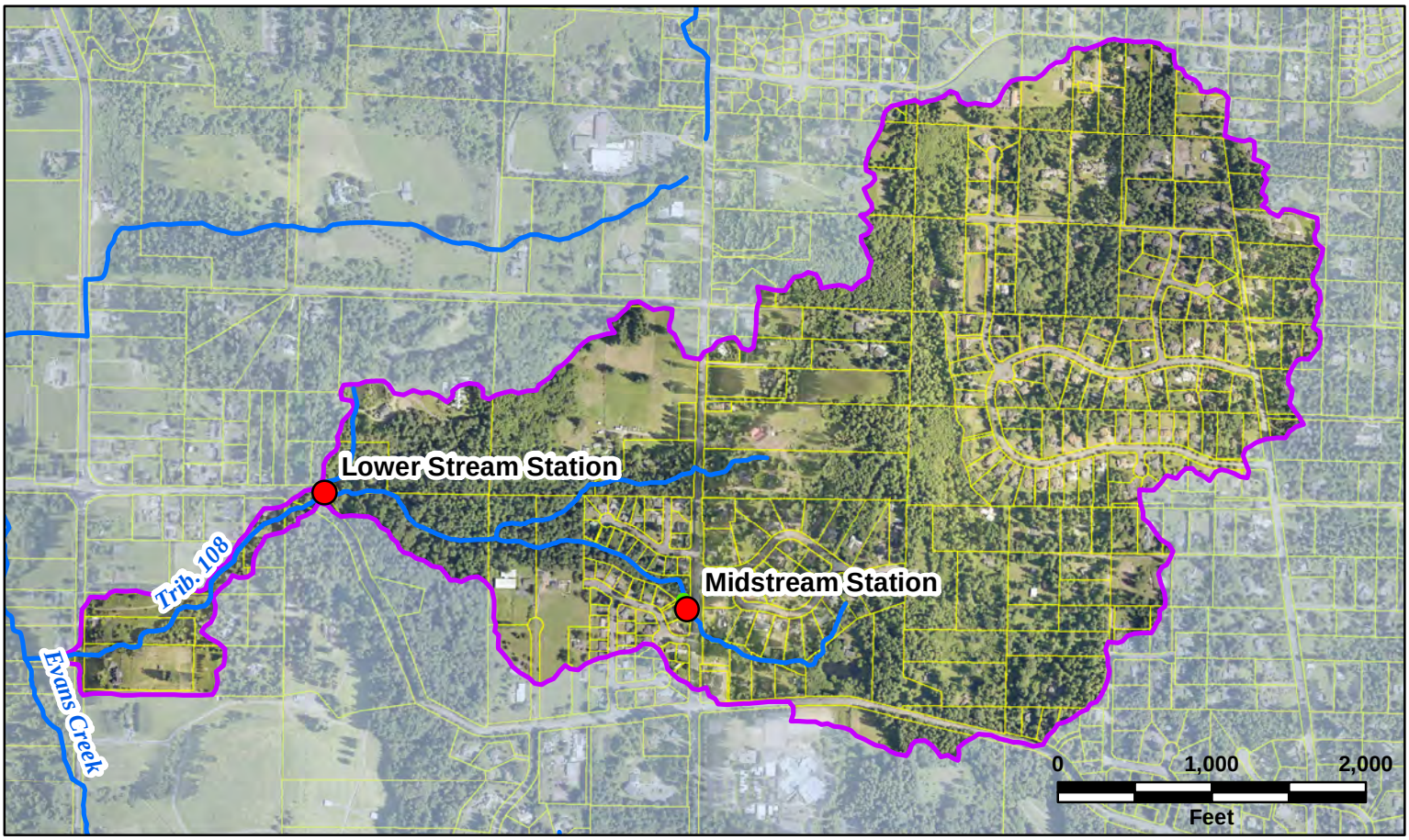

Figure 2. Evans Trib. 108 Paired Watershed Study Monitoring Locations.

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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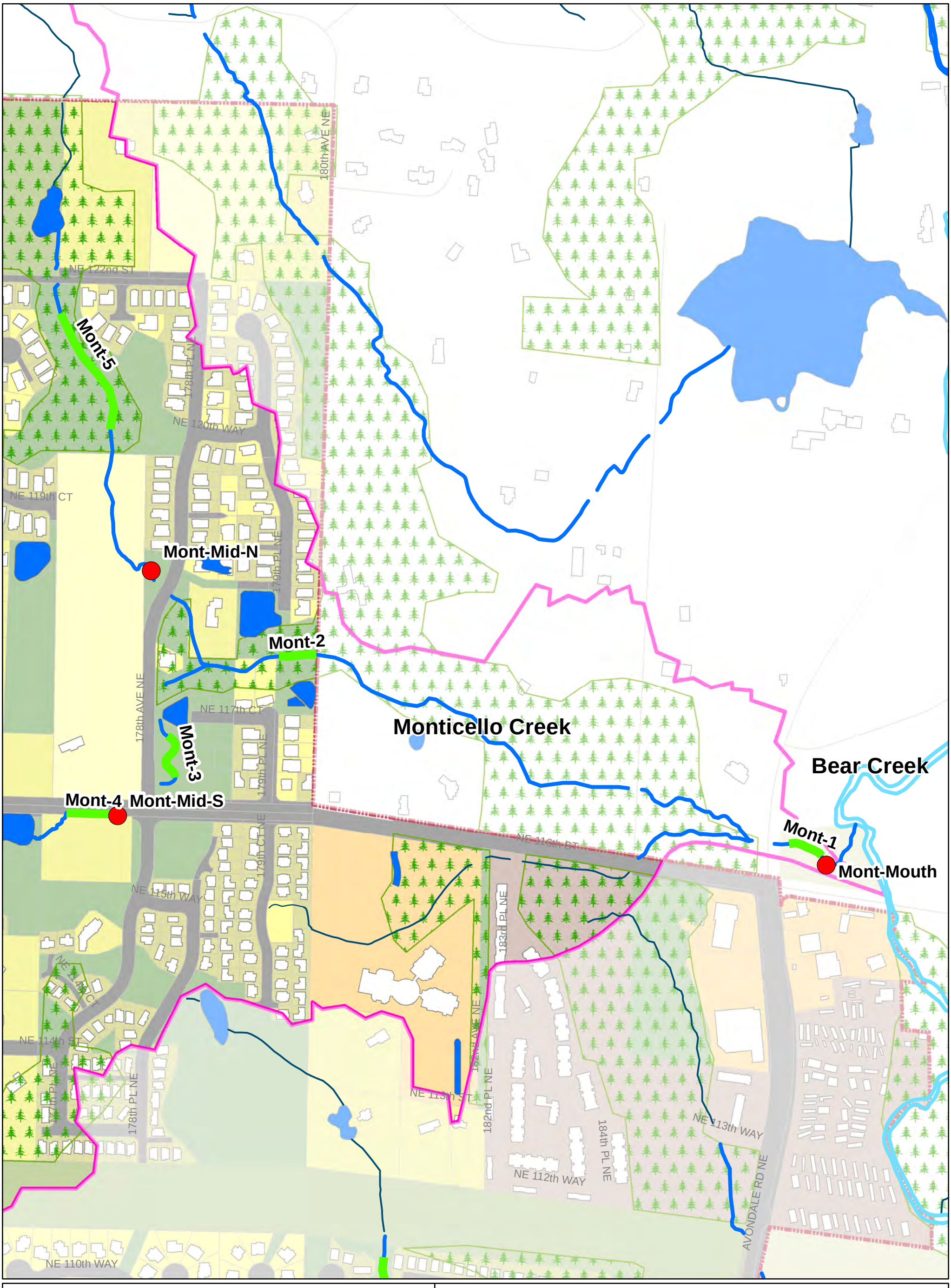

Figure 3. Monticello Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

6/25/2015

N

0 0.0375 0.075 0.15 Miles

CityofRedmond WASHINGTON

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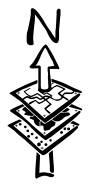
Legend

- 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 flow pulse:** 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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- 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

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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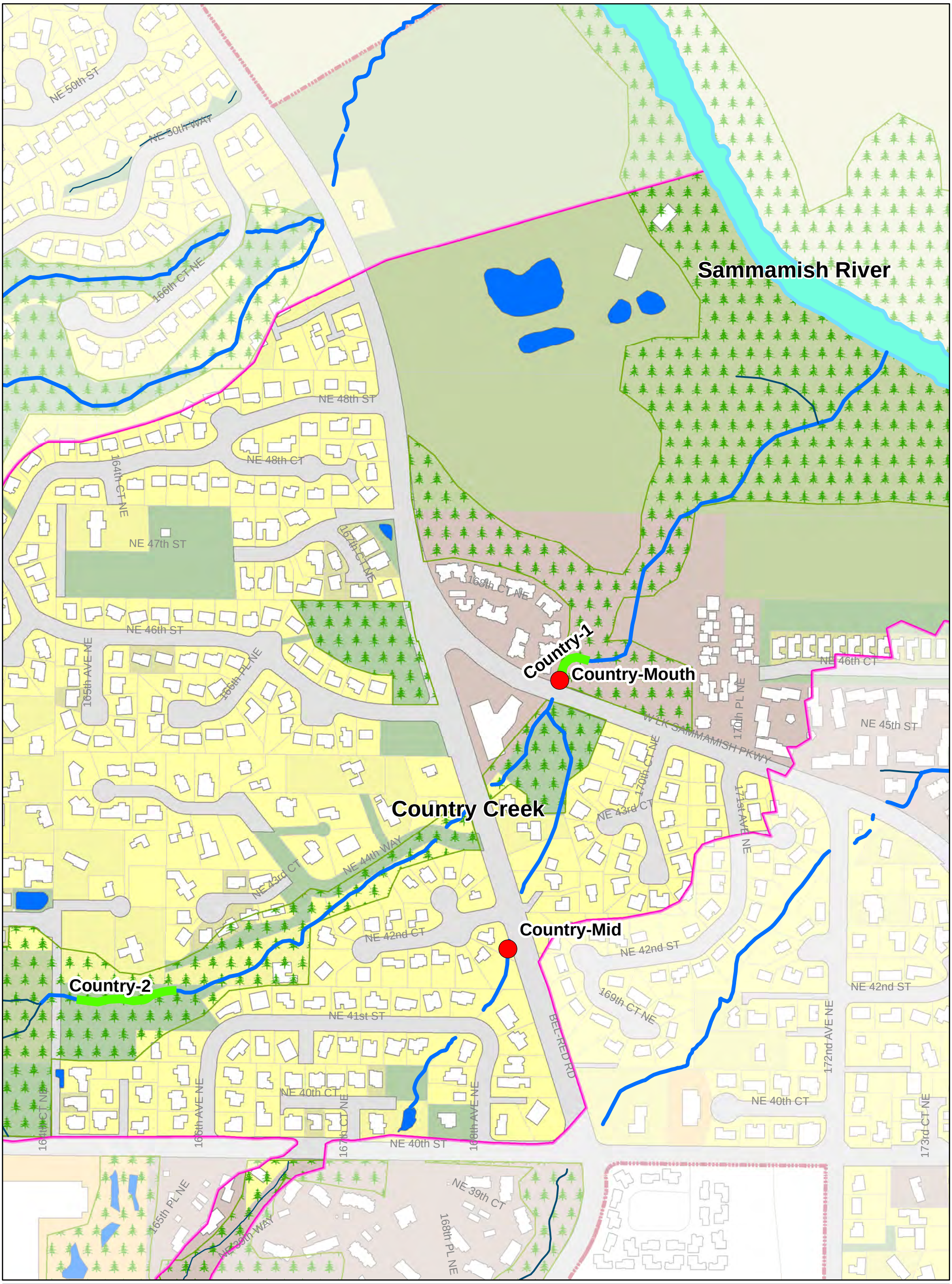

Figure 7. Country Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

6/25/2015

N

0 0.0325 0.065 0.13 Miles

CityofRedmond

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

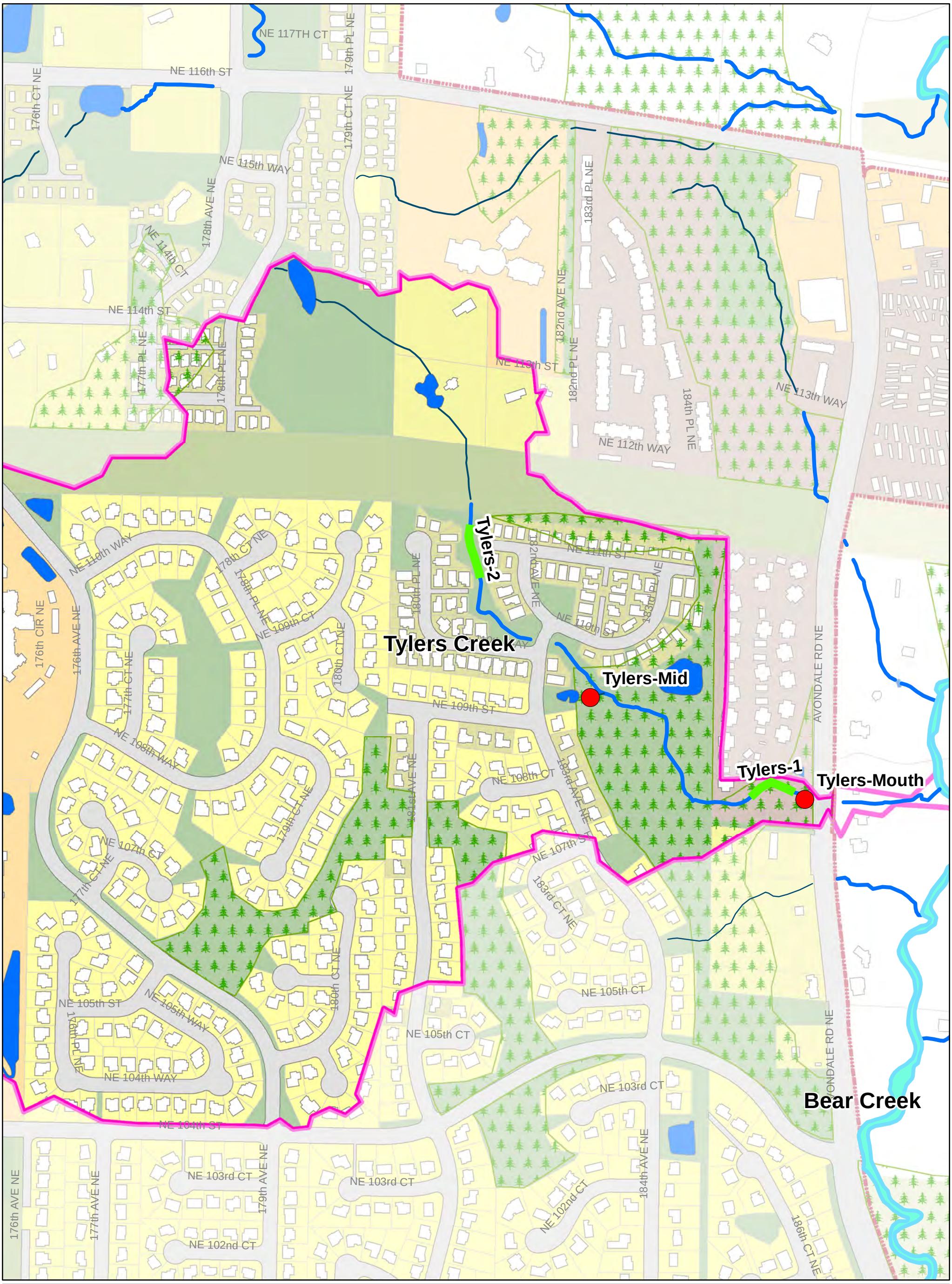

Figure 8. Tyler's Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington

6/25/2015

N

0 0.0375 0.075 0.15 Miles

CityofRedmond WASHINGTON

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- Single Family HighDensity
- 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 2018) 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.

In April 2021, the City retrofitted two existing stormwater detention ponds in the Monticello Creek watershed with a continuous monitoring and adaptive control (CMAC) system to improve their performance for managing peak flows during storm events. The CMAC system is designed to optimize the performance of existing stormwater detention facilities by leveraging forecast information with onsite sensors, allowing adaptive use of the full storage volume available to mimic flow patterns that existed prior to land development. A proposal (Herrera 2021) to conduct effectiveness monitoring on these ponds using funding from the SAM program is currently being reviewed by Ecology.

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.

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 twice per month. 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. A more detailed summary of the street sweeping is provided in Table 3.

    Note: Trend analyses performed by Herrera (2020b, 2020c) documented a consistent and statistically significant decrease in total suspended solids and total copper concentrations in Monticello Creek that appeared to be related to the increase in street sweeping frequency. These results are also consistent with a street sweeping study that was implemented by Seattle Public Utilities, circa 2018.

- 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*).

Table 3. Summary of Street Sweeping in the Monticello Creek Watershed.

Type of sweeper:	Regenerative
Percent of road cover within the basin: 83%	83% (the City did not sweep the 1.24 miles of private roads within watershed due to access issues)
Type of public roads and percent of each:	• Principal Arterial: 4% • Collector Arterial: 9% • Connector Streets: 4% • Local Access: 83%
Miles swept per year:	• Monthly: July 2017–August 2018. A total of 83.44 miles were swept during these 14 months. • Twice Monthly: September 2018–August 2019. A total of 143.04 miles were swept during these 12 months.
Average passes per year:	• Monthly: July 2017–August 2018. The watershed was swept 14 times during this time period. The biweekly sweeping was supposed to start in July 2018; however, due to an error, the contractor continued monthly sweeping until August 2018. This was addressed by adding 2 months of sweeping twice per month to the end of the contract. • Twice Monthly: September 2018–August 2019. The watershed was swept 24 times during this time period. No months were missed.

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 WY2020:

- 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.

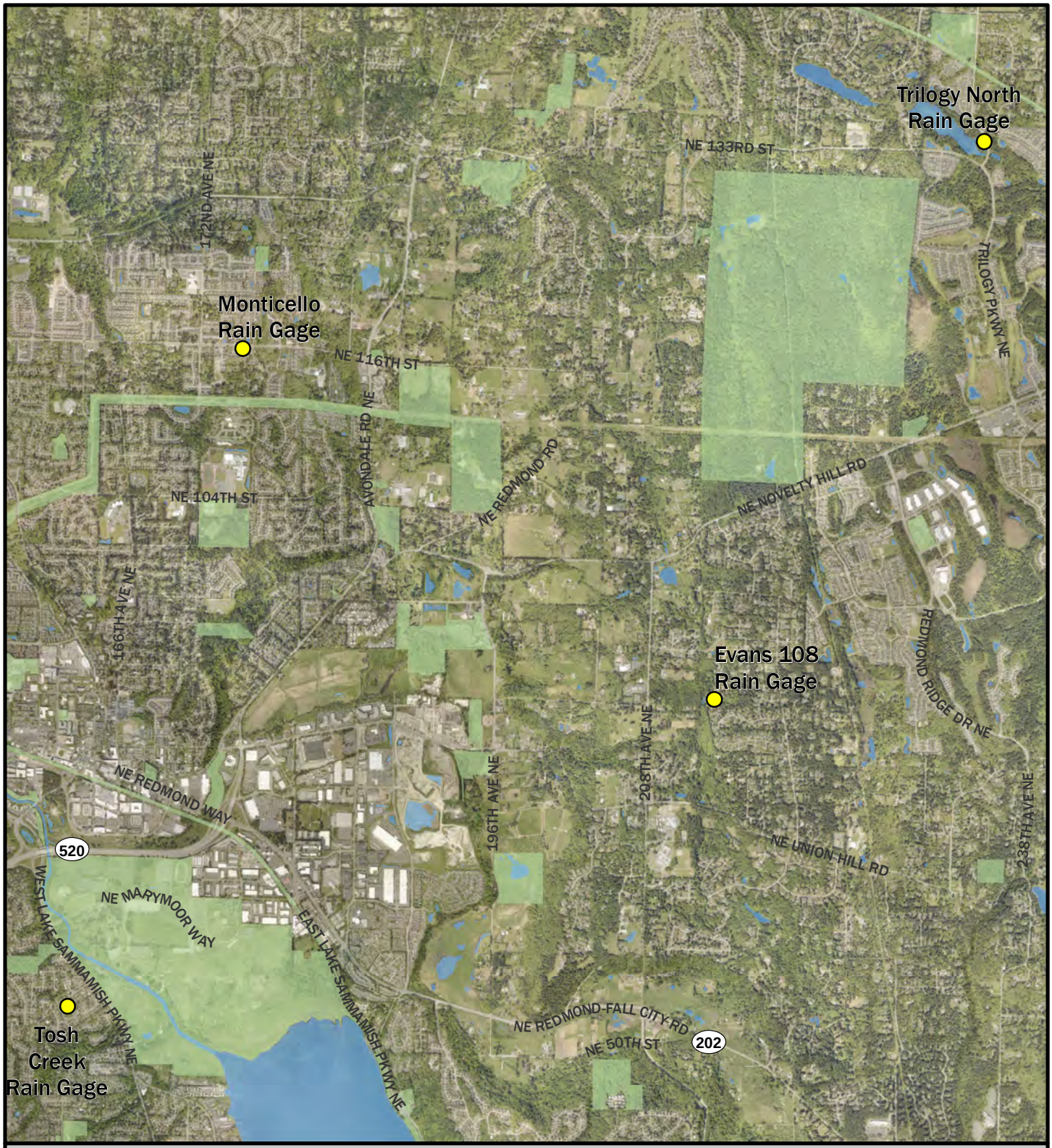
MONITORING RESULTS SUMMARY

This section summarizes results for the Status and Trends Monitoring component of the RPWS from monitoring that was conducted over WY2020; 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 WY2020. A trend analysis report (Herrera 2020b) was prepared following year 4 of the RPWS's implementation. Another trend analysis report will be prepared in 2022 following year 6 of the RPWS' implementation.

HYDROLOGIC MONITORING

Hydrologic monitoring for WY2020 initiated on October 1, 2019, at the 14 fixed monitoring stations that are identified in the *Experimental Design* section of this document and continued through September 30, 2020. 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 station 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 WY2020 and through the end of the 2020 calendar year (December 31, 2020). 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:

- COUMI: Poor record. Section control was very unstable. Pressure transducer prone to plugging by sediment, which produces poor continuous stage record. Wave dynamic at outlet of culvert affects high flow water level. Downstream site more promising and will be investigated. A data gap from February 5, 2020, to March 5, 2020, was filled with data copied from TYLMI, a station with a similar hydrograph form and magnitude.

- TYLMI: Fair to poor record. Section control is unstable and prone to debris. Poor relationship between flows at TYLMI and TYLMO; likely due to poor precision at low end of rating at TYLMI. Good coverage by flow measurements. Need more rating points at low flows.

Finally, there was a significant gap in the continuous flow data at COUMI as shown in Table 4.

Table 4. 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	2/5/20, 2:45	3/5/20, 14:00	707.25	Gap filled with copied data from TYLMI

[a] Gaps in data reported for the water year (October 1, 2019, through September 30, 2020).

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

To facilitate analyses of hydrologic trends, the gap identified in Table 4 was filled using estimated flow data. The estimate was derived by first importing the continuous flow data from all stations into the AQUARIUS Time-Series software package (AQUARIUS). The approximately 1-month data gap for the COUMI station was filled with data from the TYLMI station, which had a similar hydrograph form and magnitude. Scale adjustments were made as appropriate to produce the final estimate of hydrograph form and magnitude.

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 5.

Table 5. 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	1.76	24.75	112,771	3,239,122
EVAMS	A	0.62	10.07	38,562	1,094,192
MONM	A	1.35	43.96	87,924	3,961,523
MONMN	A	0.41	26.38	24,504	1,636,890
MONMS	A	0.17	4.52	10,950	497,493
TOSMO	A	0.67	16.05	43,785	1,535,351
TOSMI	A	0.42	11.15	26,586	1,083,694
COLM	R	0.77	27.62	47,982	4,517,528
SEIMN	R	0.49	12.48	32,122	1,817,486
SEIMS	R	0.51	8.49	33,685	1,176,883
COUMO	C	0.43	20.55	25,599	1,249,923
COUMI	C	0.12	3.37	6,942	517,356
TYLMO	C	0.58	16.87	41,264	1,646,066
TYLMI	C	0.18	6.08	11,056	577,597

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 will be processed to calculate a suite of 12 indicators for evaluating hydrologic

impacts from urban development. Because many of the indicators are derived using the long-term daily average flow rate, these calculations will be performed in conjunction with the preparation of the trend analyses reports that are described in the *Introduction* section of this document.

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 the 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. Four events were sampled in the first and third quarters of WY2020, respectively, to make up for events that were missed in previous water years due to dry conditions. Only one storm event was sampled in the fourth quarter of WY2020 due to extremely dry conditions. Additional storm events will be sampled in water year 2021 (WY2021) to make up for these missed 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 WY2020 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 WY2020 with the following exceptions:

- October 16, 2019, event; the precipitation depth ranged from 0.13 to 0.17 inch across all stations. This event was targeted despite the marginal forecast in an effort to collect season first flush chemistry.

- November 15, 2019, event; the precipitation depth ranged from 0.19 to 0.23 inch across all stations. Though below the target of 0.25 inch, this event was deemed close enough for inclusion in the final dataset.

- May 21, 2020, event; the antecedent dry period ranged from 6.3 to 9.3 hours for stations in the watersheds for the following creeks: Tosh, Country, Tylers, Monticello, and Evans. There was only a small amount of rain in excess of 0.04 inch in the 12-hour window before the event, so the storm was deemed valid.

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. These plots show that most samples were collected early on the rising limb or peak of the hydrograph.

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 with one exception; the antecedent dry period for the June 18, 2020, event was only 45.8 hours for stations in the watersheds for Tosh Creek and Country Creek. This value was deemed close enough to the goal for inclusion in the final dataset.

Field data collection forms, chain-of-custody records, laboratory reports, and data quality audit forms from the storm event and base flow sampling during WY2020 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, 20 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 or laboratory 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 WY2020:

- 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 2020	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	Storm	10/16/2019	4.6	**0.17**	186.4	4.6	**0.13**	186.7	4.3	**0.16**	186.2	4.5	**0.13**	181.2
1	Base	10/29/2019	–	–	84.9	–	–	84.4	–	–	82.7	–	–	81.4
1	Storm	11/15/2019	2.6	**0.20**	68.5	2	**0.19**	68.5	1.8	**0.23**	68.4	7.0	**0.23**	68.3
1	Storm	12/11/2019	28.8	0.54	15.2	14.3	0.34	14.9	28.8	0.49	14.2	13.8	0.33	12.9
1	Storm	12/19/2019	51.3	5.04	10.8	54.7	4.87	11.8	50.3	5.37	10.9	50.3	4.42	11
2	Storm	1/10/2020	20.8	0.46	18.4	18.8	0.42	18.4	17.9	0.44	18.1	38.4	1.42	21.8
2	Storm	1/23/2020	53.1	1.41	15.7	26.7	0.99	10.3	77.1	2	10.7	78.8	1.75	11.2
2	Storm	2/5/2020	69.8	4.61	33.8	70.3	4.55	34.6	73.3	5.33	33.8	69.3	5.05	30.8
2	Base	2/20/2020	–	–	88.7	–	–	89.4	–	–	91.5	–	–	89.6
3	Storm	4/22/2020	15.9	0.60	92.1	27.2	1.08	95.2	27.5	1.12	258	29.1	1.19	93.9
3	Storm	5/21/2020	19.5	0.71	**9.3**	15.3	1.01	**6.3**	15.7	1.27	**8.9**	18.3	0.78	86.8
3	Storm	5/30/2020	27.7	1.45	115.8	28.1	1.5	117.7	27.9	1.49	114.4	27.2	1.45	110.6
3	Storm	6/9/2020	11.8	0.26	38.2	12.4	0.29	40.9	12.1	0.32	28.8	20.0	0.41	26.0
3	Base	6/18/2020	–	–	**45.8**	–	–	69.7	–	–	48.2	–	–	52.4
4	Base	9/8/2020	–	–	410.7	–	–	412.2	–	–	196.3	–	–	196.3
4	Storm	9/23/2020	14.9	0.82	20.6	14.7	0.85	23.4	17.3	0.89	23.6	14.7	0.88	22.3

[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.

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**
10/29/2019	MONMS	TSS, turbidity	Field duplicate exceedance	J
11/15/2019	COLM	Turbidity, total nitrogen, fecal coliform bacteria	Field duplicate exceedance	J
12/19/2019	COLM	Fecal coliform bacteria	Laboratory duplicate exceedance	J
1/10/2020	SEIMS	Fecal coliform bacteria	Laboratory duplicate exceedance	J
4/22/2020	TOSMI	Fecal coliform bacteria	Field duplicate exceedance	J
5/30/2020	ALL	Fecal coliform bacteria	Holding time exceedance	J
9/8/2020	COUMI	Fecal coliform bacteria	Field duplicate exceedance	J

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

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).

As documented in the quality assurance review memorandum (Appendix B), the continuous temperate and conductivity data at each station was rated as either "fair" or "good" with the following exceptions:

- COUMO: Poor record for conductivity.
- SEIMN: Fair to poor record for conductivity.

In addition, the following substantial gaps in the continuous conductivity data were noted:

- No data are available for the EVALSS station over the period from March 4, 2020, through March 24, 2019.
- No data are available for the MONM station over the period from December 22, 2019, through January 30, 2020.

- No data are available for the MONMS station over the period from June 25, 2020, through September 10, 2020.
- No data are available for the COUMO station over the period from December 10, 2019, through March 24, 2020.
- No data are available for the TYLMO station over the period from January 21, 2020, through April 23, 2020.

PHYSICAL HABITAT MONITORING

Physical habitat monitoring for WY2020 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 7/15/2020
- EVAMS 8/3/2020
- MONT-1 9/2/2020
- MONT-2 8/3/2020
- MONT-3 9/1/2020
- MONT-4 7/22/2020
- MONT-5 7/9/2020
- TOSH-1 7/21/2020
- TOSH-2 7/15/2020
- TOSH-3 8/12/2020
- TOSH-4 9/3/2020
- COLIN-1 7/8/2020
- SIDL-1 7/29/2020
- SIDL-2 7/13/2020
- SIDL-3 8/6/2020

- CTRY-1 8/5/2020
- CTRY-2 7/17/2020
- TYLR-1 7/23/2020
- TYLR-2 8/13/2020

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 WY2020 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 7/15/2020
- EVAMS 8/3/2020
- MONT-1 9/2/2020
- MONT-2 8/3/2020
- MONT-3 9/1/2020
- MONT-4 7/22/2020
- MONT-5 7/9/2020
- TOSH-1 7/7/2020
- TOSH-2 7/15/2020
- TOSH-3 8/12/2020
- TOSH-4 9/3/2020
- COLIN-1 7/8/2020
- SIDL-1 7/29/2020
- SIDL-2 7/13/2020
- SIDL-3 8/6/2020
- CTRY-1 8/5/2020
- CTRY-2 7/17/2020
- TYLR-1 7/23/2020
- TYLR-2 8/13/2020

Field data laboratory reports and data quality audit forms from sediment quality sampling in WY2020 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. Based on this review, one value (total organic carbon for the SIDL-3 station) was qualified as an estimate; and no values were 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	4.7	36	130
EVAMS	A	8.8	20	110
MONT-1	A	3.3	30	210
MONT-2	A	3.7	32	440
MONT-3	A	1.9	47	780
MONT-4	A	3.7	37	140
MONT-5	A	4.7	27	280
TOSH-1	A	1.2	23	270
TOSH-2	A	0.78	22	270
TOSH-3	A	4.6	27	360
TOSH-4	A	2.6	33	690
COLIN-1	R	0.91	11	65
SIDL-1	R	4.4	23	79
SIDL-2	R	2.3	27	62
SIDL-3	R	2.4	19	76
CTRY-1	C	3	38	1100
CTRY-2	C	3.5	19	72
TYLR-1	C	2.1	51	450
TYLR-2	C	6.6	83	930

[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

BIOLOGICAL MONITORING

Biological monitoring for WY2020 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 7/15/2020
- EVAMS 8/3/2020
- MONT-1 9/2/2020
- MONT-2 8/3/2020
- MONT-3 9/1/2020
- MONT-4 7/22/2020
- MONT-5 7/9/2020
- TOSH-1 7/15/2020
- TOSH-2 7/15/2020
- TOSH-3 8/12/2020
- TOSH-4 9/3/2020
- COLIN-1 7/8/2020
- SIDL-1 7/29/2020
- SIDL-2 7/13/2020
- SIDL-3 8/6/2020
- CTRY-1 8/5/2020
- CTRY-2 7/17/2020
- TYLR-1 7/23/2020
- TYLR-2 8/13/2020

The laboratory report for biological monitoring in WY2020 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 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	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.061	0.064	0.088	0.025	0.026	0.063	0.011 U	0.042	0.011 U	0.030	0.011 U	0.011 U	0.077	0.476
EVAMS	A	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
MONT-1	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-2	A	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
MONT-3	A	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
MONT-4	A	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
MONT-5	A	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
TOSH-1	A	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.031	0.034	0.047	0.023	0.013	0.036	0.006 U	0.062	0.006 U	0.023	0.006 U	0.035	0.062	0.366
TOSH-2	A	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.034	0.038	0.051	0.024	0.017	0.040	0.006 U	0.080	0.006 U	0.026	0.006 U	0.049	0.075	0.434
TOSH-3	A	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.030	0.041	0.058	0.035	0.017	0.040	0.008 U	0.082	0.008 U	0.034	0.008 U	0.039	0.068	0.444
TOSH-4	A	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.008	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.008
COLIN-1	R	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
SIDL-1	R	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.017	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	0.017	0.034
SIDL-2	R	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
SIDL-3	R	0.008 U	0.008 U	0.008 U	0.011	0.017	0.044	0.045	0.037	0.019	0.012	0.043	0.008 U	0.069	0.008 U	0.021	0.008 U	0.065	0.087	0.470
CTRY-1	C	0.007 U	0.007 U	0.007 U	0.007 U	0.011	0.064	0.083	0.100	0.063	0.030	0.079	0.013	0.150	0.007 U	0.063	0.007 U	0.067	0.130	0.853
CTRY-2	C	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	0.008
TYLR-1	C	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.016	0.021	0.022	0.015	0.008	0.017	0.006 U	0.022	0.006 U	0.014	0.006 U	0.006	0.024	0.166
TYLR-2	C	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.025	0.035	0.037	0.020	0.012 U	0.025	0.012 U	0.050	0.012 U	0.022	0.012 U	0.023	0.039	0.276

[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	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U
EVAMS	A	0.130 U	0.130 U	0.130 U	0.066 U	0.130 U	0.130 U
MONT-1	A	0.210 U	0.210 U	0.210 U	0.041 U	0.210 U	0.210 U
MONT-2	A	0.230 U	0.230 U	0.230 U	0.047 U	0.230 U	0.230 U
MONT-3	A	0.190 U	0.190 U	0.190 U	0.037 U	0.190 U	0.190 U
MONT-4	A	0.220 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U
MONT-5	A	0.240 U	0.240 U	0.240 U	0.048 U	0.240 U	0.240 U
TOSH-1	A	0.150 U	0.150 U	0.150 U	0.030 U	0.150 U	0.150 U
TOSH-2	A	0.150 U	0.150 U	0.150 U	0.031 U	0.150 U	0.150 U
TOSH-3	A	0.250 U	0.210 U	0.210 U	0.210 U	0.210 U	0.210 U
TOSH-4	A	0.140 U	0.140 U	0.140 U	0.070 U	0.140 U	0.140 U
COLIN-1	R	0.140 U	0.140 U	0.140 U	0.029 U	0.140 U	0.140 U
SIDL-1	R	0.240 U	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U
SIDL-2	R	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U
SIDL-3	R	0.200 U	0.200 U	0.200 U	0.041 U	0.200 U	0.200 U
CTRY-1	C	0.180 U	0.180 U	0.180 U	0.180 U	0.180 U	0.180 U
CTRY-2	C	0.150 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U
TYLR-1	C	0.130 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
TYLR-2	C	0.160 U	0.160 U	0.160 U	0.160 U	0.160 U	0.160 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.

Table 11. Computed Biological Indicators for Evaluating Stream Health.

Station	Watershed Type	Overall Condition	Benthic Index of Biotic Integrity[a]	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	Very Poor	16.1	17	1	3	2	7	4	2	73.6%	6.6%	26.4%
EVAMS	A	Fair	59.9	31	4	7	6	13	9	2	37.1%	32.9%	18.6%
MONT-1	A	Fair	51.6	37	4	5	6	15	6	1	28.4%	10.1%	16.4%
MONT-2	A	Poor	28.6	33	3	4	1	7	3	0	40.8%	7.5%	11.7%
MONT-3	A	Very Poor	14.5	25	1	1	1	4	1	0	53.4%	14.8%	28.4%
MONT-4	A	Very Poor	18	29	1	2	2	4	2	0	58.5%	10.2%	12.2%
MONT-5	A	Poor	24.2	30	2	3	4	9	5	0	52.1%	4.3%	25.7%
TOSH-1	A	Poor	36.1	35	2	4	5	12	6	0	49.8%	7.0%	15.2%
TOSH-2	A	Very Poor	19.1	26	3	3	3	8	5	0	57.8%	7.2%	41.2%
TOSH-3	A	Very Poor	15.4	24	2	2	2	5	2	0	45.5%	2.2%	24.2%
TOSH-4	A	Very Poor	14.7	25	2	3	3	7	3	0	66.5%	13.0%	50.9%
COLIN-1	R	Fair	48.6	32	4	5	6	12	6	2	44.3%	11.4%	8.9%
SIDL-1	R	Fair	44.5	36	6	3	4	13	3	3	41.4%	6.5%	6.8%
SIDL-2	R	Fair	44.5	32	4	5	6	12	7	4	62.9%	29.1%	57.8%
SIDL-3	R	Fair	58.7	35	4	5	6	14	8	2	27.0%	24.6%	20.6%
CTRY-1	C	Very Poor	3.9	15	1	1	1	2	2	0	63.5%	5.8%	50.0%
CTRY-2	C	Fair	18.6	18	0	1	0	4	1	0	71.8%	18.9%	1.7%
TYL-1	C	Very Poor	13.3	18	0	2	0	4	4	0	80.6%	0.2%	2.6%
TYL-2	C	Very Poor	42.5	47	3	5	5	7	6	0	43.0%	11.6%	22.7%

[a] Benthic Index of Biotic Integrity scores are on a scale of 0 to 100.

A = Application

R = Reference

C = Control

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APPENDIX A

Line Plots Showing Continuous Flow Data by Watershed

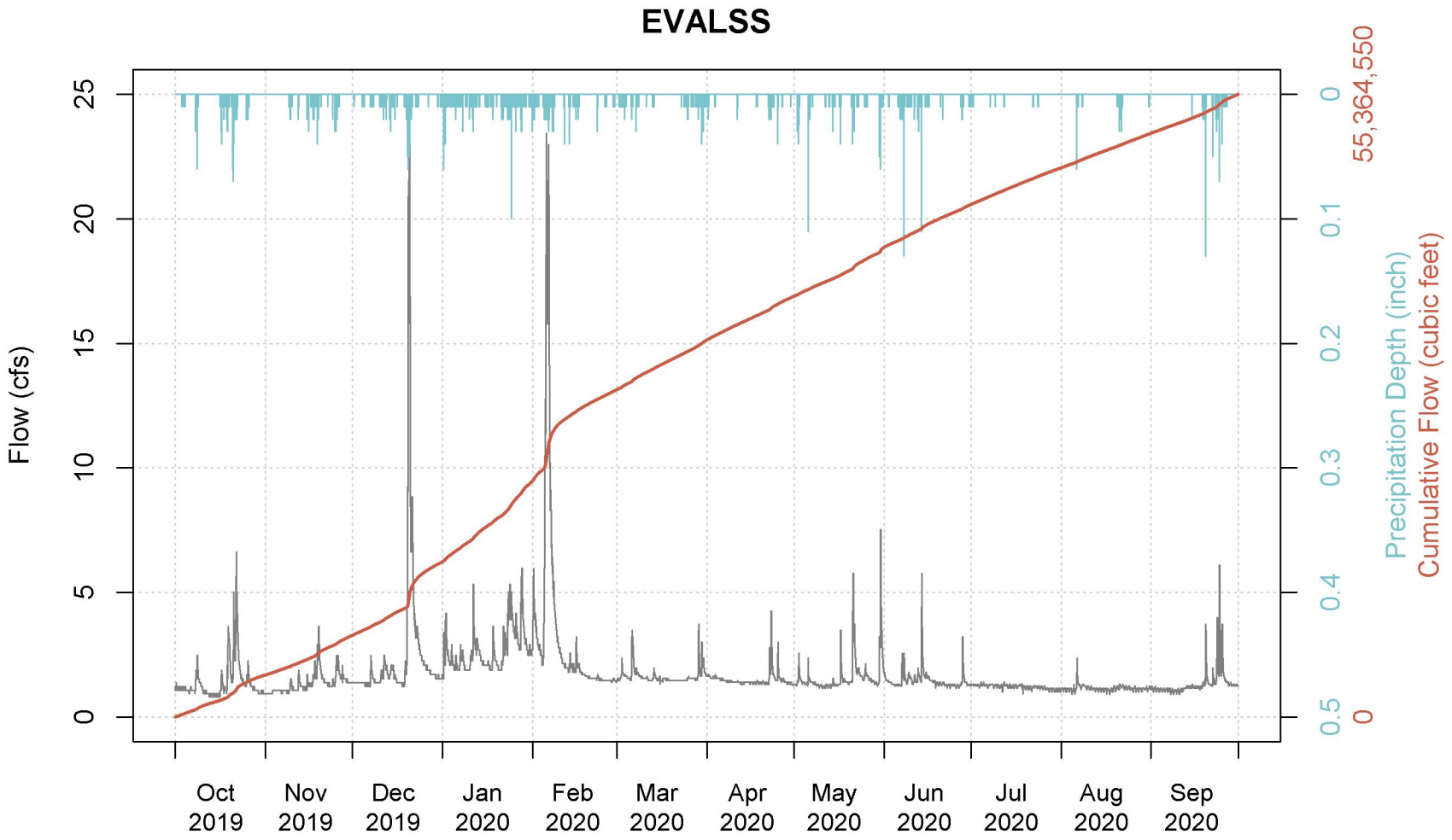

Figure A-1. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the EVALSS Station.

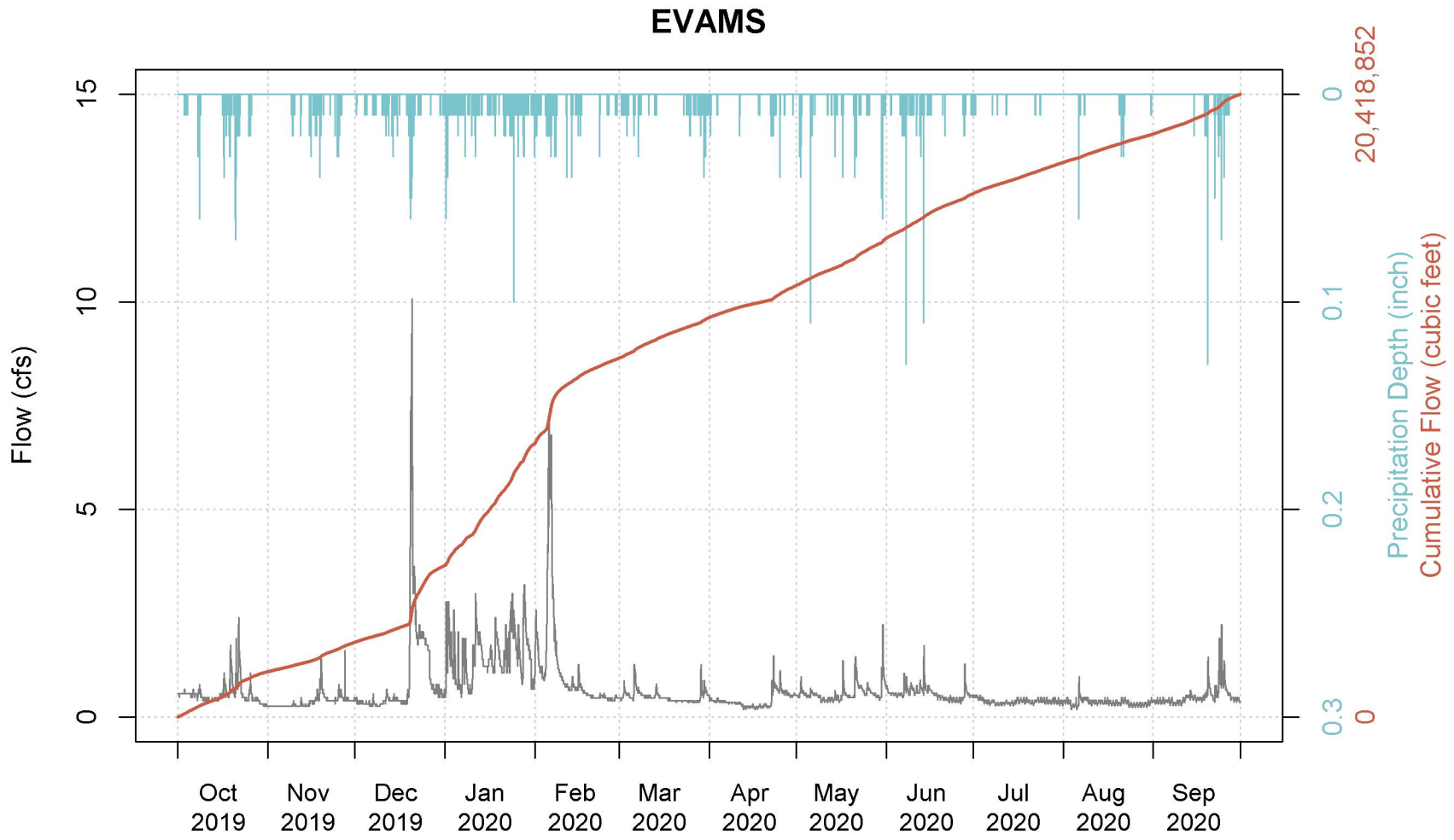

Figure A-2. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the EVAMS Station.

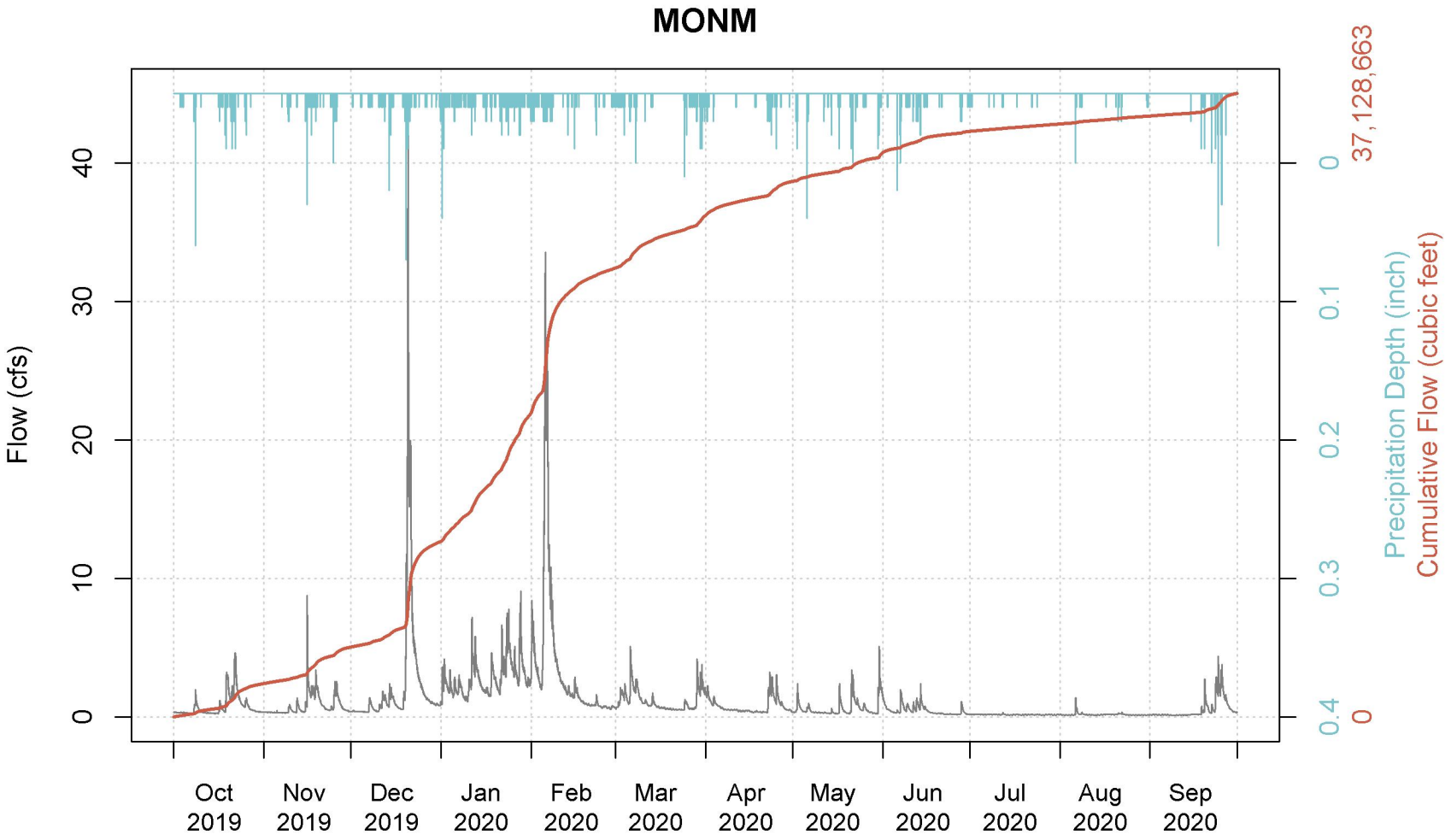

Figure A-3. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONM Station.

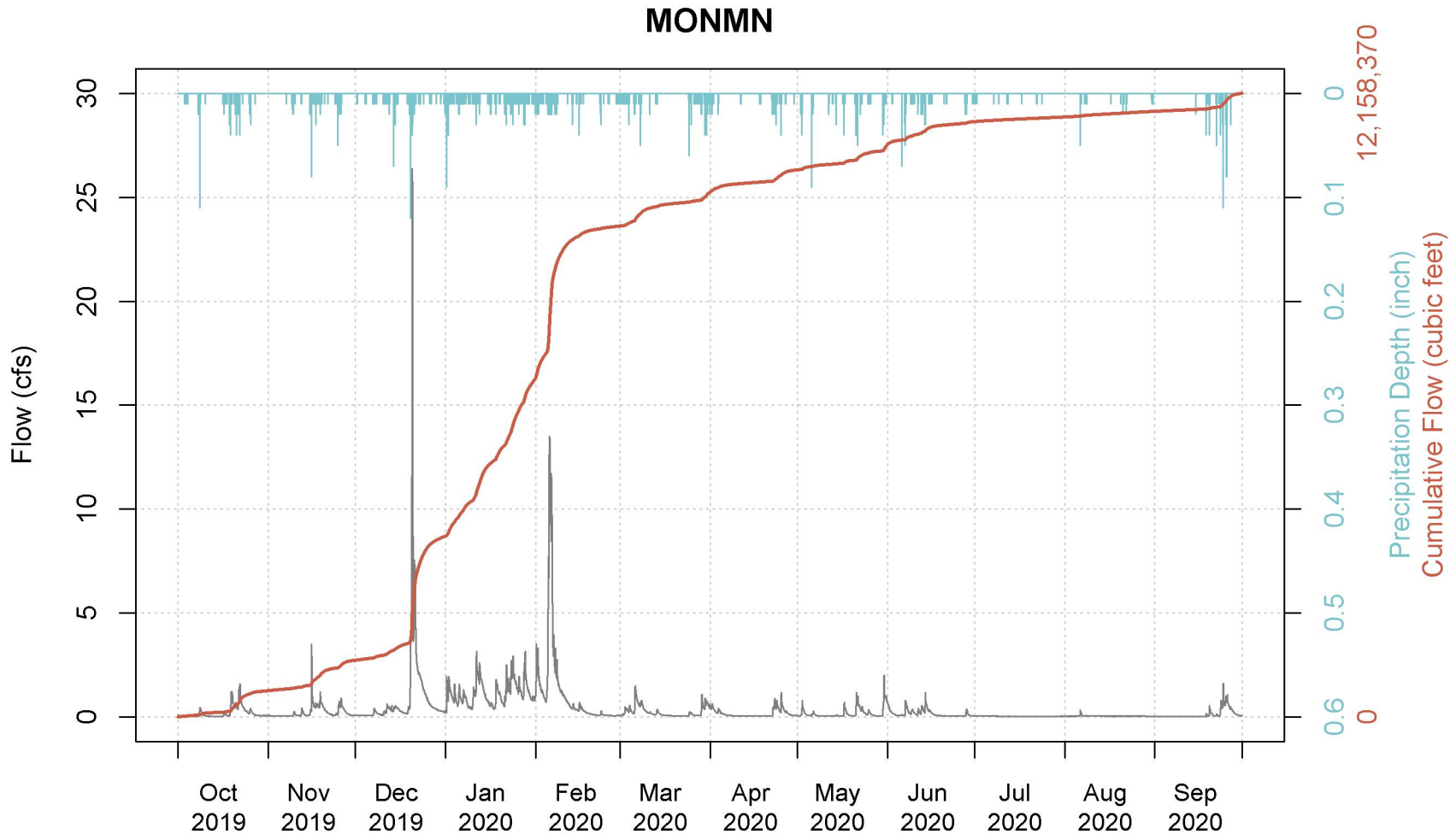

Figure A-4. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONMN Station.

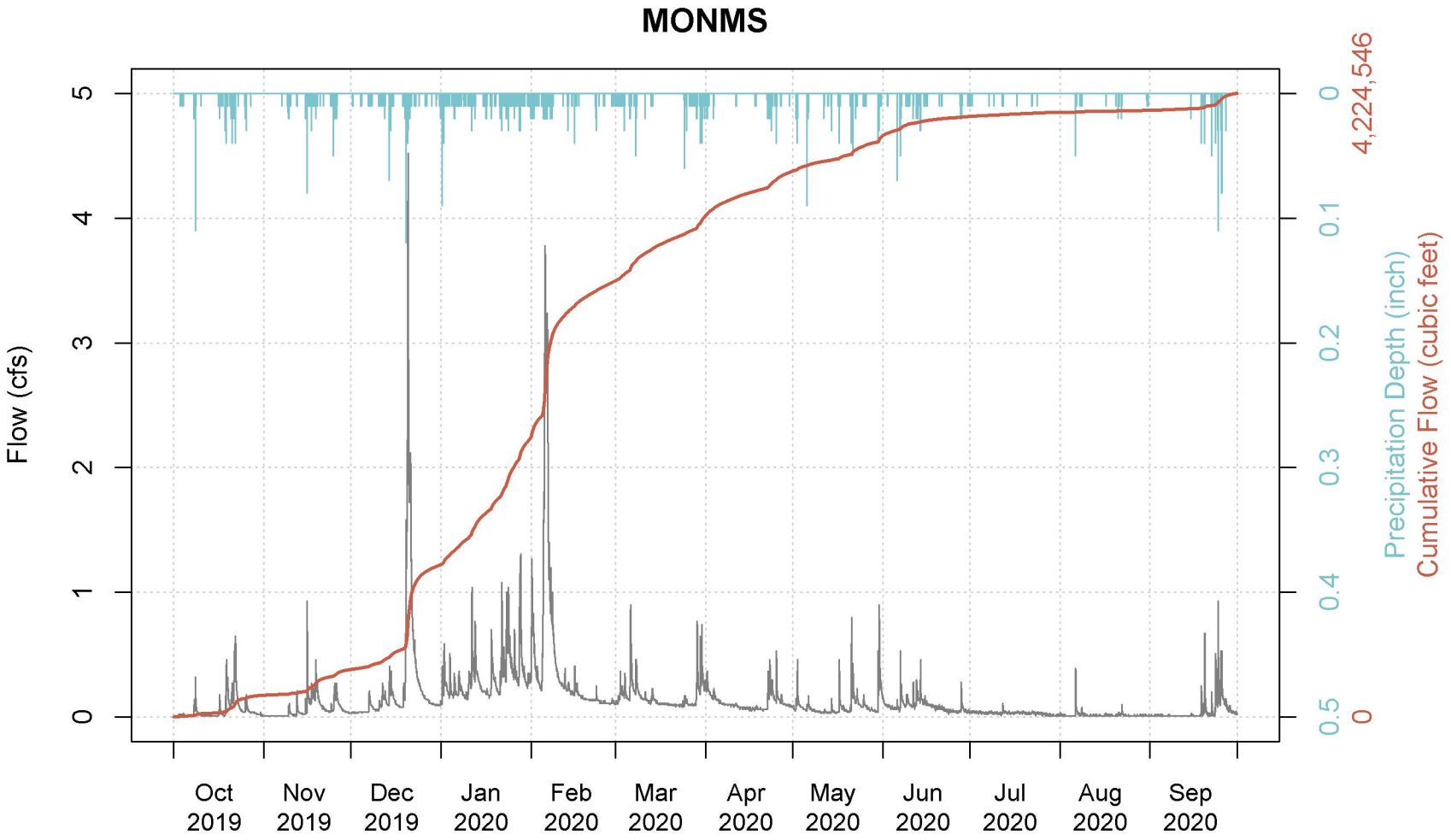

Figure A-5. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONMS Station.

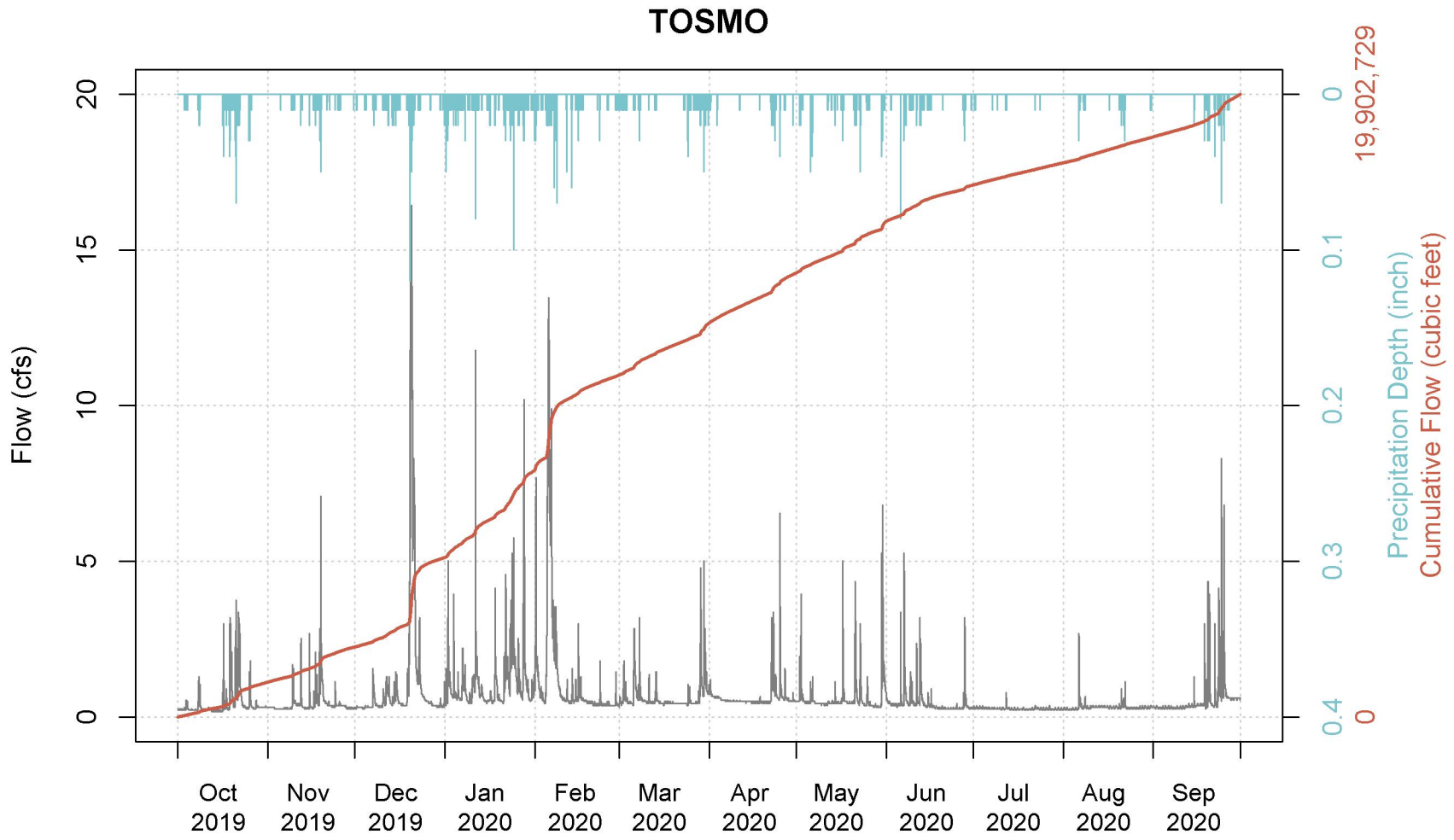

Figure A-6. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TOSMO Station.

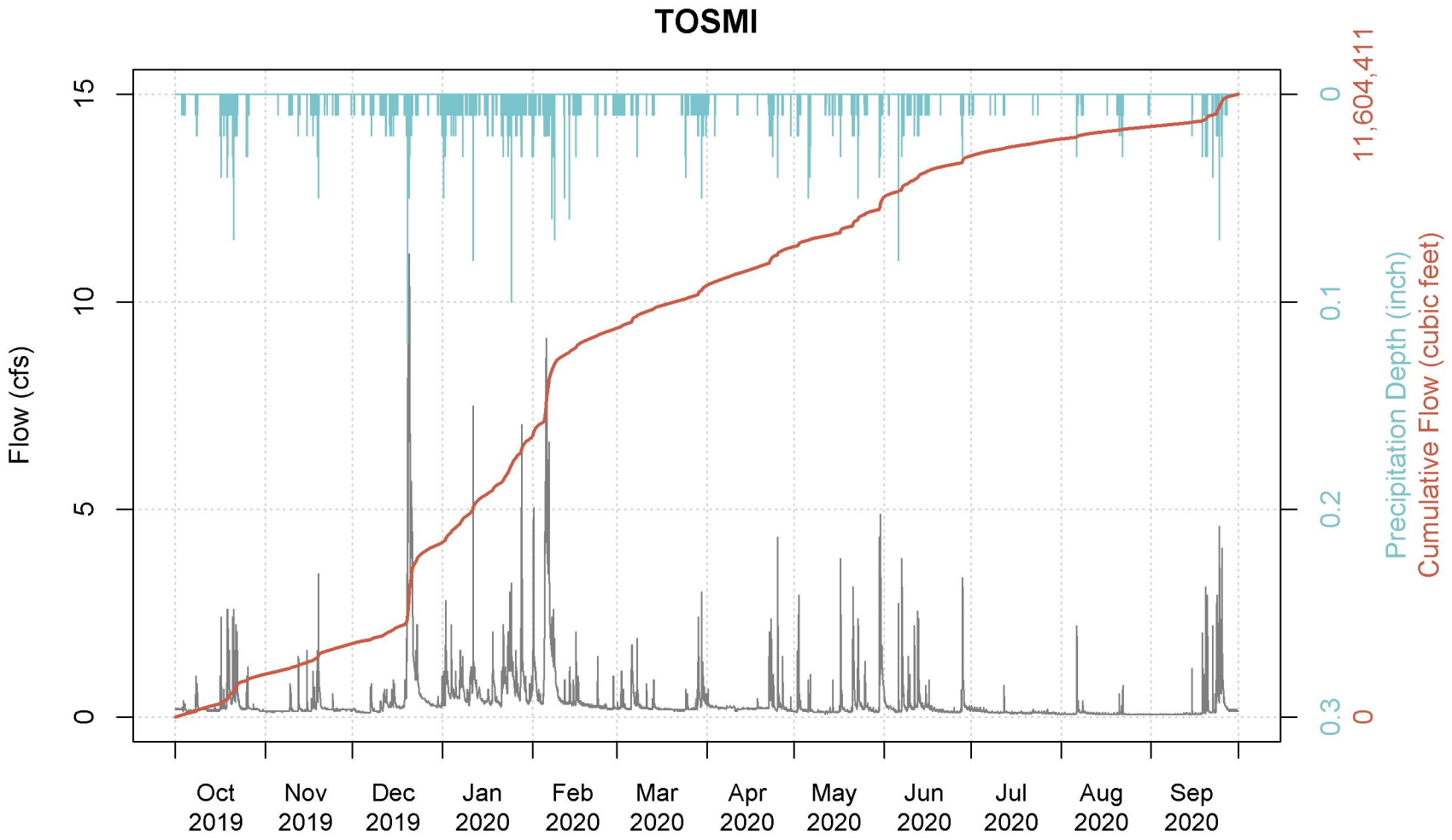

Figure A-7. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TOSMI Station.

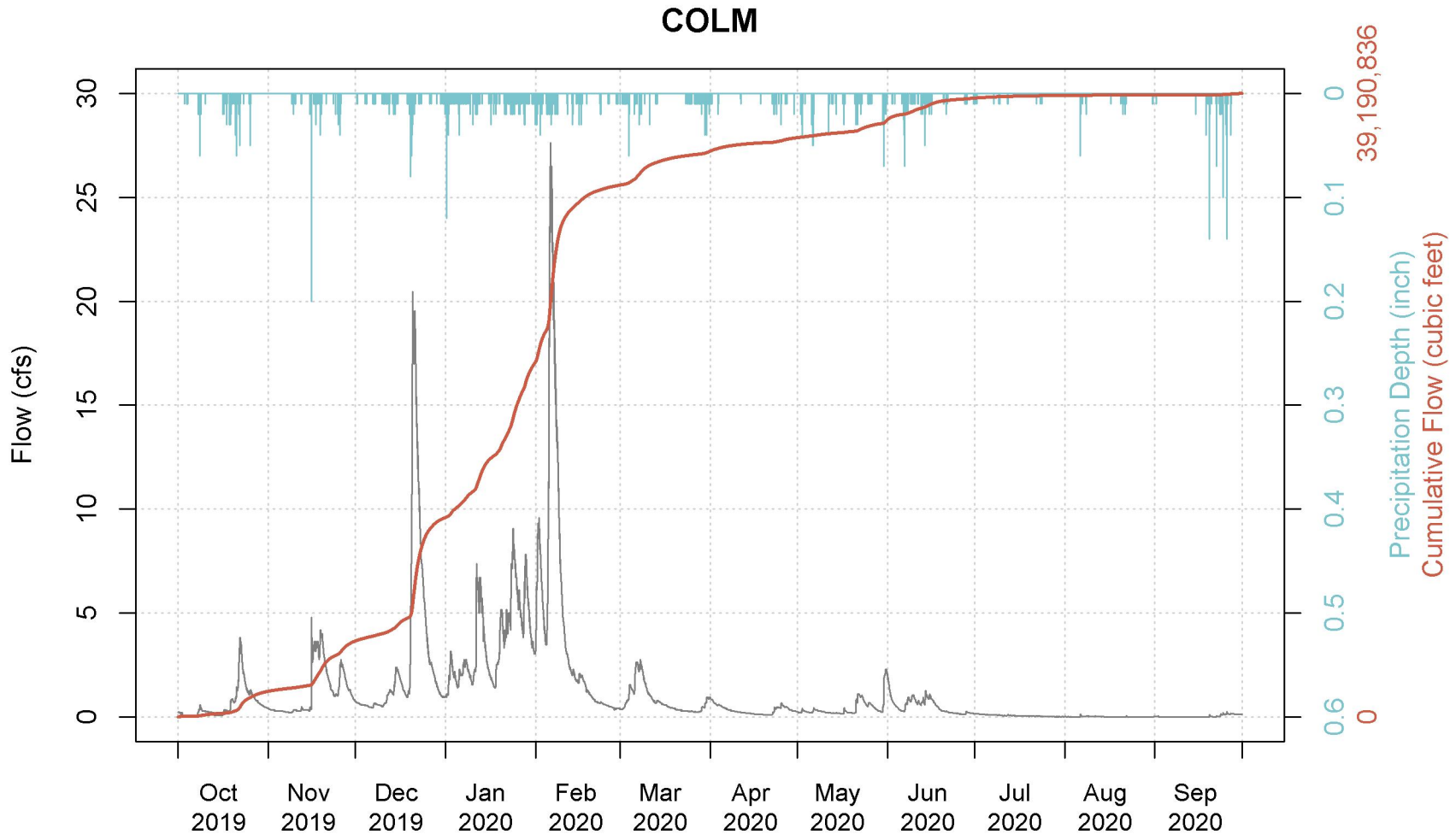

Figure A-8. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COLM Station.

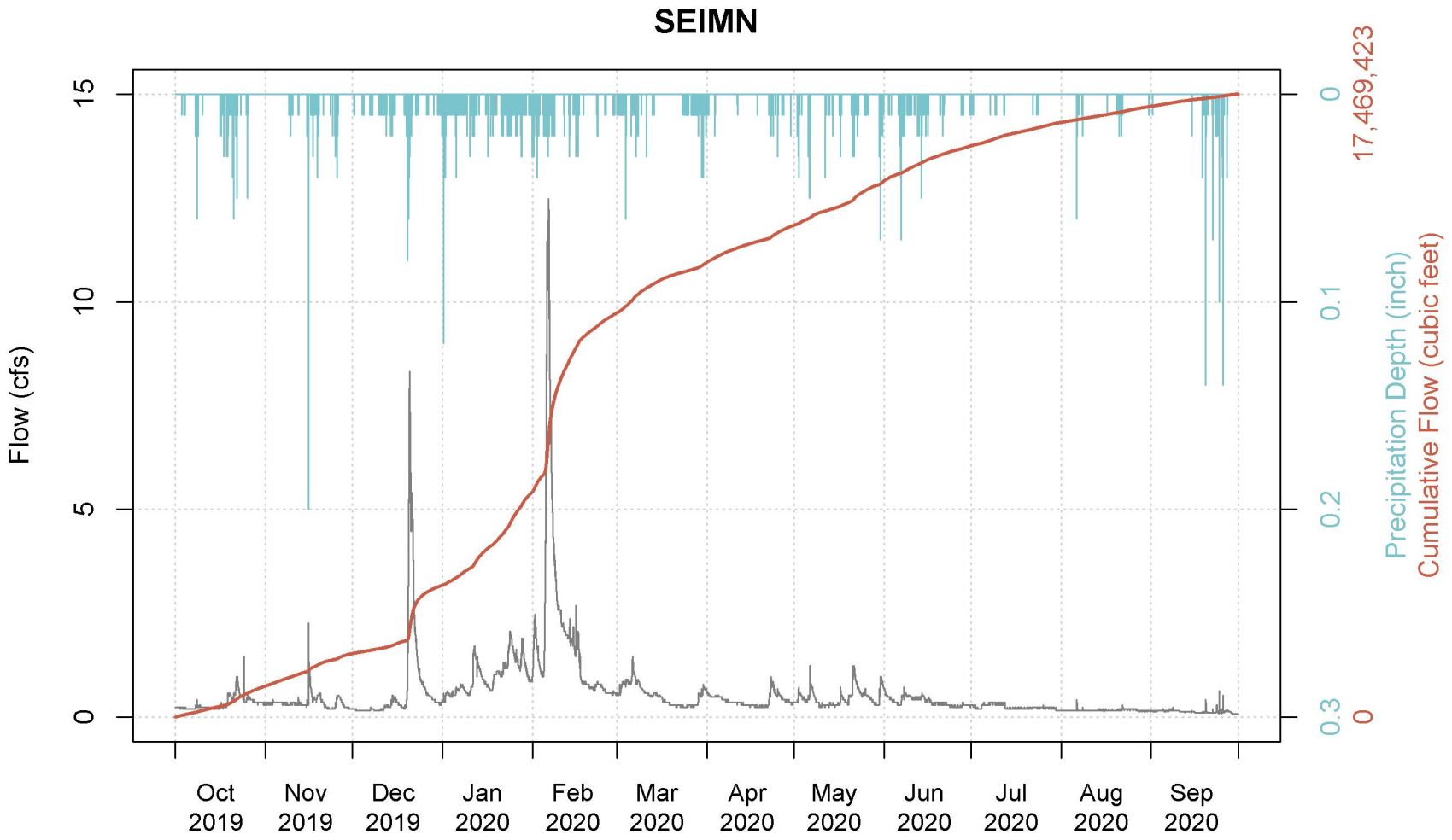

Figure A-9. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the SEIMN Station.

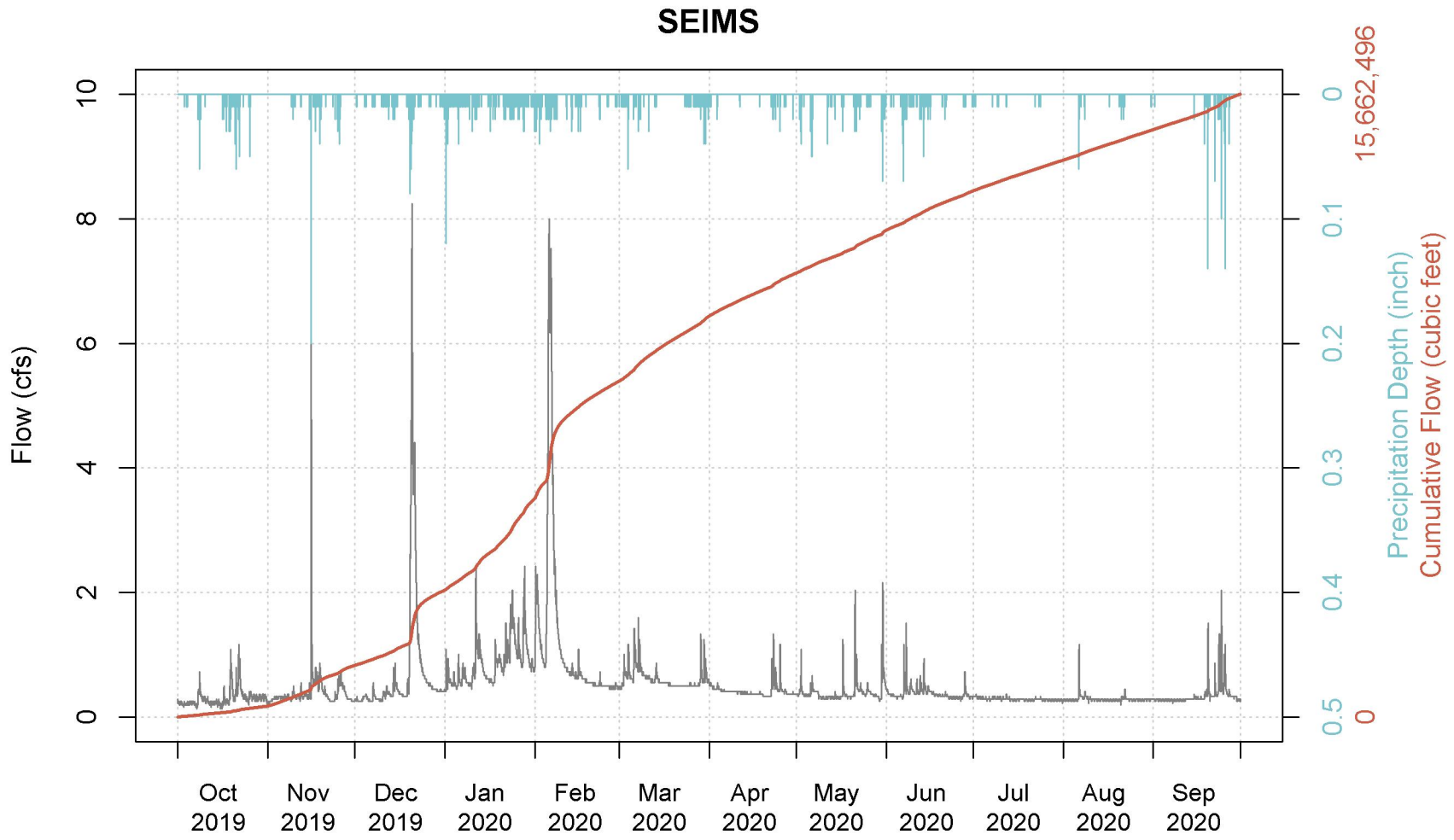

Figure A-10. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the SEIMS Station.

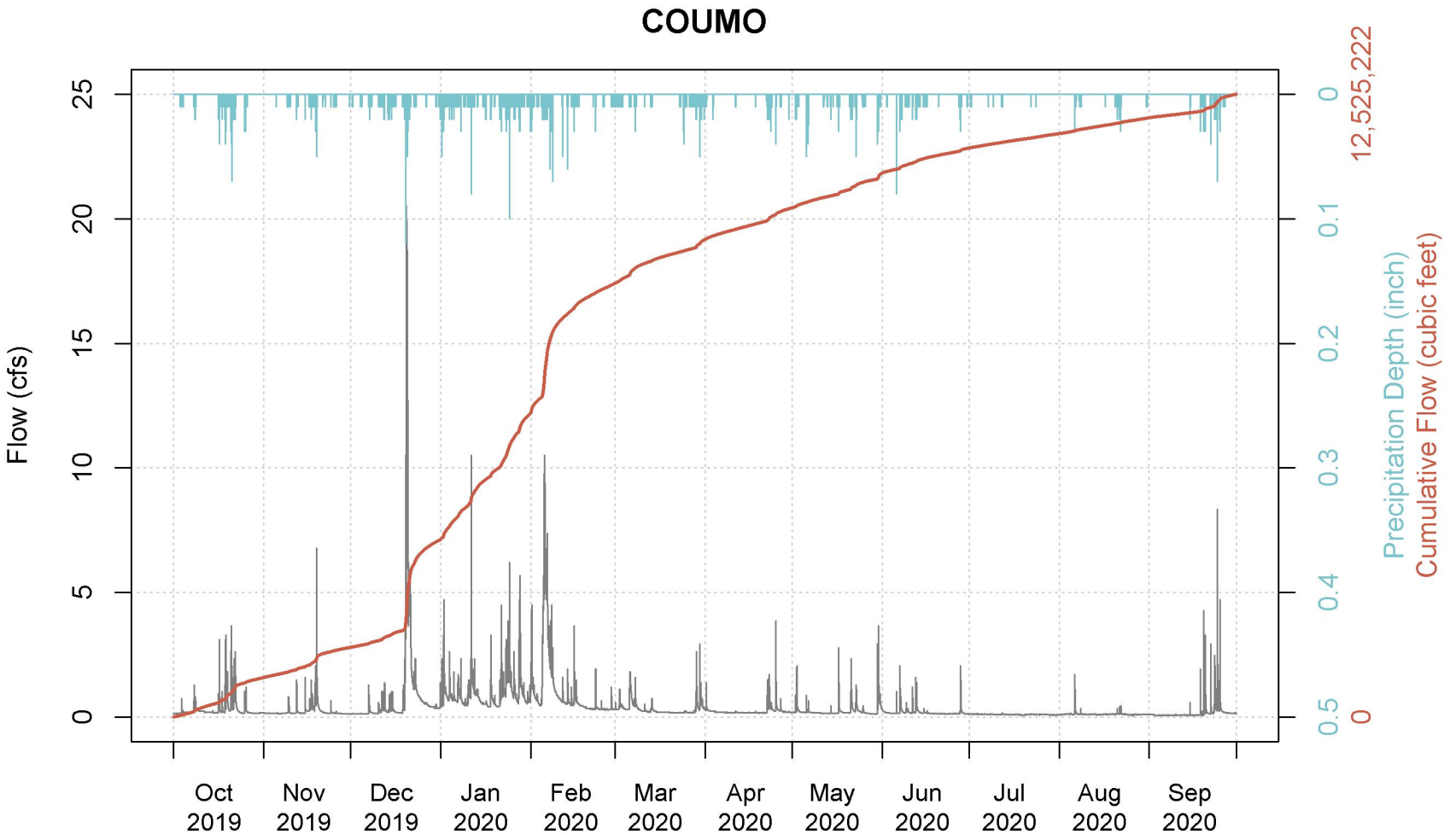

Figure A-11. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COUMO Station.

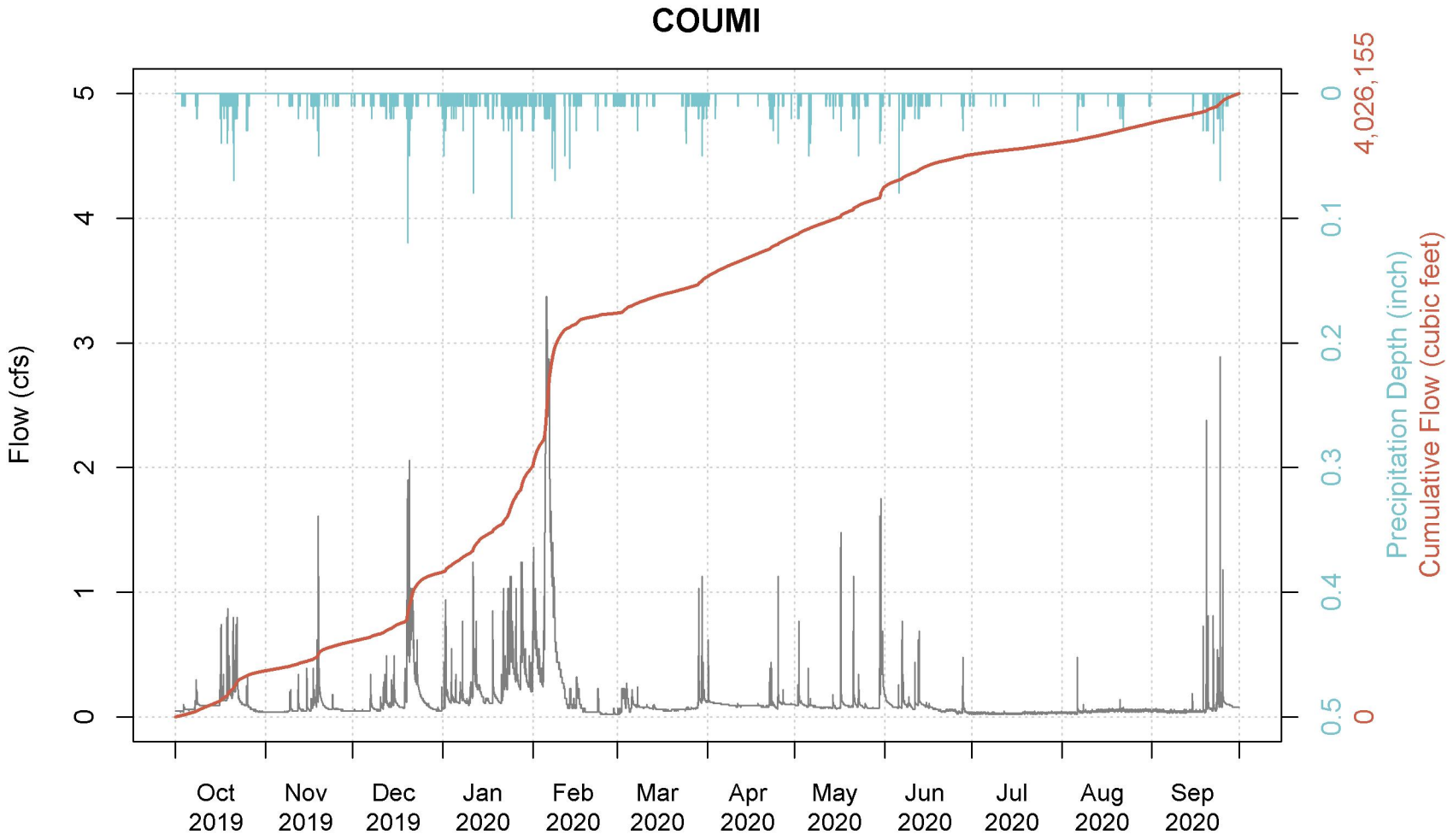

Figure A-12. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COUMI Station.

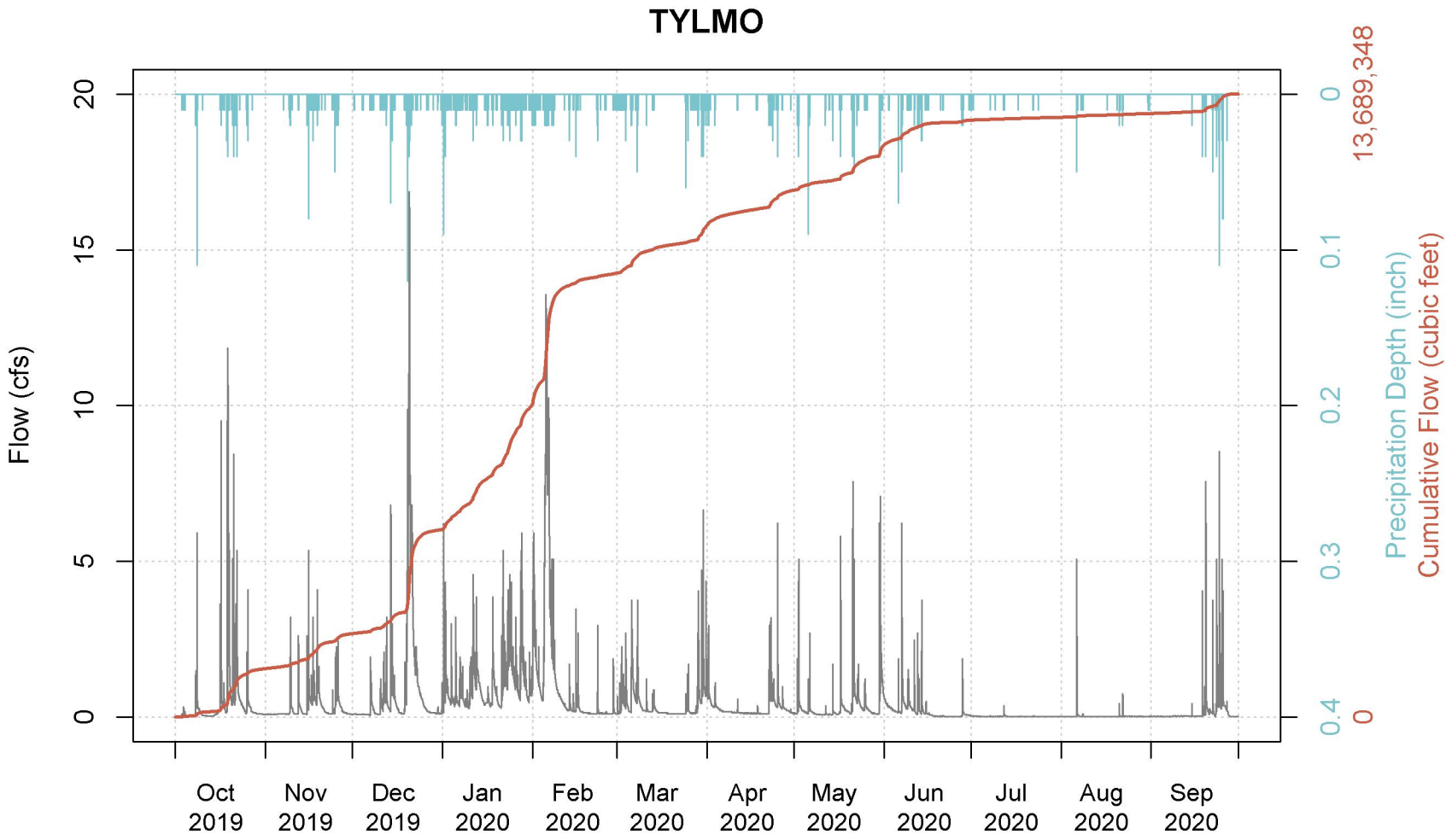

Figure A-13. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TYLMO Station.

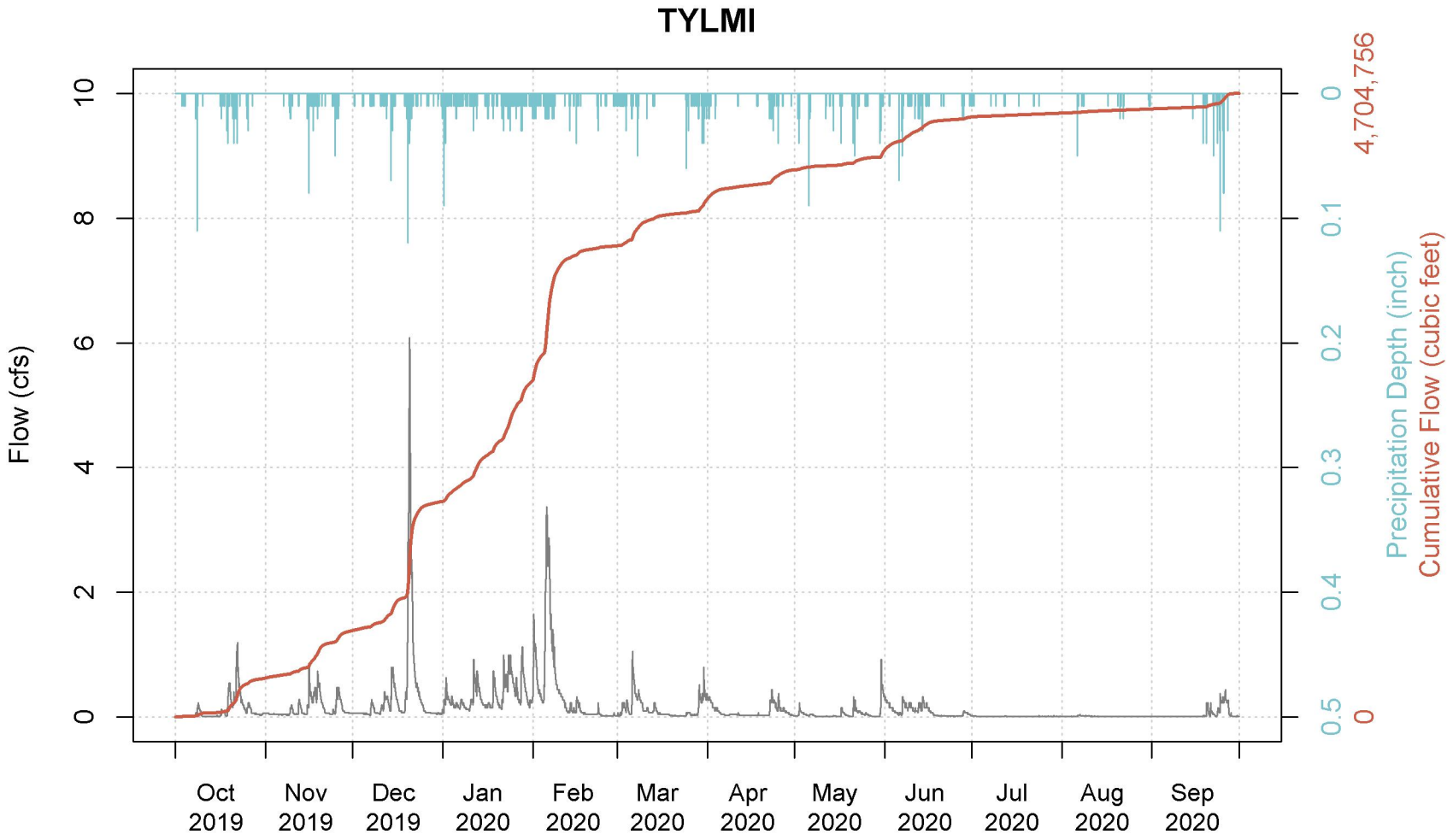

Figure A-14. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TYLMI Station.

APPENDIX B

Data Quality Assurance Review Memorandum for Hydrologic Monitoring

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TECHNICAL MEMORANDUM

March 15, 2021

TO: Dylan Ahearn, 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 begins at the 2020 water year (10/1/2019) and ends at end of the 2020 calendar year (12/31/2020).

Stream discharge was determined at 14 sites for the study. Water temperature was recorded at 14 sites and conductivity loggers were deployed at eight. Precipitation, air temperature, and barometric pressure were recorded at three sites. Instruments used to collect these parameters are listed in Table 1. See Figure 1 in Appendix A for station locations.

Table 1. Instruments used to measure continuous rainfall, water level (pressure), conductivity, and water temperature for the RPWS from October 1, 2019 to December 31, 2020.

Parameter	Manufacturer	Model	Link
Rainfall	Hydrological Services America	TB6	https://www.hydrologicalusa.com/products/meteorology/tipping-bucket-rain-gauges/tb6-tipping-bucket-rain-gauge/
Pressure	Campbell Scientific	CS451	https://www.campbellsci.com/cs451
Pressure and temperature	Onset	U20	https://www.onsetcomp.com/products/data-loggers/u20-001-04/
Temperature	Campbell Scientific	109	https://www.campbellsci.com/109
Temperature	Onset	U22	https://www.onsetcomp.com/products/data-loggers/u22-001/
Temperature and conductivity	Onset	U24	https://www.onsetcomp.com/products/data-loggers/u24-001/

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 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 2 below for a summary of data quality and gaps in specific conductivity data.

Table 2. Notes on specific conductivity records for the RPWS from October 1, 2019 to December 31, 2020.

Site Code	Data Rated	Gaps*	Notes*
COUMO	**Poor** - large offsets used to correct instrument readings to YSI observations. Several instances of U24 logger getting partially buried.	▪ 12/10/2019 @ 13:00 - 3/24/2020 @ 17:00 - in hourly due to logger launch error ▪ 3/14/2020 @ 17:00 - 3/24/2020 @ 12:00 - U24 battery failure ▪ 12/21/2020 @ 00:00 - 1/1/2021 @ 00:00 - U24 logger completely buried	▪ Lots of spikes throughout record. Occurred in records from different U24 loggers at this site. ▪ Baseflow conductivity after 11/16/2020 seems too low relative to previous years and TOSMO
EVALSS	**Fair/Good** - moderate offsets used to correct instrument readings to YSI observations but consistent. Not much noise in instrument readings.	▪ 3/4/2020 @ 12:30 - 3/24/2020 @ 14:30 - U24 battery failure	▪ 12/9/2019 @ 16:00 - 3/4/2020 @ 12:15 - big offsets (>50 us/cm) in this period
EVAMS	**Good** - good agreement between instrument readings and YSI observations. A few periods with noisy instrument readings.	none	▪ 3/15/2020 @ 17:30 - 3/24/2020 @ 13:00 - lots of oscillations in this period.
MONMO	**Good** - good agreement between instrument readings and YSI observations. A few periods with noisy instrument readings.	▪ 12/22/2019 @ 22:45 - 1/30/2020 @ 15:00 - U24 logger pushed out of water by high flow. Only partially submerged during this period.	
MONMS	**Fair/Good** - moderate offsets used to correct instrument readings to YSI observations but consistent. Not much noise in instrument readings.	▪ 6/25/2020 @ 15:30 - 9/10/2020 @ 17:15 - logger failure. Onset unable to recover data.	▪ 12/22/2020 @ 02:15 - 1/1/2020 @ 00:00 - used large offset during this period to match YSI observations.

Site Code	Data Rated	Gaps*	Notes*
SEIMN	**Poor/Fair** - Mostly good agreement between YSI observations and instrument readings but odd-looking stretches in record that don't seem inversely correlated with flow (as you'd expect in a forested catchment). Logger often buried due in gravel after storm events.	none	▪ 10/1/2019 @ 00:00 - 1/4/2020 @ 09:45 - used large offset during this period to match YSI observations; sensor partially buried ▪ 2/3/2020 @ 16:00 - 3/7/2020 @ 13:30 - record odd in this period. Sensor likely buried during early February storms. ▪ 3/7/2020 - 12/23/2020 - record good in this period. ▪ 12/23/2020 @ 00:00 - odd looking record. Poor agreement between YSI and U24 instrument reading on 1/22/2021. ▪ Removed spikes from salt tracer injections from CAO study.
SEIMS	**Good** - good agreement between instrument readings and YSI observations. Very little noise in record.	none	▪ 5/4/2020 @ 14:30 - large spike, left in record. ▪ Removed spikes from salt tracer injections from CAO study.
TOSMO	**Good** - good agreement between instrument readings and YSI observations. Very little noise in record.	none	▪ Three large spikes in mid-October 2019. First two associated with small WL increases, third at start of storm event. Left spikes in.
TYLMO	**Good** - generally good agreement between instrument readings and YSI observations. Record mostly clean with little noise except where noted.	▪ 1/21/2020 @ 22:45 - 4/23/2020 @ 15:45 - U24 battery failure ▪ 11/15/2020 @ 23:00 - 1/1/2021 @ 00:00 - so much noise in record. Some of it might be salvageable but will take some work. May just be easier to do correlation with another site.	▪ Didn't shift to 10/21/2019 YSI observation - during storm and rapidly changing ▪ 1/13/2020 @ 15:15 - 1/21/2020 22:30 - data questionable, some unexplained conductivity peaks. May be real, may be due to low battery. I've noticed these U24s will occasionally give bad readings before their batteries die. ▪ Data from 4/23/2020 to 11/15/2020 good.

* All times listed are in Pacific Daylight Savings Time (GMT - 07:00)

Water Temperature

Continuous water temperature was generally measured with a Campbell Scientific 109UL temperature probe. Alternative instruments were used in situations where the primary 109UL malfunctioned, was buried, or went dry. 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. Table 3 summarizes information about water temperature data quality and data gaps.

Table 3. Notes on water temperature records for the RPWS from October 1, 2019 to December 31, 2020.

Site Code	Data Rated	Gaps*	Notes*
COLM	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	▪ 9/1/2020 @ 00:05 - 9/19/2020 @ 19:55 - channel dry	
COUMI	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	
COUMO	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	Some abrupt temperature changes that I believe to actual changes due to water pulses rather than sensor issues. Left in record.
EVALSS	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	Disregarded a YSI observation on 12/28/2020 - three degrees off of instrument reading. No other observations this far off and EVALSS IR similar to EVAMS IR. Probably a transcription error.
EVAMS	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	Some instances where 109UL temp sensor got a little shallow but didn't seem to have impact temperature record.
MONMN	**Fair** - YSI observations usually a bit warmer than instrument readings (~0.2°C)	▪ 2/19/2020 @ 12:20 - 2/23/2020 @ 12:20 - water temperature dropped abruptly, reaching -4.0°C. Did not correspond with a change in water level and did not see similar drop downstream at MONMO. Believe that this was due to a sensor malfunction.	Shifted water temperature record to field observations.

Site Code	Data Rated	Gaps*	Notes*
MONMO	**Good/fair** - records from U22 and CS451 good; records from U24 had to be shifted by ~1.2°C to match YSI observations.	▪ 2/6/2020 @ 14:40 - 4/16/2020 @ 14:55 - in 15-minute interval (from U24 logger) ▪ 8/22/2020 @ 11:05 - 9/3/2020 @ 12:05 - in 15-minute interval (from U24 logger)	Used temperature records from three different sensors for temperature record: ▪CS451 sensor buried around 2/6/2020 storm when big flux of gravel filled gage pool. Used Onset U24 temperature data from 2/6/2020 to 4/16/2020. ▪added Onset U22 sensor to gage pool on 4/16/2020 visit. Used 5 min data from U22 after that except from 8/22/2020 to 9/3/2020 when U22 memory was full; used U24 data during that period.
MONMS	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	▪10/1/2019 @ 00:00 - 12/9/2019 @ 13:15 - in 15-minute interval (from U20 logger) ▪ 2/6/2020 @ 14:30 - 4/16/2020 @ 14:00 - in 15-minute interval (from U20 logger)	Used temperature records from three different sensors for temperature record: ▪CS451 sensor or Onset U20 in stilling well in catch basin from 10/1/2019 - 4/16/2020. ▪U22 in main flow through catch basin from 4/16/2020 to 1/1/2021.
SEIMN	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	▪ All data came from 109UL sensor. YSI observations consistently 0.1°C greater than instrument reading from sensor. Although within 0.2°C, applied 0.1°C offset to instrument readings to match YSI observations. ▪ Big dip in temperature on 5/6/2020 - multiple logs, left in record
SEIMS	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	
TOSMI	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	On 10/21/2019 YSI observation > 0.3°C than instrument reading. Didn't shift to this as all other YSI observations were in agreement with instrument readings in this data set.
TOSMO	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	
TYLMI	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	None	

Site Code	Data Rated	Gaps*	Notes*
TYLMO	**Good** - Good agreement between instrument readings and YSI observations (within 0.2°C)	▪1/28/2020 @ 09:05 - 1/30/2020 @ 16:20 - 109UL sensor dry	

* All times listed are in Pacific Daylight Savings Time (GMT - 07:00)

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 4 below for comment on data quality and gaps in specific precipitation data. See Figure 2 in Appendix A for comparison to adjacent rain gages.

Table 4. Precipitation data recorded for the RPWS from October 1, 2019 to December 31, 2020.

Site	Data Quality	Missing Data
RG_EVA	Good record	No gaps
RG_MON	Good record	No gaps
RG_TOS	Good record	No gaps

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 discharge gages were updated via telemetry, ultimately the final continuous hydrologic data was input into the King County Hydrologic database with a supervised process using a desktop computer application. The technician worked 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 were noted on the plot, along with explanatory notes. The plot was stored in the project file for the gage along with field notes and other materials. Rating curve development and gage problem solving occurred in a collegial environment with the team staff. Recorded data and field measurements were reviewed throughout the year to identify problems and target necessary measurements.

Annual review of the water year was performed after the final supervised workup. Data are typically reviewed by a different team member than who performed the initial workup, but due to time and staffing constraints, review of discharge data was performed by the field technician. A spreadsheet template was 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 in Appendix B.

RPWS 10/1/2019 to 12/31/2020

Rainfall totals were slightly above average at the NOVH rain gage (data from 2000-2021) in the Redmond, WA area due to a relatively wet spring, though both falls were drier than average (see Figure 1).

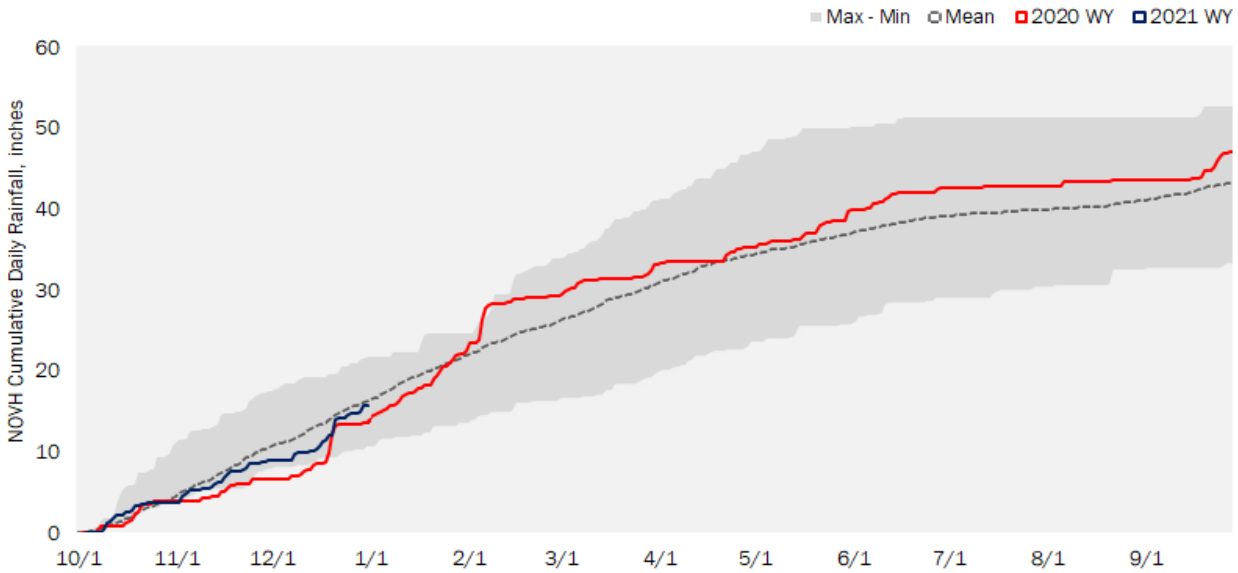


Figure 1. Cumulative rainfall at NOVH rain gage (in Redmond, WA) by water year (10/1 to 9/30). Includes data from 2000 to 2020. 2020 and 2021 water years are shown in red and blue, respectively. Average cumulative rainfall is shown in a gray dashed line. The range between the wettest and driest water years is shaded in dark gray.

The largest rainfall events occurred in December 2019, February 2020, and December of 2020 (see Table 5 below). The storm event ending on 12/20/2019 totaled 3.16”, an approximate 25-

year 24-hour precipitation total (King County 2016). Discharge was measured on five of the ten largest rainfall events, including the four largest.

Table 5. The ten largest 24-hour rainfall totals recorded at the Monticello rain gage (RG_MON) from October 1, 2019 to December 31, 2020. Dates where discharge measurements took place are shaded in blue.

Ending Date	24-hr. total (in)
12/20/2019	3.16
2/6/2020	2.59
12/22/2020	2.04
12/21/2020	1.45
5/31/2020	1.41
2/7/2020	1.28
9/24/2020	1.21
2/1/2020	1.12
10/10/2020	1.10
4/23/2020	1.07

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 6 below for a summary of missing discharge data by station.

Table 6. Periods of missing discharge data for the RPWS from October 1, 2019 to December 31, 2020.

Site	Notes*
COLM	▪No data from 9/3/2020 @ 14:30 to 9/19/2020 @ 19:50 - channel dry.
COUMI	▪ No data 12/19/2019 18:20 to 12/20/2019 22:55 - wave dynamic at gauge, continuous stage record unusable ▪ 15 minute data from 1/30/2020 12:30 to 2/5/2020 02:45 - used U20 instrument readings because CS451 readings affected by fine sediment. ▪ No data 2/5/2020 02:45 to 3/5/2020 13:55 - both U20 and CS451 stage records bad because probes packed in fine sediment.
COUMO	None
EVALSS	None
EVAMS	None

Site	Notes*
MONMN	None
MONMO	None
MONMS	▪Data from 6/9/2020 12:15 to 9/2/2020 15:30 in 15-minute data. Used record from U20 logger because CS451 cable sliced by vandals.
SEIMN	None
SEIMS	▪Data from 10/1/2019 00:00 to 10/31/2019 14:15 in 15-minute interval - readings from U20 probe due to malfunction of CS451 probe. ▪Data from 12/24/2020 00:00 to 1/1/2021 00:00 in 15-minute interval - readings from U20 probe due to malfunction of CS451 probe.
TOSMI	None
TOSMO	None
TYLMI	None
TYLMO	None

* All times listed are in Pacific Daylight Savings Time (GMT – 07:00)

Uncertain 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 most common cause of uncertain flow data was instability of section controls (i.e., objects in a stream channel that control the water level at the stream gage) for stations with non-engineered hydraulics. These stations include COUMI, EVAMS, MONMN, and TYLMI. See Table 7 for a summary of data uncertainties.

Table 7. Summary of data with notable uncertainty for the RPWS from October 1, 2019 to December 31, 2020.

Site	Notes*
COLM	▪Some uncertainty around larger storm peaks - more recent high flow measurement needed. ▪Applied moderate rating shift to period between 11/13/2019 and 2/6/2020
COUMI	▪ Warning flag placed on data from 10/21/2019 18:05 to 10/31/2019 10:35 - big shifts applied during this session due to changes in section control. ▪ Moderate shifts applied from 5/15/2020 to 5/31/2020 due to changes in section control. ▪ Moderate shifts applied from 10/21/2020 to 11/13/2020 due to changes in section control. ▪ Moderate shifts applied from 12/15/2020 to 12/21/2020 due to changes in section control.
COUMO	▪ Big rating shift to the right on rising limb of 12/21/2020 storm to meet M#59 and account for baseflow change afterward. May have created too large of a peak.
EVALSS	None
EVAMS	▪Warning flag placed on records from 12/20/2019 12:00 to 2/3/2020 12:00 - big scour from high flow on 12/20/2019 event. Rebuilt section control on 2/3/2020 site visit ▪Flow drops on 4/17/2020 - lower during summer. In record, not due to rating shift. Not sure why flow went so low here, possibly anthropogenic explanation. ▪Didn't shift rating to measurements #48 or #55. Velocimeter malfunctioned during #48. #55 plotted way to right of rating #06 - no apparent scour in record or photos, possible just a bad measurement.
MONMN	▪12/21/2020 15:05 to 1/1/2021 00:00 flagged with warning flag - big shift after 12/21 storm. ▪Some uncertainty around largest storm flows on 12/20/2019, 2/6/2020, and 12/21/2020.
MONMO	None
MONMS	None
SEIMN	▪Warning flag placed on data from 11/27/2020 14:00 to 12/9/2020 15:25 - big rating shift to correct for sticks lodged in weir.
SEIMS	None
TOSMI	▪ Didn't shift to M#41 on 10/21/2019 - no obvious problem but too much water in channel relative to TOSMO. ▪ Baseflow relationship with TOSMI a little too close at times. Didn't want to shift too far from measured flows to try to maintain. I suspect this more of an issue with TOSMI flows than TOSMO.
TOSMO	▪ I believe 12/21/20 storm peak is too high. Rating OK for that stage but I suspect debris in the weir may have impacted stage readings and incorrectly added water in the channel. ▪ Baseflow relationship with TOSMI a little too close at times. Didn't want to shift too far from measured flows to try to maintain. I suspect this more of an issue with TOSMI flows than TOSMO.
TYLMI	▪ Big shifts due to debris and scour in 12/20/2019 storm. ▪ Section control is very wide creating poor resolution in low end of ratings. Poor relationship between baseflows at TYLMI and TYLMO - often more water at TYLMI, which I don't think is real. Tinkered with taking water out of the channel at TYLMI but it required deviating too far from observed flows.
TYLMO	▪ Relationship between TYLMO and TYLMI during baseflows at times too close to one another. This is largely due to imprecision with the low end of the ratings for both TYLMO and TYLMI. I took a little water out of the channel at TYLMI to try to correct while not deviated too far from the observed flows. ▪Some moderate shifts around 12/20/2019 and 2/6/2020 storms to match measured flows.

* All times listed are in Pacific Daylight Savings Time (GMT – 07:00)

Data Rating

Continuous discharge data from each station was given a rating, from poor to good, for the period beginning on October 1, 2019 and ending on December 31, 2020. See Table 8 for a summary of data quality ratings. 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. 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 Table C in Appendix A for a table comparing measured vs. calculated discharge values for each station).

Table 8. Summary of discharge data quality rating from October 1, 2019 to December 31, 2020.

Site	Notes
COLM	**Fair to good record**. Channel relatively stable. Mostly small rating shifts to match flow measurements.
COUMI	**Poor record.** Control very unstable. Pressure transducer prone to plugging by sediment which produces poor continuous stage record. Wave dynamic at outlet of culvert affects high flow water level. Downstream site more promising.
COUMO	**Fair record**. Moderate rating shifts to account for changes to section control. Some scour/fill apparent but not major.
EVALSS	**Good record**. A bit of channel instability around high flow events but captured with discharge measurements. Good range of flow measurements on ratings.
EVAMS	**Fair to good record**. Good range of flow measurements. Only questionable period noted above due to scour. Channel and rating stable after that.
MONMN	**Fair record.** Good coverage of rating with flow measurements but some channel instability, especially around large storm flows on 12/20/2019, 2/6/2020, and 12/21/2020.
MONMO	**Good record.** Engineered control is stable and clear of debris. Measured flow about 50% of rated flow.
MONMS	**Good record.** Engineered control with little debris.
SEIMN	**Fair Record**. Gravel frequently builds up on weir - Rating for good when weir ramp clear of gravel but moderate (but consistent) shifts needed to correct when buildup occurs.
SEIMS	**Good Record.** Engineered control is stable, very little debris buildup.
TOSMI	**Fair record.** Good coverage of flow measurements and no major changes to channel. Section control prone to debris. I've never felt comfortable with the relationship between TOSMI and TOSMO.
TOSMO	**Good record.** Stable, engineered control. Minimal debris in weir.

Site	Notes
TYLMI	**Fair to poor record**. Section control unstable and prone to debris. Poor relationship between flows at TYLMI and TYLMO; I believe that to be mostly due to poor precision at low end of rating at TYLMI. Good coverage by flow measurements, though.
TYLMO	**Fair record.** Good coverage with flow measurements. Some channel instability around larger storm events.

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, WA.

APPENDIX A: ADDITIONAL TABLES AND FIGURES

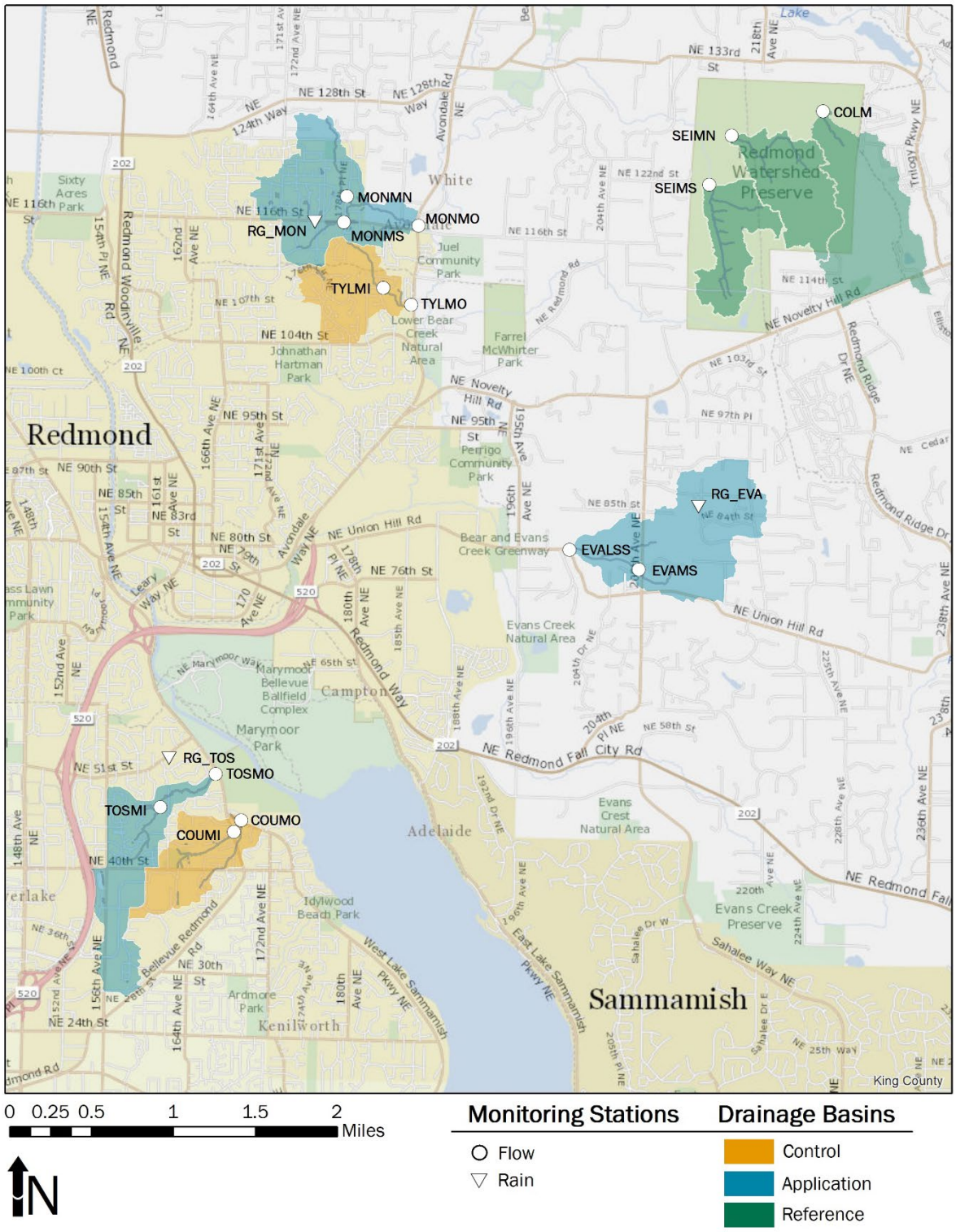


Figure A | A map of RPWS hydrologic monitoring sites.

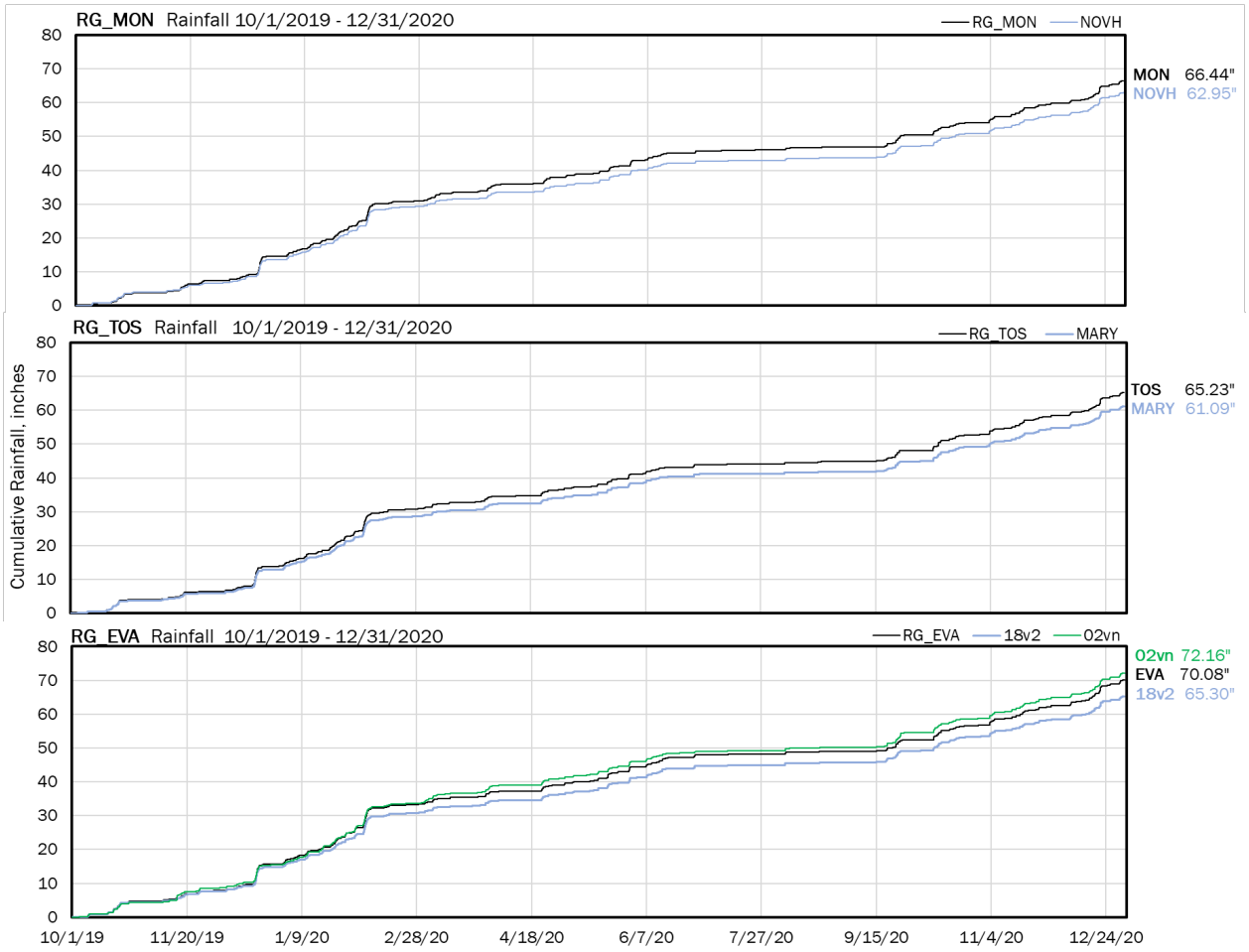


Figure B | Comparison of RPWS rain gages to nearby rain gages in King County's hydrologic monitoring program.

Site	Max Discharge Measurement	Max Discharge Measurement	Max Discharge Record in Session
	7/1/2019 - 2/5/2021*	9/1/2015 - 2/5/2021**	10/1/2019 - 12/31/2020
	cubic feet per second (cfs)		
COLM	4.72	16.2	27.6
COUMI	5.44	5.70	6.16
COUMO	8.17	15.4	24.5
EVALSS	22.8	22.8	25.1
EVAMS	6.45	7.09	10.1
MONMN	16.3	16.3	26.4
MONMO	22.8	28.3	44.0
MONMS	2.75	3.61	4.52
SEIMN	1.26	6.32	12.48
SEIMS	1.03	8.63	8.24
TOSMI	10.5	13.8	11.2
TOSMO	9.35	14.0	26.7
TYLMI	4.66	4.66	6.08
TYLMO	9.02	10.9	16.9

* time period where flow measurements were taken to develop ratings used to develop data from 10/1/2019 to 12/31/2020
**length of time from start of RPWS project to most recent measurements

Table C | 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 Tables Used to Estimate Discharge at EVALSS.

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.12	0.6
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
0.2	1.71
0.21	1.89
0.22	2.08
0.23	2.27
0.24	2.48
0.25	2.7
0.26	2.92
0.27	3.16
0.28	3.4
0.29	3.65
0.3	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
0.4	6.98
0.41	7.33
0.42	7.7
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	10.5

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

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.5	10.93
0.51	11.38
0.52	11.83
0.53	12.3
0.54	12.77
0.55	13.25
0.56	13.74
0.57	14.24
0.58	14.74
0.59	15.26
0.6	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
0.7	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	26.1
0.78	26.78
0.79	27.48
0.8	28.18
0.81	28.9
0.82	29.62
0.83	30.35
0.84	31.1
0.85	31.85
0.86	32.6
0.87	33.37

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

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.88	34.15
0.89	34.94
0.9	35.73
0.91	36.54
0.92	37.35
0.93	38.17
0.94	39
0.95	39.84
0.96	40.69
0.97	41.55
0.98	42.42
0.99	43.3
1	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
1.1	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
1.2	63.79
1.21	64.87
1.22	65.95
1.23	67.05
1.24	68.15
1.25	69.26

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

EVALSS Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.26	70.38
1.27	71.51
1.28	72.65
1.29	73.8
1.3	74.95
1.31	76.12
1.32	77.3
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
1.4	87.02
1.41	88.28
1.42	89.55
1.43	90.82
1.44	92.11
1.45	93.4
1.46	94.7
1.47	96.01
1.48	97.33
1.49	98.66
1.5	100

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

EVALSS Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.05	0.38
0.06	0.46
0.07	0.54
0.08	0.61
0.09	0.69
0.1	0.77
0.11	0.85
0.12	0.93
0.13	1.01
0.14	1.09
0.15	1.16
0.16	1.24
0.17	1.32
0.18	1.4
0.19	1.48
0.2	1.56
0.21	1.64
0.22	1.72
0.23	1.8
0.24	1.98
0.25	2.16
0.26	2.36
0.27	2.56
0.28	2.78
0.29	3
0.3	3.23
0.31	3.48
0.32	3.73
0.33	3.99
0.34	4.26
0.35	4.54
0.36	4.83
0.37	5.14
0.38	5.45
0.39	5.77
0.4	6.1
0.41	6.44
0.42	6.79

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

EVALSS Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.43	7.15
0.44	7.53
0.45	7.91
0.46	8.3
0.47	8.7
0.48	9.12
0.49	9.54
0.5	9.98
0.51	10.42
0.52	10.88
0.53	11.34
0.54	11.82
0.55	12.31
0.56	12.81
0.57	13.32
0.58	13.84
0.59	14.37
0.6	14.91
0.61	15.47
0.62	16.03
0.63	16.61
0.64	17.19
0.65	17.79
0.66	18.4
0.67	19.02
0.68	19.65
0.69	20.3
0.7	20.95
0.71	21.62
0.72	22.29
0.73	22.98
0.74	23.68
0.75	24.39
0.76	25.12
0.77	25.85
0.78	26.6
0.79	27.35
0.8	28.12

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

EVALSS Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.81	28.9
0.82	29.7
0.83	30.5
0.84	31.32
0.85	32.15
0.86	32.99
0.87	33.84
0.88	34.7
0.89	35.58
0.9	36.46
0.91	37.36
0.92	38.27
0.93	39.2
0.94	40.13
0.95	41.08
0.96	42.04
0.97	43.01
0.98	44
0.99	44.99
1	46

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

EVAMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.13	0.1
0.14	0.13
0.15	0.17
0.16	0.21
0.17	0.26
0.18	0.32
0.19	0.39
0.2	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	1.4
0.28	1.6
0.29	1.74
0.3	1.9
0.31	2.06
0.32	2.22
0.33	2.4
0.34	2.58
0.35	2.78
0.36	2.98
0.37	3.18
0.38	3.4
0.39	3.63
0.4	3.86
0.41	4.1
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
0.5	6.69

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

EVAMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.51	7.03
0.52	7.38
0.53	7.73
0.54	8.1
0.55	8.47
0.56	8.86
0.57	9.25
0.58	9.66
0.59	10.07
0.6	10.5
0.61	11
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
0.7	16.18
0.71	16.84
0.72	17.51
0.73	18.2
0.74	18.91
0.75	19.63
0.76	20.38
0.77	21.14
0.78	21.92
0.79	22.71
0.8	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

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

EVAMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.89	31.73
0.9	32.74
0.91	33.77
0.92	34.82
0.93	35.9
0.94	36.99
0.95	38.1
0.96	39.24
0.97	40.4
0.98	41.58
0.99	42.78
1	44

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

EVAMS Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.1	0.1
0.11	0.13
0.12	0.15
0.13	0.19
0.14	0.22
0.15	0.26
0.16	0.31
0.17	0.35
0.18	0.4
0.19	0.46
0.2	0.52
0.21	0.58
0.22	0.65
0.23	0.72
0.24	0.8
0.25	0.88
0.26	0.97
0.27	1.06
0.28	1.16
0.29	1.26
0.3	1.36
0.31	1.47
0.32	1.59
0.33	1.71
0.34	1.83
0.35	1.96
0.36	2.1
0.37	2.24
0.38	2.39
0.39	2.54
0.4	2.7
0.41	2.86
0.42	3.03
0.43	3.2
0.44	3.38
0.45	3.57
0.46	3.76
0.47	3.96

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

EVAMS Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.48	4.16
0.49	4.37
0.5	4.58
0.51	4.8
0.52	5.03
0.53	5.26
0.54	5.5
0.55	5.75
0.56	6
0.57	6.26
0.58	6.52
0.59	6.79
0.6	7.07
0.61	7.35
0.62	7.64
0.63	7.94
0.64	8.24
0.65	8.55
0.66	8.86
0.67	9.19
0.68	9.51
0.69	9.85
0.7	10.19
0.71	10.54
0.72	10.9
0.73	11.26
0.74	11.63
0.75	12.01
0.76	12.39
0.77	12.78
0.78	13.18
0.79	13.59
0.8	14

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

EVAMS Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.05	0.07
0.06	0.1
0.07	0.13
0.08	0.16
0.09	0.19
0.1	0.23
0.11	0.27
0.12	0.32
0.13	0.36
0.14	0.41
0.15	0.47
0.16	0.52
0.17	0.58
0.18	0.64
0.19	0.7
0.2	0.76
0.21	0.83
0.22	0.9
0.23	0.97
0.24	1.05
0.25	1.12
0.26	1.2
0.27	1.28
0.28	1.36
0.29	1.45
0.3	1.59
0.31	1.73
0.32	1.89
0.33	2.05
0.34	2.22
0.35	2.4
0.36	2.59
0.37	2.78
0.38	2.99
0.39	3.2
0.4	3.43
0.41	3.66
0.42	3.91

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

EVAMS Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.43	4.16
0.44	4.42
0.45	4.7
0.46	4.98
0.47	5.28
0.48	5.58
0.49	5.9
0.5	6.23
0.51	6.57
0.52	6.92
0.53	7.28
0.54	7.65
0.55	8.03
0.56	8.43
0.57	8.84
0.58	9.26
0.59	9.69
0.6	10.14
0.61	10.6
0.62	11.07
0.63	11.55
0.64	12.05
0.65	12.56
0.66	13.09
0.67	13.62
0.68	14.17
0.69	14.74
0.7	15.32
0.71	15.91
0.72	16.51
0.73	17.14
0.74	17.77
0.75	18.42
0.76	19.08
0.77	19.76
0.78	20.46
0.79	21.17
0.8	21.89

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

EVAMS Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.81	22.63
0.82	23.39
0.83	24.16
0.84	24.94
0.85	25.75
0.86	26.56
0.87	27.4
0.88	28.25
0.89	29.12
0.9	30

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

MONMO 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
0.1	0.08
0.11	0.09
0.12	0.1
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
0.2	0.36
0.21	0.41
0.22	0.46
0.23	0.51
0.24	0.57
0.25	0.63
0.26	0.7
0.27	0.77
0.28	0.84
0.29	0.92
0.3	1
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

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

MONMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.4	2.12
0.41	2.26
0.42	2.4
0.43	2.55
0.44	2.71
0.45	2.87
0.46	3.04
0.47	3.22
0.48	3.4
0.49	3.59
0.5	3.78
0.51	3.98
0.52	4.19
0.53	4.4
0.54	4.62
0.55	4.85
0.56	5.08
0.57	5.32
0.58	5.57
0.59	5.82
0.6	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
0.7	9.09
0.71	9.43
0.72	9.78
0.73	10.13
0.74	10.5
0.75	10.81
0.76	11.13
0.77	11.45
0.78	11.78

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

MONMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.79	12.12
0.8	12.45
0.81	12.8
0.82	13.15
0.83	13.5
0.84	13.83
0.85	14.16
0.86	14.49
0.87	14.83
0.88	15.17
0.89	15.52
0.9	15.87
0.91	16.22
0.92	16.58
0.93	16.94
0.94	17.3
0.95	17.67
0.96	18.05
0.97	18.42
0.98	18.8
0.99	19.19
1	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
1.1	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

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

MONMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.18	27.24
1.19	27.7
1.2	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
1.3	33.04
1.31	33.55
1.32	34.06
1.33	34.58
1.34	35.1
1.35	35.63
1.36	36.15
1.37	36.69
1.38	37.22
1.39	37.76
1.4	38.31
1.41	38.86
1.42	39.41
1.43	39.96
1.44	40.52
1.45	41.08
1.46	41.65
1.47	42.22
1.48	42.8
1.49	43.38
1.5	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

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

MONMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.57	48.15
1.58	48.76
1.59	49.38
1.6	50

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

MONMN Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.22	0.02
0.23	0.03
0.24	0.03
0.25	0.05
0.26	0.06
0.27	0.07
0.28	0.09
0.29	0.12
0.3	0.15
0.31	0.18
0.32	0.22
0.33	0.25
0.34	0.28
0.35	0.32
0.36	0.36
0.37	0.41
0.38	0.45
0.39	0.51
0.4	0.56
0.41	0.62
0.42	0.69
0.43	0.76
0.44	0.84
0.45	0.92
0.46	1.01
0.47	1.11
0.48	1.21
0.49	1.32
0.5	1.44
0.51	1.57
0.52	1.7
0.53	1.78
0.54	1.86
0.55	1.95
0.56	2.04
0.57	2.13
0.58	2.22
0.59	2.31

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

MONMN Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.6	2.41
0.61	2.51
0.62	2.61
0.63	2.71
0.64	2.82
0.65	2.93
0.66	3.04
0.67	3.15
0.68	3.27
0.69	3.39
0.7	3.51
0.71	3.63
0.72	3.76
0.73	4.02
0.74	4.29
0.75	4.58
0.76	4.88
0.77	5.2
0.78	5.53
0.79	5.88
0.8	6.25
0.81	6.63
0.82	7.04
0.83	7.46
0.84	7.9
0.85	8.37
0.86	8.85
0.87	9.36
0.88	9.89
0.89	10.45
0.9	11.02
0.91	11.63
0.92	12.26
0.93	12.91
0.94	13.59
0.95	14.31
0.96	15.05
0.97	15.82

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

MONMN Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.98	16.62
0.99	17.45
1	18.32
1.01	19.22
1.02	20.15
1.03	21.12
1.04	22.13
1.05	23.17
1.06	24.26
1.07	25.38
1.08	26.55
1.09	27.75
1.1	29

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

MONMN Rating Table 09	
Water Level (ft)	Discharge (cfs)
0.01	0
0.02	0
0.03	0
0.04	0
0.05	0
0.06	0
0.07	0
0.08	0
0.09	0
0.1	0
0.11	0
0.12	0
0.13	0
0.14	0
0.15	0.01
0.16	0.01
0.17	0.01
0.18	0.01
0.19	0.02
0.2	0.02
0.21	0.02
0.22	0.02
0.23	0.03
0.24	0.03
0.25	0.05
0.26	0.06
0.27	0.07
0.28	0.09
0.29	0.12
0.3	0.15
0.31	0.18
0.32	0.22
0.33	0.25
0.34	0.28
0.35	0.32
0.36	0.36
0.37	0.41
0.38	0.45

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

MONMN Rating Table 09	
Water Level (ft)	Discharge (cfs)
0.39	0.51
0.4	0.56
0.41	0.62
0.42	0.69
0.43	0.76
0.44	0.84
0.45	0.92
0.46	1.01
0.47	1.11
0.48	1.21
0.49	1.32
0.5	1.44
0.51	1.57
0.52	1.7
0.53	1.78
0.54	1.86
0.55	1.95
0.56	2.04
0.57	2.13
0.58	2.22
0.59	2.31
0.6	2.41
0.61	2.51
0.62	2.61
0.63	2.71
0.64	2.82
0.65	2.93
0.66	3.04
0.67	3.15
0.68	3.27
0.69	3.39
0.7	3.51
0.71	3.63
0.72	3.76
0.73	3.93
0.74	4.1
0.75	4.27
0.76	4.45

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

MONMN Rating Table 09	
Water Level (ft)	Discharge (cfs)
0.77	4.64
0.78	4.83
0.79	5.03
0.8	5.23
0.81	5.44
0.82	5.65
0.83	5.87
0.84	6.1
0.85	6.33
0.86	6.56
0.87	6.81
0.88	7.06
0.89	7.31
0.9	7.57
0.91	7.84
0.92	8.11
0.93	8.39
0.94	8.68
0.95	8.97
0.96	9.27
0.97	9.57
0.98	9.89
0.99	10.21
1	10.53
1.01	10.87
1.02	11.21
1.03	11.56
1.04	11.91
1.05	12.28
1.06	12.65
1.07	13.02
1.08	13.41
1.09	13.8
1.1	14.2
1.11	14.61
1.12	15.03
1.13	15.46
1.14	15.89

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

MONMN Rating Table 09	
Water Level (ft)	Discharge (cfs)
1.15	16.33
1.16	16.78
1.17	17.24
1.18	17.7
1.19	18.18
1.2	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
1.3	23.99
1.31	24.57
1.32	25.16
1.33	25.77
1.34	26.38
1.35	27

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

MONMN Rating Table 10	
Water Level (ft)	Discharge (cfs)
0.18	0.02
0.19	0.03
0.2	0.03
0.21	0.04
0.22	0.05
0.23	0.06
0.24	0.08
0.25	0.09
0.26	0.11
0.27	0.13
0.28	0.15
0.29	0.18
0.3	0.21
0.31	0.25
0.32	0.28
0.33	0.33
0.34	0.38
0.35	0.43
0.36	0.49
0.37	0.56
0.38	0.63
0.39	0.71
0.4	0.8
0.41	0.89
0.42	1
0.43	1.09
0.44	1.18
0.45	1.28
0.46	1.38
0.47	1.49
0.48	1.6
0.49	1.72
0.5	1.85
0.51	1.99
0.52	2.13
0.53	2.27
0.54	2.43
0.55	2.59

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

MONMN Rating Table 10	
Water Level (ft)	Discharge (cfs)
0.56	2.76
0.57	2.94
0.58	3.13
0.59	3.32
0.6	3.53
0.61	3.74
0.62	3.96
0.63	4.19
0.64	4.43
0.65	4.68
0.66	4.94
0.67	5.21
0.68	5.49
0.69	5.78
0.7	6.08
0.71	6.39
0.72	6.71
0.73	7.05
0.74	7.4
0.75	7.75
0.76	8.13
0.77	8.51
0.78	8.91
0.79	9.32
0.8	9.74
0.81	10.18
0.82	10.63
0.83	11.09
0.84	11.57
0.85	12.07
0.86	12.58
0.87	13.1
0.88	13.64
0.89	14.19
0.9	14.77
0.91	15.35
0.92	15.96
0.93	16.58

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

MONMN Rating Table 10	
Water Level (ft)	Discharge (cfs)
0.94	17.22
0.95	17.87
0.96	18.55
0.97	19.24
0.98	19.95
0.99	20.68
1	21.42
1.01	22.19
1.02	22.98
1.03	23.78
1.04	24.61
1.05	25.45
1.06	26.32
1.07	27.21
1.08	28.12
1.09	29.05
1.1	30
1.11	30.84
1.12	31.7
1.13	32.57
1.14	33.46
1.15	34.37
1.16	35.29
1.17	36.23
1.18	37.18
1.19	38.16
1.2	39.14
1.21	40.15
1.22	41.17
1.23	42.21
1.24	43.27
1.25	44.35
1.26	45.44
1.27	46.55
1.28	47.68
1.29	48.83
1.3	50

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

MONMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.09	0.01
0.1	0.01
0.11	0.02
0.12	0.03
0.13	0.04
0.14	0.05
0.15	0.06
0.16	0.08
0.17	0.09
0.18	0.1
0.19	0.11
0.2	0.13
0.21	0.14
0.22	0.15
0.23	0.17
0.24	0.18
0.25	0.2
0.26	0.21
0.27	0.23
0.28	0.25
0.29	0.27
0.3	0.28
0.31	0.3
0.32	0.32
0.33	0.35
0.34	0.37
0.35	0.39
0.36	0.41
0.37	0.43
0.38	0.46
0.39	0.48
0.4	0.51
0.41	0.53
0.42	0.56
0.43	0.59
0.44	0.62
0.45	0.65
0.46	0.67

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

MONMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.47	0.7
0.48	0.74
0.49	0.77
0.5	0.8
0.51	0.83
0.52	0.86
0.53	0.9
0.54	0.93
0.55	0.97
0.56	1
0.57	1.04
0.58	1.08
0.59	1.12
0.6	1.15
0.61	1.19
0.62	1.23
0.63	1.27
0.64	1.31
0.65	1.36
0.66	1.4
0.67	1.44
0.68	1.49
0.69	1.53
0.7	1.58
0.71	1.62
0.72	1.67
0.73	1.72
0.74	1.76
0.75	1.81
0.76	1.86
0.77	1.91
0.78	1.96
0.79	2.01
0.8	2.06
0.81	2.12
0.82	2.17
0.83	2.22
0.84	2.28

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

MONMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.85	2.33
0.86	2.39
0.87	2.44
0.88	2.5
0.89	2.56
0.9	2.62
0.91	2.68
0.92	2.74
0.93	2.8
0.94	2.86
0.95	2.92
0.96	2.98
0.97	3.04
0.98	3.11
0.99	3.17
1	3.24
1.01	3.3
1.02	3.37
1.03	3.44
1.04	3.5
1.05	3.57
1.06	3.64
1.07	3.71
1.08	3.78
1.09	3.85
1.1	3.93
1.11	4
1.12	4.07
1.13	4.14
1.14	4.22
1.15	4.29
1.16	4.37
1.17	4.45
1.18	4.52
1.19	4.6
1.2	4.68
1.21	4.76
1.22	4.84

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

MONMS Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.23	4.92
1.24	5
1.25	5.08
1.26	5.16
1.27	5.25
1.28	5.33
1.29	5.41
1.3	5.5

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

TOSMO Rating Table 02	
Water Level (ft)	Discharge (cfs)
0.1	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	0.5
0.18	0.55
0.19	0.61
0.2	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
0.3	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
0.4	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

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

TOSMO Rating Table 02	
Water Level (ft)	Discharge (cfs)
0.48	4.15
0.49	4.36
0.5	4.58
0.51	4.8
0.52	5.03
0.53	5.27
0.54	5.51
0.55	5.76
0.56	6.02
0.57	6.28
0.58	6.55
0.59	6.82
0.6	7.1
0.61	7.39
0.62	7.69
0.63	7.99
0.64	8.3
0.65	8.61
0.66	8.93
0.67	9.26
0.68	9.6
0.69	9.9
0.7	10.2
0.71	10.5
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
0.8	13.47
0.81	13.83
0.82	14.19
0.83	14.55
0.84	14.92
0.85	15.29

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

TOSMO Rating Table 02	
Water Level (ft)	Discharge (cfs)
0.86	15.67
0.87	16.05
0.88	16.44
0.89	16.83
0.9	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	21.46
1.01	21.91
1.02	22.37
1.03	22.83
1.04	23.29
1.05	23.76
1.06	24.23
1.07	24.71
1.08	25.2
1.09	25.69
1.1	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
1.2	31.39
1.21	31.94
1.22	32.49
1.23	33.05

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

TOSMO Rating Table 02	
Water Level (ft)	Discharge (cfs)
1.24	33.61
1.25	34.18
1.26	34.76
1.27	35.33
1.28	35.92
1.29	36.5
1.3	37.1
1.31	37.69
1.32	38.3
1.33	38.9
1.34	39.52
1.35	40.13
1.36	40.76
1.37	41.39
1.38	42.02
1.39	42.66
1.4	43.3
1.41	43.95
1.42	44.6
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
1.5	50

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

TOSMI Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.08	0.06
0.09	0.08
0.1	0.1
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	0.4
0.2	0.45
0.21	0.5
0.22	0.56
0.23	0.61
0.24	0.67
0.25	0.73
0.26	0.8
0.27	0.89
0.28	0.99
0.29	1.1
0.3	1.21
0.31	1.33
0.32	1.46
0.33	1.6
0.34	1.74
0.35	1.9
0.36	2.06
0.37	2.23
0.38	2.41
0.39	2.6
0.4	2.8
0.41	3.01
0.42	3.22
0.43	3.45
0.44	3.69
0.45	3.94

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

TOSMI Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.46	4.2
0.47	4.47
0.48	4.75
0.49	5.05
0.5	5.35
0.51	5.67
0.52	6
0.53	6.2
0.54	6.41
0.55	6.62
0.56	6.83
0.57	7.05
0.58	7.27
0.59	7.49
0.6	7.71
0.61	7.94
0.62	8.17
0.63	8.4
0.64	8.64
0.65	8.88
0.66	9.12
0.67	9.36
0.68	9.61
0.69	9.86
0.7	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
0.8	12.79
0.81	13.07
0.82	13.35
0.83	13.64

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

TOSMI Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.84	13.93
0.85	14.22
0.86	14.52
0.87	14.82
0.88	15.12
0.89	15.42
0.9	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	18.92
1.01	19.26
1.02	19.59
1.03	19.93
1.04	20.27
1.05	20.62
1.06	20.96
1.07	21.31
1.08	21.66
1.09	22.02
1.1	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
1.2	26.07
1.21	26.45

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

TOSMI Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.22	26.83
1.23	27.22
1.24	27.61
1.25	28
1.26	28.4
1.27	28.79
1.28	29.19
1.29	29.6
1.3	30

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

TOSMI Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.17	0.06
0.18	0.08
0.19	0.1
0.2	0.12
0.21	0.15
0.22	0.19
0.23	0.23
0.24	0.28
0.25	0.34
0.26	0.4
0.27	0.48
0.28	0.56
0.29	0.66
0.3	0.76
0.31	0.89
0.32	1.02
0.33	1.17
0.34	1.34
0.35	1.46
0.36	1.59
0.37	1.73
0.38	1.88
0.39	2.03
0.4	2.2
0.41	2.37
0.42	2.55
0.43	2.74
0.44	2.94
0.45	3.14
0.46	3.36
0.47	3.59
0.48	3.82
0.49	4.07
0.5	4.33
0.51	4.6
0.52	4.88
0.53	5.17
0.54	5.47

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

TOSMI Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.55	5.79
0.56	6.11
0.57	6.45
0.58	6.8
0.59	7.01
0.6	7.22
0.61	7.43
0.62	7.65
0.63	7.86
0.64	8.08
0.65	8.31
0.66	8.53
0.67	8.76
0.68	8.99
0.69	9.23
0.7	9.46
0.71	9.7
0.72	9.94
0.73	10.19
0.74	10.43
0.75	10.68
0.76	10.93
0.77	11.19
0.78	11.44
0.79	11.7
0.8	11.96
0.81	12.23
0.82	12.49
0.83	12.76
0.84	13.03
0.85	13.31
0.86	13.59
0.87	13.86
0.88	14.14
0.89	14.43
0.9	14.71
0.91	15
0.92	15.29

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

TOSMI Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.93	15.59
0.94	15.88
0.95	16.18
0.96	16.48
0.97	16.78
0.98	17.09
0.99	17.4
1	17.71
1.01	18.02
1.02	18.33
1.03	18.65
1.04	18.97
1.05	19.29
1.06	19.62
1.07	19.94
1.08	20.27
1.09	20.6
1.1	20.93
1.11	21.27
1.12	21.61
1.13	21.95
1.14	22.29
1.15	22.63
1.16	22.98
1.17	23.33
1.18	23.68
1.19	24.04
1.2	24.39
1.21	24.75
1.22	25.11
1.23	25.47
1.24	25.84
1.25	26.21
1.26	26.58
1.27	26.95
1.28	27.32
1.29	27.7
1.3	28.08

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

TOSMI Rating Table 05	
Water Level (ft)	Discharge (cfs)
1.31	28.46
1.32	28.84
1.33	29.22
1.34	29.61
1.35	30

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

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.37	0
0.38	0
0.39	0
0.4	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	0.3
0.5	0.33
0.51	0.35
0.52	0.38
0.53	0.41
0.54	0.44
0.55	0.47
0.56	0.5
0.57	0.54
0.58	0.57
0.59	0.61
0.6	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
0.7	1.18
0.71	1.25
0.72	1.32
0.73	1.39
0.74	1.46

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

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.75	1.54
0.76	1.63
0.77	1.71
0.78	1.8
0.79	1.89
0.8	1.99
0.81	2.09
0.82	2.19
0.83	2.29
0.84	2.4
0.85	2.52
0.86	2.64
0.87	2.76
0.88	2.88
0.89	3.02
0.9	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	5
1.01	5.17
1.02	5.35
1.03	5.53
1.04	5.72
1.05	5.91
1.06	6.1
1.07	6.3
1.08	6.5
1.09	6.71
1.1	6.93
1.11	7.14
1.12	7.37

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

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
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
1.2	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
1.3	12.26
1.31	12.59
1.32	12.92
1.33	13.26
1.34	13.6
1.35	13.95
1.36	14.31
1.37	14.67
1.38	15.04
1.39	15.41
1.4	15.8
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	19.1
1.49	19.55
1.5	20

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

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
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
1.6	24.89
1.61	25.42
1.62	25.96
1.63	26.5
1.64	27.06
1.65	27.62
1.66	28.19
1.67	28.77
1.68	29.36
1.69	29.96
1.7	30.56
1.71	31.17
1.72	31.8
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	36.4
1.8	37.09
1.81	37.79
1.82	38.51
1.83	39.23
1.84	39.96
1.85	40.7
1.86	41.45
1.87	42.21
1.88	42.98

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

COLM Rating Table 04	
Water Level (ft)	Discharge (cfs)
1.89	43.76
1.9	44.55
1.91	45.35
1.92	46.15
1.93	46.97
1.94	47.8
1.95	48.64
1.96	49.49
1.97	50.35
1.98	51.23
1.99	52.11
2	53

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

COLM Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.27	0
0.28	0
0.29	0
0.3	0.01
0.31	0.01
0.32	0.02
0.33	0.03
0.34	0.04
0.35	0.05
0.36	0.07
0.37	0.1
0.38	0.11
0.39	0.12
0.4	0.14
0.41	0.15
0.42	0.17
0.43	0.18
0.44	0.2
0.45	0.22
0.46	0.24
0.47	0.26
0.48	0.28
0.49	0.3
0.5	0.33
0.51	0.35
0.52	0.38
0.53	0.41
0.54	0.44
0.55	0.47
0.56	0.5
0.57	0.54
0.58	0.57
0.59	0.61
0.6	0.65
0.61	0.69
0.62	0.74
0.63	0.78
0.64	0.83

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

COLM Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.65	0.88
0.66	0.94
0.67	0.99
0.68	1.05
0.69	1.11
0.7	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	1.8
0.79	1.89
0.8	1.99
0.81	2.09
0.82	2.19
0.83	2.29
0.84	2.4
0.85	2.52
0.86	2.64
0.87	2.76
0.88	2.88
0.89	3.02
0.9	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	5
1.01	5.17
1.02	5.35

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

COLM Rating Table 05	
Water Level (ft)	Discharge (cfs)
1.03	5.53
1.04	5.72
1.05	5.91
1.06	6.1
1.07	6.3
1.08	6.5
1.09	6.71
1.1	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
1.2	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
1.3	12.26
1.31	12.59
1.32	12.92
1.33	13.26
1.34	13.6
1.35	13.95
1.36	14.31
1.37	14.67
1.38	15.04
1.39	15.41
1.4	15.8

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

COLM Rating Table 05	
Water Level (ft)	Discharge (cfs)
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	19.1
1.49	19.55
1.5	20
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
1.6	24.89
1.61	25.42
1.62	25.96
1.63	26.5
1.64	27.06
1.65	27.62
1.66	28.19
1.67	28.77
1.68	29.36
1.69	29.96
1.7	30.56
1.71	31.17
1.72	31.8
1.73	32.43
1.74	33.07
1.75	33.71
1.76	34.37
1.77	35.04
1.78	35.71

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

COLM Rating Table 05	
Water Level (ft)	Discharge (cfs)
1.79	36.4
1.8	37.09
1.81	37.79
1.82	38.51
1.83	39.23
1.84	39.96
1.85	40.7
1.86	41.45
1.87	42.21
1.88	42.98
1.89	43.76
1.9	44.55
1.91	45.35
1.92	46.15
1.93	46.97
1.94	47.8
1.95	48.64
1.96	49.49
1.97	50.35
1.98	51.23
1.99	52.11
2	53

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

SEIMN Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.1	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	0.1
0.18	0.13
0.19	0.16
0.2	0.2
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
0.3	0.73
0.31	0.79
0.32	0.85
0.33	0.91
0.34	0.97
0.35	1.03
0.36	1.1
0.37	1.17
0.38	1.24
0.39	1.31
0.4	1.39
0.41	1.46
0.42	1.54
0.43	1.63
0.44	1.71
0.45	1.8
0.46	1.89
0.47	1.98
0.48	2.07

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

SEIMN Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.49	2.17
0.5	2.27
0.51	2.37
0.52	2.47
0.53	2.58
0.54	2.69
0.55	2.8
0.56	2.91
0.57	3.03
0.58	3.15
0.59	3.27
0.6	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
0.7	4.77
0.71	4.92
0.72	5.08
0.73	5.24
0.74	5.4
0.75	5.56
0.76	5.72
0.77	5.89
0.78	6.06
0.79	6.24
0.8	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

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

SEIMN Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.88	7.92
0.89	8.12
0.9	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	10.5
1.01	10.74
1.02	10.98
1.03	11.22
1.04	11.46
1.05	11.71
1.06	11.96
1.07	12.22
1.08	12.48
1.09	12.74
1.1	13

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	0.1
0.08	0.13
0.09	0.16
0.1	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	0.5
0.19	0.55
0.2	0.61
0.21	0.67
0.22	0.73
0.23	0.8
0.24	0.87
0.25	0.94
0.26	1.01
0.27	1.09
0.28	1.17
0.29	1.25
0.3	1.33
0.31	1.42
0.32	1.51
0.33	1.6
0.34	1.71
0.35	1.81
0.36	1.93
0.37	2.04
0.38	2.16
0.39	2.29
0.4	2.42
0.41	2.55
0.42	2.68
0.43	2.82

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

SEIMS Rating Table 03	
Water Level (ft)	Discharge (cfs)
0.44	2.96
0.45	3.11
0.46	3.26
0.47	3.41
0.48	3.57
0.49	3.73
0.5	3.89
0.51	4.06
0.52	4.23
0.53	4.41
0.54	4.59
0.55	4.77
0.56	4.96
0.57	5.15
0.58	5.35
0.59	5.55
0.6	5.75
0.61	5.96
0.62	6.17
0.63	6.38
0.64	6.6
0.65	6.83
0.66	7.05
0.67	7.28
0.68	7.52
0.69	7.76
0.7	8
0.71	8.24
0.72	8.49
0.73	8.74
0.74	9
0.75	9.26
0.76	9.52
0.77	9.79
0.78	10.06
0.79	10.33
0.8	10.61
0.81	10.89

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

SEIMS Rating Table 03	
Water Level (ft)	Discharge (cfs)
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
0.9	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	17

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

COUMO Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.16	0.03
0.17	0.04
0.18	0.05
0.19	0.06
0.2	0.07
0.21	0.09
0.22	0.11
0.23	0.13
0.24	0.15
0.25	0.18
0.26	0.2
0.27	0.24
0.28	0.27
0.29	0.31
0.3	0.36
0.31	0.41
0.32	0.46
0.33	0.52
0.34	0.59
0.35	0.66
0.36	0.74
0.37	0.81
0.38	0.88
0.39	0.95
0.4	1.03
0.41	1.11
0.42	1.2
0.43	1.29
0.44	1.39
0.45	1.49
0.46	1.6
0.47	1.71
0.48	1.82
0.49	1.94
0.5	2.07
0.51	2.2
0.52	2.34
0.53	2.49

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

COUMO Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.54	2.64
0.55	2.79
0.56	2.95
0.57	3.12
0.58	3.3
0.59	3.48
0.6	3.67
0.61	3.86
0.62	4.06
0.63	4.27
0.64	4.49
0.65	4.71
0.66	4.94
0.67	5.18
0.68	5.43
0.69	5.68
0.7	5.94
0.71	6.21
0.72	6.49
0.73	6.78
0.74	7.08
0.75	7.38
0.76	7.69
0.77	8.01
0.78	8.34
0.79	8.68
0.8	9.03
0.81	9.39
0.82	9.76
0.83	10.14
0.84	10.52
0.85	10.92
0.86	11.33
0.87	11.75
0.88	12.18
0.89	12.62
0.9	13.06
0.91	13.52

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

COUMO Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.92	14
0.93	14.48
0.94	14.97
0.95	15.48
0.96	15.99
0.97	16.52
0.98	17.06
0.99	17.61
1	18.17
1.01	18.75
1.02	19.34
1.03	19.94
1.04	20.55
1.05	21.18
1.06	21.82
1.07	22.47
1.08	23.13
1.09	23.81
1.1	24.5

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

COUMI Rating Table DS 01	
Water Level (ft)	Discharge (cfs)
0.34	0.01
0.35	0.01
0.36	0.02
0.37	0.02
0.38	0.02
0.39	0.03
0.4	0.04
0.41	0.05
0.42	0.06
0.43	0.07
0.44	0.08
0.45	0.1
0.46	0.12
0.47	0.14
0.48	0.17
0.49	0.19
0.5	0.22
0.51	0.25
0.52	0.28
0.53	0.31
0.54	0.35
0.55	0.39
0.56	0.44
0.57	0.48
0.58	0.54
0.59	0.6
0.6	0.66
0.61	0.73
0.62	0.81
0.63	0.89
0.64	0.98
0.65	1.08
0.66	1.18
0.67	1.3
0.68	1.42
0.69	1.55
0.7	1.7
0.71	1.85

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

COUMI Rating Table DS 01	
Water Level (ft)	Discharge (cfs)
0.72	2.01
0.73	2.19
0.74	2.38
0.75	2.58
0.76	2.8
0.77	2.89
0.78	2.99
0.79	3.09
0.8	3.19
0.81	3.29
0.82	3.39
0.83	3.49
0.84	3.6
0.85	3.71
0.86	3.82
0.87	3.93
0.88	4.05
0.89	4.16
0.9	4.28
0.91	4.4
0.92	4.53
0.93	4.65
0.94	4.78
0.95	4.91
0.96	5.04
0.97	5.17
0.98	5.3
0.99	5.44
1	5.58
1.01	5.72
1.02	5.87
1.03	6.01
1.04	6.16
1.05	6.31
1.06	6.46
1.07	6.62
1.08	6.77
1.09	6.93

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

COUMI Rating Table DS 01	
Water Level (ft)	Discharge (cfs)
1.1	7.09
1.11	7.25
1.12	7.42
1.13	7.59
1.14	7.76
1.15	7.93
1.16	8.1
1.17	8.28
1.18	8.46
1.19	8.64
1.2	8.82
1.21	9.01
1.22	9.2
1.23	9.39
1.24	9.58
1.25	9.78
1.26	9.98
1.27	10.18
1.28	10.38
1.29	10.58
1.3	10.79
1.31	11
1.32	11.21
1.33	11.43
1.34	11.64
1.35	11.86
1.36	12.09
1.37	12.31
1.38	12.54
1.39	12.77
1.4	13

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

COUMI Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.12	0.01
0.13	0.01
0.14	0.02
0.15	0.03
0.16	0.04
0.17	0.04
0.18	0.05
0.19	0.06
0.2	0.08
0.21	0.09
0.22	0.1
0.23	0.12
0.24	0.13
0.25	0.15
0.26	0.17
0.27	0.2
0.28	0.22
0.29	0.25
0.3	0.27
0.31	0.3
0.32	0.34
0.33	0.37
0.34	0.41
0.35	0.45
0.36	0.49
0.37	0.54
0.38	0.58
0.39	0.63
0.4	0.69
0.41	0.74
0.42	0.8
0.43	0.87
0.44	0.93
0.45	1
0.46	1.07
0.47	1.15
0.48	1.26
0.49	1.37

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

COUMI Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.5	1.49
0.51	1.61
0.52	1.75
0.53	1.89
0.54	2.05
0.55	2.21
0.56	2.38
0.57	2.56
0.58	2.75
0.59	2.96
0.6	3.17
0.61	3.39
0.62	3.63
0.63	3.88
0.64	4.14
0.65	4.42
0.66	4.71
0.67	5.01
0.68	5.33
0.69	5.66
0.7	6.01
0.71	6.37
0.72	6.75
0.73	7.15
0.74	7.57
0.75	8

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

COUMI Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.07	0.02
0.08	0.03
0.09	0.03
0.1	0.04
0.11	0.05
0.12	0.06
0.13	0.07
0.14	0.08
0.15	0.09
0.16	0.11
0.17	0.12
0.18	0.13
0.19	0.15
0.2	0.16
0.21	0.18
0.22	0.2
0.23	0.22
0.24	0.24
0.25	0.26
0.26	0.28
0.27	0.3
0.28	0.34
0.29	0.39
0.3	0.44
0.31	0.49
0.32	0.55
0.33	0.62
0.34	0.69
0.35	0.77
0.36	0.85
0.37	0.94
0.38	1.03
0.39	1.13
0.4	1.24
0.41	1.36
0.42	1.48
0.43	1.61
0.44	1.75

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

COUMI Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.45	1.9
0.46	2.06
0.47	2.23
0.48	2.4
0.49	2.59
0.5	2.79
0.51	2.99
0.52	3.21
0.53	3.44
0.54	3.68
0.55	3.93
0.56	4.2
0.57	4.47
0.58	4.76
0.59	5.07
0.6	5.39
0.61	5.72
0.62	6.06
0.63	6.43
0.64	6.8
0.65	7.19
0.66	7.6
0.67	8.03
0.68	8.47
0.69	8.93
0.7	9.41
0.71	9.9
0.72	10.42
0.73	10.95
0.74	11.5

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

COUMI Rating Table 09	
Water Level (ft)	Discharge (cfs)
0.02	0.03
0.03	0.04
0.04	0.05
0.05	0.06
0.06	0.06
0.07	0.07
0.08	0.08
0.09	0.08
0.1	0.09
0.11	0.09
0.12	0.1
0.13	0.1
0.14	0.11
0.15	0.12
0.16	0.12
0.17	0.13
0.18	0.13
0.19	0.15
0.2	0.16
0.21	0.18
0.22	0.2
0.23	0.22
0.24	0.24
0.25	0.26
0.26	0.28
0.27	0.3
0.28	0.34
0.29	0.39
0.3	0.44
0.31	0.49
0.32	0.55
0.33	0.62
0.34	0.69
0.35	0.77
0.36	0.85
0.37	0.94
0.38	1.03
0.39	1.13

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

COUMI Rating Table 09	
Water Level (ft)	Discharge (cfs)
0.4	1.24
0.41	1.36
0.42	1.48
0.43	1.61
0.44	1.75
0.45	1.9
0.46	2.06
0.47	2.23
0.48	2.4
0.49	2.59
0.5	2.79
0.51	2.99
0.52	3.21
0.53	3.44
0.54	3.68
0.55	3.93
0.56	4.2
0.57	4.47
0.58	4.76
0.59	5.07
0.6	5.39
0.61	5.72
0.62	6.06
0.63	6.43
0.64	6.8
0.65	7.19
0.66	7.6
0.67	8.03
0.68	8.47
0.69	8.93
0.7	9.41
0.71	9.9
0.72	10.42
0.73	10.95
0.74	11.5

Table C-13. Rating Tables 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
0.1	0.28
0.11	0.33
0.12	0.39
0.13	0.46
0.14	0.53
0.15	0.6
0.16	0.69
0.17	0.78
0.18	0.88
0.19	0.99
0.2	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
0.3	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

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

TYLMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.39	4.58
0.4	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
0.49	7.44
0.5	7.77
0.51	8.1
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
0.6	11.45
0.61	11.86
0.62	12.27
0.63	12.7
0.64	13.13
0.65	13.57
0.66	14.02
0.67	14.47
0.68	14.94
0.69	15.41
0.7	15.89
0.71	16.37
0.72	16.87
0.73	17.37
0.74	17.88
0.75	18.4
0.76	18.93

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

TYLMO Rating Table 04	
Water Level (ft)	Discharge (cfs)
0.77	19.46
0.78	20

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

TYLMO Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.06	0.01
0.07	0.02
0.08	0.02
0.09	0.04
0.1	0.05
0.11	0.07
0.12	0.09
0.13	0.11
0.14	0.14
0.15	0.18
0.16	0.21
0.17	0.26
0.18	0.31
0.19	0.37
0.2	0.43
0.21	0.5
0.22	0.58
0.23	0.67
0.24	0.76
0.25	0.87
0.26	0.98
0.27	1.1
0.28	1.23
0.29	1.38
0.3	1.53
0.31	1.7
0.32	1.87
0.33	2.06
0.34	2.26
0.35	2.48
0.36	2.71
0.37	2.95
0.38	3.2
0.39	3.48
0.4	3.76
0.41	4.06
0.42	4.38
0.43	4.72

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

TYLMO Rating Table 05	
Water Level (ft)	Discharge (cfs)
0.44	5.07
0.45	5.44
0.46	5.82
0.47	6.23
0.48	6.65
0.49	7.09
0.5	7.56
0.51	8.04
0.52	8.54
0.53	9.07
0.54	9.61
0.55	10.18
0.56	10.77
0.57	11.38
0.58	12.02
0.59	12.68
0.6	13.36
0.61	14.07
0.62	14.8
0.63	15.56
0.64	16.35
0.65	17.16
0.66	18

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

TYLMO Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.06	0.01
0.07	0.02
0.08	0.02
0.09	0.04
0.1	0.05
0.11	0.07
0.12	0.09
0.13	0.11
0.14	0.14
0.15	0.17
0.16	0.21
0.17	0.26
0.18	0.31
0.19	0.36
0.2	0.43
0.21	0.5
0.22	0.57
0.23	0.66
0.24	0.75
0.25	0.86
0.26	0.97
0.27	1.09
0.28	1.22
0.29	1.36
0.3	1.51
0.31	1.67
0.32	1.85
0.33	2.03
0.34	2.23
0.35	2.44
0.36	2.67
0.37	2.91
0.38	3.16
0.39	3.42
0.4	3.71
0.41	4
0.42	4.31
0.43	4.64

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

TYLMO Rating Table 06	
Water Level (ft)	Discharge (cfs)
0.44	4.99
0.45	5.35
0.46	5.73
0.47	6.13
0.48	6.54
0.49	6.98
0.5	7.43
0.51	7.9
0.52	8.4
0.53	8.91
0.54	9.44
0.55	10
0.56	10.2
0.57	10.39
0.58	10.59
0.59	10.79
0.6	10.99
0.61	11.19
0.62	11.38
0.63	11.58
0.64	11.78
0.65	11.98
0.66	12.18
0.67	12.38
0.68	12.58
0.69	12.78
0.7	12.98
0.71	13.18
0.72	13.38
0.73	13.58
0.74	13.79
0.75	13.99
0.76	14.19
0.77	14.39
0.78	14.59
0.79	14.8
0.8	15

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

TYLMI Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.07	0.01
0.08	0.02
0.09	0.02
0.1	0.03
0.11	0.04
0.12	0.06
0.13	0.07
0.14	0.1
0.15	0.12
0.16	0.15
0.17	0.19
0.18	0.23
0.19	0.28
0.2	0.33
0.21	0.4
0.22	0.47
0.23	0.54
0.24	0.63
0.25	0.68
0.26	0.74
0.27	0.8
0.28	0.86
0.29	0.92
0.3	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	1.5
0.38	1.58
0.39	1.67
0.4	1.76
0.41	1.85
0.42	1.94
0.43	2.03
0.44	2.13

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

TYLMI Rating Table 07	
Water Level (ft)	Discharge (cfs)
0.45	2.22
0.46	2.33
0.47	2.43
0.48	2.53
0.49	2.64
0.5	2.75
0.51	2.86
0.52	2.97
0.53	3.09
0.54	3.21
0.55	3.33
0.56	3.45
0.57	3.58
0.58	3.7
0.59	3.83
0.6	3.96
0.61	4.1
0.62	4.23
0.63	4.37
0.64	4.51
0.65	4.65
0.66	4.8
0.67	4.95
0.68	5.09
0.69	5.25
0.7	5.4
0.71	5.56
0.72	5.73
0.73	5.9
0.74	6.08
0.75	6.25
0.76	6.43
0.77	6.61
0.78	6.79
0.79	6.98
0.8	7.17
0.81	7.36
0.82	7.55

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

TYLMI Rating Table 07	
Water Level (ft)	Discharge (cfs)
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
0.9	9.2

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

TYLMI Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.12	0.01
0.13	0.01
0.14	0.01
0.15	0.01
0.16	0.01
0.17	0.01
0.18	0.01
0.19	0.01
0.2	0.01
0.21	0.01
0.22	0.01
0.23	0.01
0.24	0.01
0.25	0.02
0.26	0.03
0.27	0.04
0.28	0.07
0.29	0.1
0.3	0.15
0.31	0.23
0.32	0.27
0.33	0.32
0.34	0.38
0.35	0.44
0.36	0.52
0.37	0.6
0.38	0.69
0.39	0.8
0.4	0.92
0.41	1.05
0.42	1.12
0.43	1.18
0.44	1.26
0.45	1.33
0.46	1.4
0.47	1.48
0.48	1.56
0.49	1.65

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

TYLMI Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.5	1.73
0.51	1.82
0.52	1.91
0.53	2.01
0.54	2.11
0.55	2.21
0.56	2.31
0.57	2.41
0.58	2.52
0.59	2.63
0.6	2.75
0.61	2.87
0.62	2.99
0.63	3.11
0.64	3.24
0.65	3.37
0.66	3.5
0.67	3.63
0.68	3.77
0.69	3.91
0.7	4.06
0.71	4.21
0.72	4.36
0.73	4.51
0.74	4.67
0.75	4.83
0.76	5
0.77	5.16
0.78	5.34
0.79	5.51
0.8	5.69
0.81	5.87
0.82	6.06
0.83	6.24
0.84	6.44
0.85	6.63
0.86	6.83
0.87	7.03

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

TYLMI Rating Table 08	
Water Level (ft)	Discharge (cfs)
0.88	7.24
0.89	7.45
0.9	7.66
0.91	7.88
0.92	8.1
0.93	8.32
0.94	8.55
0.95	8.78
0.96	9.02
0.97	9.26
0.98	9.5
0.99	9.75
1	10

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 ($feet^3$)
10/3/2019 1:35	10/3/2019 4:05	2.5	0.05	0.02	0.12	96.6	10/3/2019 1:30	10/3/2019 16:05	14.7	1.16	1.22	61,098
10/4/2019 2:30	10/4/2019 4:05	1.6	0.05	0.03	0.12	24.5	10/4/2019 2:25	10/4/2019 16:05	13.8	1.13	1.22	56,106
10/7/2019 18:55	10/8/2019 16:15	21.3	0.78	0.04	0.72	88.2	10/7/2019 18:55	10/9/2019 4:15	33.4	1.71	2.48	205,719
10/16/2019 5:15	10/16/2019 9:35	4.3	0.16	0.04	0.12	186.2	10/16/2019 5:10	10/16/2019 15:40	10.6	1.03	1.08	39,237
10/16/2019 15:40	10/16/2019 20:30	4.8	0.36	0.07	0.48	6.7	10/16/2019 15:40	10/17/2019 7:35	16.0	1.52	1.89	87,741
10/17/2019 7:35	10/17/2019 17:10	9.6	0.10	0.01	0.24	11.3	10/17/2019 7:35	10/18/2019 5:10	21.7	1.17	1.22	91,008
10/18/2019 14:50	10/19/2019 12:30	21.7	1.12	0.05	0.36	25.0	10/18/2019 14:45	10/20/2019 0:30	33.8	2.50	3.65	304,734
10/20/2019 7:10	10/20/2019 22:25	15.3	0.68	0.04	0.84	19.9	10/20/2019 7:05	10/21/2019 7:25	24.4	2.34	5.03	205,308
10/21/2019 7:25	10/22/2019 6:25	23.0	1.05	0.05	0.24	9.2	10/21/2019 7:25	10/22/2019 18:20	35.0	3.70	6.63	466,489
10/25/2019 9:35	10/25/2019 20:55	11.3	0.34	0.03	0.24	77.3	10/25/2019 9:30	10/26/2019 8:55	23.5	1.64	2.27	138,699
11/9/2019 0:40	11/9/2019 16:20	15.7	0.35	0.02	0.24	339.8	11/9/2019 0:40	11/10/2019 4:15	27.7	1.25	1.54	124,017
11/12/2019 4:00	11/12/2019 7:50	3.8	0.32	0.08	0.24	60.4	11/12/2019 3:55	11/12/2019 19:50	16.0	1.54	1.89	88,926
11/15/2019 3:40	11/15/2019 5:30	1.8	0.23	0.13	0.24	68.4	11/15/2019 3:40	11/15/2019 17:25	13.8	1.44	1.71	71,868
11/15/2019 18:10	11/15/2019 19:25	1.3	0.12	0.10	0.36	13.2	11/15/2019 18:10	11/16/2019 7:25	13.3	1.33	1.38	63,840
11/16/2019 14:35	11/16/2019 23:00	8.4	0.08	0.01	0.12	19.8	11/16/2019 14:35	11/16/2019 23:25	8.9	1.26	1.38	40,314
11/16/2019 23:30	11/17/2019 20:35	21.1	0.46	0.02	0.24	8.8	11/16/2019 23:25	11/18/2019 8:35	33.3	1.69	2.27	201,939
11/18/2019 11:45	11/19/2019 8:55	21.2	0.69	0.03	0.48	16.2	11/18/2019 11:45	11/19/2019 20:55	33.3	2.56	3.65	306,685
11/23/2019 23:55	11/24/2019 2:20	2.4	0.15	0.06	0.24	112.7	11/23/2019 23:55	11/24/2019 14:15	14.4	1.42	1.54	73,446
11/24/2019 21:50	11/25/2019 7:55	10.1	0.40	0.04	0.36	19.8	11/24/2019 21:50	11/25/2019 14:00	16.3	1.90	2.48	110,868
11/25/2019 14:00	11/25/2019 22:55	8.9	0.25	0.03	0.24	6.3	11/25/2019 14:00	11/26/2019 10:50	20.9	2.00	2.48	150,303
12/1/2019 11:30	12/1/2019 12:10	0.7	0.03	0.05	0.12	133.8	12/1/2019 11:30	12/2/2019 0:10	12.8	1.38	1.38	63,342
12/4/2019 6:30	12/4/2019 7:50	1.3	0.03	0.02	0.12	200.8	12/4/2019 6:30	12/4/2019 19:50	13.4	1.38	1.38	66,654
12/7/2019 0:25	12/7/2019 16:45	16.3	0.44	0.03	0.12	266.8	12/7/2019 0:20	12/8/2019 4:40	28.4	1.77	2.48	181,203
12/10/2019 6:50	12/10/2019 23:30	16.7	0.28	0.02	0.12	72.2	12/10/2019 6:45	12/11/2019 9:50	27.2	1.61	1.89	157,929
12/11/2019 9:50	12/12/2019 14:40	28.8	0.49	0.02	0.24	14.2	12/11/2019 9:50	12/13/2019 2:35	40.8	2.00	2.48	294,148
12/13/2019 15:50	12/14/2019 14:05	22.3	0.36	0.02	0.36	25.4	12/13/2019 15:45	12/14/2019 15:30	23.8	1.86	2.08	159,693
12/14/2019 15:35	12/14/2019 21:30	5.9	0.06	0.01	0.12	7.5	12/14/2019 15:30	12/15/2019 0:55	9.5	1.89	2.08	64,695
12/15/2019 0:55	12/15/2019 7:25	6.5	0.06	0.01	0.12	7.8	12/15/2019 0:55	12/15/2019 13:15	12.4	1.64	1.89	73,311
12/15/2019 13:15	12/15/2019 13:50	0.6	0.04	0.07	0.24	9.1	12/15/2019 13:15	12/16/2019 1:50	12.7	1.54	1.71	70,050
12/18/2019 18:15	12/19/2019 2:35	8.3	0.35	0.04	0.12	77.0	12/18/2019 18:10	12/19/2019 12:00	17.9	1.78	2.27	114,675
12/19/2019 12:05	12/21/2019 14:25	50.3	5.37	0.11	0.72	10.9	12/19/2019 12:00	12/22/2019 2:25	62.5	9.93	24.75	2,233,332
12/22/2019 16:05	12/23/2019 4:00	11.9	0.26	0.02	0.12	27.2	12/22/2019 16:05	12/23/2019 16:00	24.0	3.32	3.65	286,802
12/26/2019 23:00	12/27/2019 0:50	1.8	0.03	0.02	0.12	92.5	12/26/2019 23:00	12/27/2019 12:45	13.8	1.89	1.89	94,122
12/30/2019 4:55	12/30/2019 8:20	3.4	0.07	0.02	0.12	170.4	12/30/2019 4:50	12/30/2019 20:15	15.5	1.57	1.71	87,717
12/31/2019 2:50	12/31/2019 13:15	10.4	0.04	0.00	0.12	19.9	12/31/2019 2:45	12/31/2019 14:55	12.3	1.54	1.54	67,914
12/31/2019 15:00	12/31/2019 15:25	0.4	0.04	0.10	0.12	32.1	12/31/2019 14:55	1/1/2020 2:25	10.6	1.62	1.71	61,683
1/1/2020 2:25	1/1/2020 8:20	5.9	0.47	0.08	0.72	11.4	1/1/2020 2:25	1/1/2020 19:40	17.3	2.24	3.40	139,932
1/1/2020 19:40	1/2/2020 4:30	8.8	0.65	0.07	0.48	11.9	1/1/2020 19:40	1/2/2020 11:35	16.0	3.50	4.17	201,693
1/2/2020 11:35	1/2/2020 20:05	8.5	0.11	0.01	0.12	9.8	1/2/2020 11:35	1/3/2020 8:05	20.6	2.47	2.70	182,667
1/3/2020 20:20	1/4/2020 3:15	6.9	0.26	0.04	0.12	29.2	1/3/2020 20:15	1/4/2020 15:10	19.0	2.32	2.92	159,003
1/5/2020 3:35	1/5/2020 15:05	11.5	0.26	0.02	0.24	27.2	1/5/2020 3:30	1/6/2020 2:00	22.6	2.09	2.48	169,881
1/6/2020 2:00	1/6/2020 7:35	5.6	0.03	0.01	0.12	14.7	1/6/2020 2:00	1/6/2020 18:55	17.0	1.89	2.08	115,725
1/6/2020 18:55	1/7/2020 10:05	15.2	0.42	0.03	0.12	31.6	1/6/2020 18:55	1/7/2020 15:55	21.1	2.41	2.92	182,917
1/7/2020 15:55	1/7/2020 21:00	5.1	0.16	0.03	0.36	10.2	1/7/2020 15:55	1/8/2020 8:55	17.1	2.32	2.70	142,560
1/8/2020 18:30	1/8/2020 19:20	0.8	0.03	0.04	0.12	22.4	1/8/2020 18:30	1/9/2020 7:15	12.8	1.89	1.89	87,318
1/9/2020 9:45	1/9/2020 11:00	1.3	0.07	0.06	0.12	37.7	1/9/2020 9:40	1/9/2020 23:00	13.4	1.89	1.89	91,287

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 ($feet^3$)
1/10/2020 4:50	1/10/2020 22:45	17.9	0.44	0.02	0.24	18.1	1/10/2020 4:50	1/11/2020 3:55	23.2	2.28	2.70	190,500
1/11/2020 3:55	1/11/2020 19:30	15.6	0.71	0.05	0.36	7.6	1/11/2020 3:55	1/11/2020 21:25	17.6	3.57	5.33	226,266
1/11/2020 21:25	1/12/2020 4:25	7.0	0.06	0.01	0.12	7.7	1/11/2020 21:25	1/12/2020 10:15	12.9	2.97	3.40	137,904
1/12/2020 10:15	1/12/2020 20:25	10.2	0.16	0.02	0.12	11.8	1/12/2020 10:15	1/13/2020 8:25	22.3	2.92	3.16	233,976
1/15/2020 13:50	1/16/2020 18:20	28.5	0.38	0.01	0.12	66.9	1/15/2020 13:50	1/17/2020 6:20	40.6	2.07	2.27	302,977
1/17/2020 10:50	1/17/2020 15:20	4.5	0.18	0.04	0.12	20.0	1/17/2020 10:50	1/18/2020 1:40	14.9	1.89	2.08	101,664
1/18/2020 1:40	1/18/2020 9:00	7.3	0.39	0.05	0.24	10.8	1/18/2020 1:40	1/18/2020 20:55	19.3	2.92	3.65	202,956
1/21/2020 3:45	1/21/2020 22:50	19.1	0.68	0.04	0.24	68.2	1/21/2020 3:40	1/22/2020 8:35	29.0	2.50	3.65	261,387
1/22/2020 8:40	1/25/2020 13:45	77.1	2.00	0.03	1.20	10.7	1/22/2020 8:35	1/26/2020 1:15	88.8	3.73	5.33	1,192,149
1/26/2020 1:20	1/26/2020 11:00	9.7	0.35	0.04	0.36	19.5	1/26/2020 1:15	1/26/2020 19:25	18.3	3.57	4.17	234,867
1/26/2020 19:30	1/26/2020 21:10	1.7	0.03	0.02	0.12	11.3	1/26/2020 19:25	1/27/2020 9:10	13.8	2.95	3.16	146,982
1/27/2020 17:10	1/28/2020 9:55	16.8	1.04	0.06	0.36	33.0	1/27/2020 17:10	1/28/2020 19:15	26.2	4.42	5.96	416,560
1/28/2020 19:20	1/28/2020 20:10	0.8	0.03	0.04	0.12	10.2	1/28/2020 19:15	1/29/2020 8:10	13.0	3.39	3.91	158,436
1/29/2020 9:35	1/29/2020 16:50	7.3	0.09	0.01	0.12	24.5	1/29/2020 9:35	1/30/2020 4:50	19.3	2.90	3.16	201,991
1/30/2020 17:05	2/2/2020 1:15	56.2	1.49	0.03	0.36	29.8	1/30/2020 17:00	2/2/2020 13:15	68.3	3.48	5.96	855,343
2/3/2020 0:15	2/3/2020 4:00	3.8	0.08	0.02	0.12	27.8	2/3/2020 0:15	2/3/2020 15:55	15.8	2.81	2.92	159,096
2/4/2020 11:50	2/7/2020 13:05	73.3	5.33	0.07	0.36	33.8	2/4/2020 11:50	2/7/2020 17:10	77.4	11.62	23.44	3,239,122
2/7/2020 17:15	2/7/2020 19:00	1.8	0.17	0.10	0.36	9.8	2/7/2020 17:10	2/8/2020 3:55	10.8	5.64	6.44	220,128
2/8/2020 3:55	2/8/2020 13:55	10.0	0.23	0.02	0.36	9.0	2/8/2020 3:55	2/9/2020 1:50	22.0	4.43	5.45	351,225
2/11/2020 23:30	2/11/2020 23:45	0.3	0.07	0.28	0.48	84.4	2/11/2020 23:30	2/12/2020 11:45	12.3	2.08	2.16	92,178
2/13/2020 9:30	2/13/2020 10:45	1.3	0.03	0.02	0.12	34.0	2/13/2020 9:30	2/13/2020 16:15	6.8	1.87	1.98	46,062
2/13/2020 16:15	2/13/2020 23:20	7.1	0.21	0.03	0.48	40.8	2/13/2020 16:15	2/14/2020 11:15	19.1	2.21	2.56	151,626
2/14/2020 21:25	2/15/2020 0:50	3.4	0.08	0.02	0.12	26.2	2/14/2020 21:20	2/15/2020 12:45	15.5	1.93	2.16	107,784
2/15/2020 18:10	2/16/2020 0:40	6.5	0.32	0.05	0.24	18.6	2/15/2020 18:10	2/16/2020 12:40	18.6	2.33	3.23	155,748
2/16/2020 15:20	2/16/2020 23:40	8.3	0.13	0.02	0.24	15.8	2/16/2020 15:20	2/17/2020 11:35	20.3	1.97	2.16	144,342
2/23/2020 5:15	2/23/2020 7:50	2.6	0.14	0.05	0.36	156.8	2/23/2020 5:10	2/23/2020 19:50	14.8	1.59	1.72	84,468
2/26/2020 3:30	2/26/2020 6:05	2.6	0.03	0.01	0.12	68.1	2/26/2020 3:30	2/26/2020 18:00	14.6	1.48	1.48	77,700
2/28/2020 16:55	2/28/2020 22:25	5.5	0.10	0.02	0.12	129.5	2/28/2020 16:55	2/29/2020 10:25	17.6	1.50	1.56	95,220
3/1/2020 18:45	3/1/2020 22:00	3.3	0.07	0.02	0.12	48.9	3/1/2020 18:40	3/2/2020 4:15	9.7	1.54	1.56	53,568
3/2/2020 4:20	3/3/2020 7:00	26.7	0.44	0.02	0.12	6.9	3/2/2020 4:15	3/3/2020 16:05	35.9	1.76	2.36	227,885
3/3/2020 16:10	3/3/2020 16:30	0.3	0.05	0.15	0.24	12.2	3/3/2020 16:05	3/4/2020 1:25	9.4	1.67	1.72	56,628
3/4/2020 1:30	3/4/2020 5:50	4.3	0.08	0.02	0.12	9.2	3/4/2020 1:25	3/4/2020 17:45	16.4	1.62	1.64	95,868
3/5/2020 21:00	3/6/2020 12:45	15.8	0.76	0.05	0.24	39.6	3/5/2020 20:55	3/7/2020 0:40	27.8	2.50	3.48	250,881
3/7/2020 11:50	3/7/2020 13:05	1.3	0.11	0.09	0.36	24.6	3/7/2020 11:45	3/7/2020 21:10	9.5	1.84	1.98	62,886
3/7/2020 21:10	3/8/2020 0:35	3.4	0.10	0.03	0.12	8.2	3/7/2020 21:10	3/8/2020 12:30	15.4	1.75	1.80	97,308
3/11/2020 4:25	3/11/2020 5:15	0.8	0.05	0.06	0.12	76.5	3/11/2020 4:25	3/11/2020 17:10	12.8	1.56	1.64	72,168
3/13/2020 5:20	3/13/2020 18:20	13.0	0.35	0.03	0.12	48.5	3/13/2020 5:15	3/14/2020 6:20	25.2	1.70	1.98	153,792
3/25/2020 1:00	3/25/2020 13:25	12.4	0.14	0.01	0.24	271.7	3/25/2020 0:55	3/26/2020 1:25	24.6	1.56	1.64	137,652
3/27/2020 6:15	3/27/2020 9:10	2.9	0.03	0.01	0.12	41.1	3/27/2020 6:10	3/27/2020 21:10	15.1	1.56	1.56	84,660
3/28/2020 1:55	3/28/2020 4:45	2.8	0.05	0.02	0.12	60.8	3/28/2020 1:50	3/28/2020 10:40	8.9	1.56	1.56	50,028
3/28/2020 10:40	3/29/2020 5:45	19.1	0.64	0.03	0.24	7.8	3/28/2020 10:40	3/29/2020 17:45	31.2	2.05	3.73	229,955
3/29/2020 19:55	3/30/2020 5:05	9.2	0.33	0.04	0.48	15.4	3/29/2020 19:50	3/30/2020 12:10	16.4	2.08	3.00	122,700
3/30/2020 12:15	3/31/2020 5:50	17.6	0.29	0.02	0.36	7.5	3/30/2020 12:10	3/31/2020 17:45	29.7	1.95	2.36	208,440
3/31/2020 17:50	3/31/2020 21:00	3.2	0.05	0.02	0.12	19.2	3/31/2020 17:45	4/1/2020 7:35	13.9	1.66	1.72	82,980
4/1/2020 7:35	4/1/2020 15:20	7.8	0.08	0.01	0.24	13.7	4/1/2020 7:35	4/2/2020 3:20	19.8	1.65	1.72	117,816
4/3/2020 15:05	4/3/2020 20:40	5.6	0.14	0.03	0.12	51.1	4/3/2020 15:00	4/4/2020 8:35	17.7	1.60	1.72	102,048
4/11/2020 11:25	4/11/2020 12:25	1.0	0.04	0.04	0.24	183.7	4/11/2020 11:25	4/12/2020 0:20	13.0	1.40	1.48	65,664

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 ($feet^3$)
4/18/2020 9:35	4/18/2020 9:55	0.3	0.03	0.09	0.12	166.2	4/18/2020 9:30	4/18/2020 21:55	12.5	1.40	1.48	62,880
4/22/2020 5:25	4/23/2020 8:55	27.5	1.12	0.04	0.24	258.0	4/22/2020 5:25	4/23/2020 16:05	34.8	2.37	4.26	296,603
4/23/2020 16:10	4/23/2020 22:30	6.3	0.10	0.02	0.12	12.5	4/23/2020 16:05	4/24/2020 10:25	18.4	1.66	1.80	110,244
4/25/2020 6:20	4/25/2020 10:45	4.4	0.37	0.08	0.48	35.0	4/25/2020 6:20	4/25/2020 22:45	16.5	1.97	3.00	116,862
4/26/2020 22:05	4/27/2020 1:45	3.7	0.11	0.03	0.12	36.1	4/26/2020 22:05	4/27/2020 13:40	15.7	1.51	1.56	85,128
4/29/2020 19:00	4/29/2020 19:45	0.8	0.04	0.05	0.12	65.5	4/29/2020 18:55	4/30/2020 7:40	12.8	1.32	1.40	61,104
5/2/2020 3:20	5/2/2020 6:35	3.3	0.12	0.04	0.36	56.3	5/2/2020 3:20	5/2/2020 10:40	7.4	1.44	1.48	38,340
5/2/2020 10:40	5/2/2020 18:55	8.3	0.41	0.05	0.48	7.0	5/2/2020 10:40	5/3/2020 6:55	20.3	1.78	2.56	130,254
5/5/2020 19:35	5/6/2020 12:35	17.0	0.38	0.02	1.32	76.8	5/5/2020 19:30	5/7/2020 0:30	29.1	1.49	2.36	156,156
5/11/2020 18:45	5/11/2020 22:15	3.5	0.07	0.02	0.12	130.4	5/11/2020 18:45	5/12/2020 10:15	15.6	1.25	1.32	70,068
5/13/2020 2:15	5/13/2020 6:20	4.1	0.06	0.01	0.12	29.7	5/13/2020 2:10	5/13/2020 18:20	16.3	1.27	1.32	74,196
5/14/2020 4:30	5/14/2020 8:30	4.0	0.18	0.05	0.36	24.3	5/14/2020 4:25	5/14/2020 20:25	16.1	1.38	1.56	79,956
5/14/2020 23:00	5/15/2020 3:40	4.7	0.03	0.01	0.12	15.4	5/14/2020 23:00	5/15/2020 15:40	16.8	1.31	1.32	78,708
5/16/2020 13:20	5/17/2020 4:15	14.9	0.73	0.05	0.48	53.8	5/16/2020 13:20	5/17/2020 16:15	27.0	1.91	3.48	185,496
5/20/2020 16:15	5/20/2020 19:30	3.3	0.09	0.03	0.12	86.7	5/20/2020 16:15	5/21/2020 1:50	9.7	1.45	1.48	50,592
5/21/2020 1:55	5/21/2020 17:35	15.7	1.27	0.08	0.48	8.9	5/21/2020 1:50	5/22/2020 5:35	27.8	3.59	5.77	360,150
5/22/2020 16:05	5/23/2020 3:20	11.3	0.18	0.02	0.12	22.8	5/22/2020 16:05	5/23/2020 15:20	23.3	1.82	1.98	152,772
5/25/2020 4:10	5/25/2020 17:45	13.6	0.32	0.02	0.12	49.6	5/25/2020 4:05	5/26/2020 5:45	25.8	1.77	2.16	163,884
5/30/2020 7:10	5/31/2020 11:05	27.9	1.49	0.05	0.72	114.4	5/30/2020 7:05	5/31/2020 23:00	40.0	3.30	7.53	475,177
6/5/2020 19:40	6/5/2020 20:40	1.0	0.04	0.04	0.12	133.2	6/5/2020 19:40	6/6/2020 8:35	13.0	1.32	1.32	61,656
6/6/2020 13:50	6/6/2020 13:55	0.1	0.03	0.36	0.24	18.2	6/6/2020 13:50	6/6/2020 22:50	9.1	1.24	1.24	40,548
6/6/2020 22:50	6/7/2020 11:00	12.2	0.58	0.05	0.24	27.2	6/6/2020 22:50	6/7/2020 19:50	21.1	1.77	2.56	134,406
6/7/2020 19:50	6/7/2020 20:20	0.5	0.17	0.34	1.56	12.3	6/7/2020 19:50	6/8/2020 8:15	12.5	1.78	2.56	80,232
6/9/2020 0:40	6/9/2020 12:45	12.1	0.32	0.03	0.12	28.8	6/9/2020 0:40	6/9/2020 18:40	18.1	1.61	1.80	104,580
6/9/2020 18:45	6/9/2020 20:25	1.7	0.05	0.03	0.12	8.5	6/9/2020 18:40	6/10/2020 8:25	13.8	1.57	1.64	78,384
6/11/2020 7:10	6/11/2020 12:25	5.3	0.20	0.04	0.24	36.4	6/11/2020 7:10	6/12/2020 0:20	17.3	1.51	1.72	93,684
6/12/2020 12:05	6/12/2020 14:55	2.8	0.25	0.09	0.24	24.8	6/12/2020 12:00	6/12/2020 21:30	9.6	1.72	1.98	59,436
6/12/2020 21:30	6/13/2020 2:25	4.9	0.11	0.02	0.36	6.9	6/12/2020 21:30	6/13/2020 14:25	17.0	1.60	1.80	98,136
6/13/2020 20:55	6/14/2020 0:40	3.8	0.63	0.17	1.32	20.9	6/13/2020 20:55	6/14/2020 12:40	15.8	3.13	5.77	178,149
6/15/2020 4:50	6/15/2020 14:30	9.7	0.20	0.02	0.12	30.7	6/15/2020 4:50	6/16/2020 2:25	21.7	1.68	1.80	130,704
6/16/2020 3:10	6/16/2020 13:15	10.1	0.07	0.01	0.12	17.1	6/16/2020 3:10	6/17/2020 1:15	22.2	1.53	1.64	122,088
6/21/2020 5:20	6/21/2020 5:55	0.6	0.05	0.09	0.24	117.5	6/21/2020 5:15	6/21/2020 17:55	12.8	1.36	1.40	62,196
6/27/2020 10:30	6/28/2020 6:40	20.2	0.71	0.04	0.24	149.1	6/27/2020 10:25	6/28/2020 18:40	32.3	1.76	3.23	204,597
7/12/2020 4:10	7/12/2020 9:10	5.0	0.09	0.02	0.12	335.7	7/12/2020 4:10	7/12/2020 21:10	17.1	1.32	1.40	80,892
7/22/2020 5:00	7/22/2020 8:55	3.9	0.05	0.01	0.12	239.8	7/22/2020 5:00	7/22/2020 20:55	16.0	1.24	1.24	71,376
8/6/2020 7:15	8/6/2020 15:00	7.8	0.50	0.06	0.72	361.8	8/6/2020 7:15	8/7/2020 2:55	19.8	1.55	2.36	110,394
8/8/2020 4:30	8/8/2020 10:15	5.8	0.08	0.01	0.12	42.8	8/8/2020 4:25	8/8/2020 22:15	17.9	1.28	1.32	82,284
8/20/2020 19:50	8/21/2020 0:50	5.0	0.12	0.02	0.36	300.3	8/20/2020 19:50	8/21/2020 6:55	11.2	1.22	1.32	49,164
8/21/2020 6:55	8/21/2020 10:30	3.6	0.04	0.01	0.24	7.6	8/21/2020 6:55	8/21/2020 16:50	10.0	1.25	1.32	44,976

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 ($feet^3$)
10/3/2019 1:35	10/3/2019 4:05	2.5	0.05	0.02	0.12	96.6	10/3/2019 1:30	10/3/2019 16:05	14.7	0.58	0.67	30,666
10/4/2019 2:30	10/4/2019 4:05	1.6	0.05	0.03	0.12	24.5	10/4/2019 2:25	10/4/2019 16:05	13.8	0.57	0.57	28,215
10/7/2019 18:55	10/8/2019 16:15	21.3	0.78	0.04	0.72	88.2	10/7/2019 18:55	10/9/2019 4:15	33.4	0.57	0.79	68,127
10/16/2019 5:15	10/16/2019 9:35	4.3	0.16	0.04	0.12	186.2	10/16/2019 5:10	10/16/2019 15:40	10.6	0.56	0.67	21,447
10/16/2019 15:40	10/16/2019 20:30	4.8	0.36	0.07	0.48	6.7	10/16/2019 15:40	10/17/2019 7:35	16.0	0.83	1.06	47,787
10/17/2019 7:35	10/17/2019 17:10	9.6	0.10	0.01	0.24	11.3	10/17/2019 7:35	10/18/2019 5:10	21.7	0.59	0.79	46,332
10/18/2019 14:50	10/19/2019 12:30	21.7	1.12	0.05	0.36	25.0	10/18/2019 14:45	10/20/2019 0:30	33.8	0.99	1.74	121,056
10/20/2019 7:10	10/20/2019 22:25	15.3	0.68	0.04	0.84	19.9	10/20/2019 7:05	10/21/2019 7:25	24.4	0.80	1.90	70,497
10/21/2019 7:25	10/22/2019 6:25	23.0	1.05	0.05	0.24	9.2	10/21/2019 7:25	10/22/2019 18:20	35.0	1.26	2.40	158,463
10/25/2019 9:35	10/25/2019 20:55	11.3	0.34	0.03	0.24	77.3	10/25/2019 9:30	10/26/2019 8:55	23.5	0.66	1.06	55,878
11/9/2019 0:40	11/9/2019 16:20	15.7	0.35	0.02	0.24	339.8	11/9/2019 0:40	11/10/2019 4:15	27.7	0.31	0.39	30,600
11/12/2019 4:00	11/12/2019 7:50	3.8	0.32	0.08	0.24	60.4	11/12/2019 3:55	11/12/2019 19:50	16.0	0.35	0.47	20,055
11/15/2019 3:40	11/15/2019 5:30	1.8	0.23	0.13	0.24	68.4	11/15/2019 3:40	11/15/2019 17:25	13.8	0.37	0.39	18,462
11/15/2019 18:10	11/15/2019 19:25	1.3	0.12	0.10	0.36	13.2	11/15/2019 18:10	11/16/2019 7:25	13.3	0.38	0.39	18,447
11/16/2019 14:35	11/16/2019 23:00	8.4	0.08	0.01	0.12	19.8	11/16/2019 14:35	11/16/2019 23:25	8.9	0.37	0.39	11,889
11/16/2019 23:30	11/17/2019 20:35	21.1	0.46	0.02	0.24	8.8	11/16/2019 23:25	11/18/2019 8:35	33.3	0.47	0.67	55,791
11/18/2019 11:45	11/19/2019 8:55	21.2	0.69	0.03	0.48	16.2	11/18/2019 11:45	11/19/2019 20:55	33.3	0.82	1.40	98,523
11/23/2019 23:55	11/24/2019 2:20	2.4	0.15	0.06	0.24	112.7	11/23/2019 23:55	11/24/2019 14:15	14.4	0.41	0.47	21,180
11/24/2019 21:50	11/25/2019 7:55	10.1	0.40	0.04	0.36	19.8	11/24/2019 21:50	11/25/2019 14:00	16.3	0.58	0.79	33,831
11/25/2019 14:00	11/25/2019 22:55	8.9	0.25	0.03	0.24	6.3	11/25/2019 14:00	11/26/2019 10:50	20.9	0.57	0.67	42,981
12/1/2019 11:30	12/1/2019 12:10	0.7	0.03	0.05	0.12	133.8	12/1/2019 11:30	12/2/2019 0:10	12.8	0.38	0.47	17,490
12/4/2019 6:30	12/4/2019 7:50	1.3	0.03	0.02	0.12	200.8	12/4/2019 6:30	12/4/2019 19:50	13.4	0.32	0.39	15,498
12/7/2019 0:25	12/7/2019 16:45	16.3	0.44	0.03	0.12	266.8	12/7/2019 0:20	12/8/2019 4:40	28.4	0.35	0.57	36,087
12/10/2019 6:50	12/10/2019 23:30	16.7	0.28	0.02	0.12	72.2	12/10/2019 6:45	12/11/2019 9:50	27.2	0.37	0.39	36,189
12/11/2019 9:50	12/12/2019 14:40	28.8	0.49	0.02	0.24	14.2	12/11/2019 9:50	12/13/2019 2:35	40.8	0.47	0.67	68,382
12/13/2019 15:50	12/14/2019 14:05	22.3	0.36	0.02	0.36	25.4	12/13/2019 15:45	12/14/2019 15:30	23.8	0.43	0.57	36,498
12/14/2019 15:35	12/14/2019 21:30	5.9	0.06	0.01	0.12	7.5	12/14/2019 15:30	12/15/2019 0:55	9.5	0.43	0.47	14,562
12/15/2019 0:55	12/15/2019 7:25	6.5	0.06	0.01	0.12	7.8	12/15/2019 0:55	12/15/2019 13:15	12.4	0.41	0.47	18,105
12/15/2019 13:15	12/15/2019 13:50	0.6	0.04	0.07	0.24	9.1	12/15/2019 13:15	12/16/2019 1:50	12.7	0.39	0.39	17,784
12/18/2019 18:15	12/19/2019 2:35	8.3	0.35	0.04	0.12	77.0	12/18/2019 18:10	12/19/2019 12:00	17.9	0.50	0.67	32,235
12/19/2019 12:05	12/21/2019 14:25	50.3	5.37	0.11	0.72	10.9	12/19/2019 12:00	12/22/2019 2:25	62.5	4.01	10.07	901,536
12/22/2019 16:05	12/23/2019 4:00	11.9	0.26	0.02	0.12	27.2	12/22/2019 16:05	12/23/2019 16:00	24.0	1.38	1.48	118,824
12/26/2019 23:00	12/27/2019 0:50	1.8	0.03	0.02	0.12	92.5	12/26/2019 23:00	12/27/2019 12:45	13.8	0.77	0.92	38,127
12/30/2019 4:55	12/30/2019 8:20	3.4	0.07	0.02	0.12	170.4	12/30/2019 4:50	12/30/2019 20:15	15.5	0.61	0.67	33,906
12/31/2019 2:50	12/31/2019 13:15	10.4	0.04	0.00	0.12	19.9	12/31/2019 2:45	12/31/2019 14:55	12.3	0.49	0.57	21,447
12/31/2019 15:00	12/31/2019 15:25	0.4	0.04	0.10	0.12	32.1	12/31/2019 14:55	1/1/2020 2:25	10.6	0.64	0.67	24,327
1/1/2020 2:25	1/1/2020 8:20	5.9	0.47	0.08	0.72	11.4	1/1/2020 2:25	1/1/2020 19:40	17.3	1.42	2.78	88,791
1/1/2020 19:40	1/2/2020 4:30	8.8	0.65	0.07	0.48	11.9	1/1/2020 19:40	1/2/2020 11:35	16.0	2.55	2.78	146,838
1/2/2020 11:35	1/2/2020 20:05	8.5	0.11	0.01	0.12	9.8	1/2/2020 11:35	1/3/2020 8:05	20.6	1.65	2.22	122,082
1/3/2020 20:20	1/4/2020 3:15	6.9	0.26	0.04	0.12	29.2	1/3/2020 20:15	1/4/2020 15:10	19.0	1.63	2.58	111,828
1/5/2020 3:35	1/5/2020 15:05	11.5	0.26	0.02	0.24	27.2	1/5/2020 3:30	1/6/2020 2:00	22.6	1.02	2.06	82,863
1/6/2020 2:00	1/6/2020 7:35	5.6	0.03	0.01	0.12	14.7	1/6/2020 2:00	1/6/2020 18:55	17.0	0.64	0.79	39,408
1/6/2020 18:55	1/7/2020 10:05	15.2	0.42	0.03	0.12	31.6	1/6/2020 18:55	1/7/2020 15:55	21.1	1.47	1.90	111,747
1/7/2020 15:55	1/7/2020 21:00	5.1	0.16	0.03	0.36	10.2	1/7/2020 15:55	1/8/2020 8:55	17.1	1.50	1.90	92,430
1/8/2020 18:30	1/8/2020 19:20	0.8	0.03	0.04	0.12	22.4	1/8/2020 18:30	1/9/2020 7:15	12.8	0.65	0.79	30,180

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 ($feet^3$)
1/9/2020 9:45	1/9/2020 11:00	1.3	0.07	0.06	0.12	37.7	1/9/2020 9:40	1/9/2020 23:00	13.4	0.63	0.79	30,273
1/10/2020 4:50	1/10/2020 22:45	17.9	0.44	0.02	0.24	18.1	1/10/2020 4:50	1/11/2020 3:55	23.2	1.30	1.74	108,588
1/11/2020 3:55	1/11/2020 19:30	15.6	0.71	0.05	0.36	7.6	1/11/2020 3:55	1/11/2020 21:25	17.6	2.17	2.98	137,244
1/11/2020 21:25	1/12/2020 4:25	7.0	0.06	0.01	0.12	7.7	1/11/2020 21:25	1/12/2020 10:15	12.9	2.04	2.22	94,830
1/12/2020 10:15	1/12/2020 20:25	10.2	0.16	0.02	0.12	11.8	1/12/2020 10:15	1/13/2020 8:25	22.3	1.87	2.06	150,174
1/15/2020 13:50	1/16/2020 18:20	28.5	0.38	0.01	0.12	66.9	1/15/2020 13:50	1/17/2020 6:20	40.6	1.42	1.74	207,275
1/17/2020 10:50	1/17/2020 15:20	4.5	0.18	0.04	0.12	20.0	1/17/2020 10:50	1/18/2020 1:40	14.9	1.10	1.22	59,226
1/18/2020 1:40	1/18/2020 9:00	7.3	0.39	0.05	0.24	10.8	1/18/2020 1:40	1/18/2020 20:55	19.3	2.02	2.40	140,304
1/21/2020 3:45	1/21/2020 22:50	19.1	0.68	0.04	0.24	68.2	1/21/2020 3:40	1/22/2020 8:35	29.0	1.49	2.22	155,922
1/22/2020 8:40	1/25/2020 13:45	77.1	2.00	0.03	1.20	10.7	1/22/2020 8:35	1/26/2020 1:15	88.8	1.94	2.98	620,533
1/26/2020 1:20	1/26/2020 11:00	9.7	0.35	0.04	0.36	19.5	1/26/2020 1:15	1/26/2020 19:25	18.3	1.79	2.22	117,432
1/26/2020 19:30	1/26/2020 21:10	1.7	0.03	0.02	0.12	11.3	1/26/2020 19:25	1/27/2020 9:10	13.8	1.16	1.40	57,786
1/27/2020 17:10	1/28/2020 9:55	16.8	1.04	0.06	0.36	33.0	1/27/2020 17:10	1/28/2020 19:15	26.2	2.41	3.18	226,608
1/28/2020 19:20	1/28/2020 20:10	0.8	0.03	0.04	0.12	10.2	1/28/2020 19:15	1/29/2020 8:10	13.0	1.98	2.22	92,568
1/29/2020 9:35	1/29/2020 16:50	7.3	0.09	0.01	0.12	24.5	1/29/2020 9:35	1/30/2020 4:50	19.3	1.69	1.90	117,534
1/30/2020 17:05	2/2/2020 1:15	56.2	1.49	0.03	0.36	29.8	1/30/2020 17:00	2/2/2020 13:15	68.3	1.34	2.58	329,298
2/3/2020 0:15	2/3/2020 4:00	3.8	0.08	0.02	0.12	27.8	2/3/2020 0:15	2/3/2020 15:55	15.8	1.06	1.22	59,817
2/4/2020 11:50	2/7/2020 13:05	73.3	5.33	0.07	0.36	33.8	2/4/2020 11:50	2/7/2020 17:10	77.4	3.93	7.07	1,094,192
2/7/2020 17:15	2/7/2020 19:00	1.8	0.17	0.10	0.36	9.8	2/7/2020 17:10	2/8/2020 3:55	10.8	1.86	2.24	72,351
2/8/2020 3:55	2/8/2020 13:55	10.0	0.23	0.02	0.36	9.0	2/8/2020 3:55	2/9/2020 1:50	22.0	1.43	1.83	113,235
2/11/2020 23:30	2/11/2020 23:45	0.3	0.07	0.28	0.48	84.4	2/11/2020 23:30	2/12/2020 11:45	12.3	0.73	0.80	32,616
2/13/2020 9:30	2/13/2020 10:45	1.3	0.03	0.02	0.12	34.0	2/13/2020 9:30	2/13/2020 16:15	6.8	0.65	0.65	15,990
2/13/2020 16:15	2/13/2020 23:20	7.1	0.21	0.03	0.48	40.8	2/13/2020 16:15	2/14/2020 11:15	19.1	0.82	0.97	56,046
2/14/2020 21:25	2/15/2020 0:50	3.4	0.08	0.02	0.12	26.2	2/14/2020 21:20	2/15/2020 12:45	15.5	0.69	0.72	38,244
2/15/2020 18:10	2/16/2020 0:40	6.5	0.32	0.05	0.24	18.6	2/15/2020 18:10	2/16/2020 12:40	18.6	0.91	1.26	60,918
2/16/2020 15:20	2/16/2020 23:40	8.3	0.13	0.02	0.24	15.8	2/16/2020 15:20	2/17/2020 11:35	20.3	0.70	0.80	51,309
2/23/2020 5:15	2/23/2020 7:50	2.6	0.14	0.05	0.36	156.8	2/23/2020 5:10	2/23/2020 19:50	14.8	0.50	0.58	26,694
2/26/2020 3:30	2/26/2020 6:05	2.6	0.03	0.01	0.12	68.1	2/26/2020 3:30	2/26/2020 18:00	14.6	0.45	0.46	23,754
2/28/2020 16:55	2/28/2020 22:25	5.5	0.10	0.02	0.12	129.5	2/28/2020 16:55	2/29/2020 10:25	17.6	0.48	0.52	30,414
3/1/2020 18:45	3/1/2020 22:00	3.3	0.07	0.02	0.12	48.9	3/1/2020 18:40	3/2/2020 4:15	9.7	0.46	0.46	15,972
3/2/2020 4:20	3/3/2020 7:00	26.7	0.44	0.02	0.12	6.9	3/2/2020 4:15	3/3/2020 16:05	35.9	0.58	0.88	75,336
3/3/2020 16:10	3/3/2020 16:30	0.3	0.05	0.15	0.24	12.2	3/3/2020 16:05	3/4/2020 1:25	9.4	0.53	0.58	18,024
3/4/2020 1:30	3/4/2020 5:50	4.3	0.08	0.02	0.12	9.2	3/4/2020 1:25	3/4/2020 17:45	16.4	0.51	0.58	30,102
3/5/2020 21:00	3/6/2020 12:45	15.8	0.76	0.05	0.24	39.6	3/5/2020 20:55	3/7/2020 0:40	27.8	0.93	1.26	93,132
3/7/2020 11:50	3/7/2020 13:05	1.3	0.11	0.09	0.36	24.6	3/7/2020 11:45	3/7/2020 21:10	9.5	0.62	0.72	21,348
3/7/2020 21:10	3/8/2020 0:35	3.4	0.10	0.03	0.12	8.2	3/7/2020 21:10	3/8/2020 12:30	15.4	0.58	0.65	32,139
3/11/2020 4:25	3/11/2020 5:15	0.8	0.05	0.06	0.12	76.5	3/11/2020 4:25	3/11/2020 17:10	12.8	0.51	0.52	23,502
3/13/2020 5:20	3/13/2020 18:20	13.0	0.35	0.03	0.12	48.5	3/13/2020 5:15	3/14/2020 6:20	25.2	0.61	0.80	54,993
3/25/2020 1:00	3/25/2020 13:25	12.4	0.14	0.01	0.24	271.7	3/25/2020 0:55	3/26/2020 1:25	24.6	0.40	0.40	35,370
3/27/2020 6:15	3/27/2020 9:10	2.9	0.03	0.01	0.12	41.1	3/27/2020 6:10	3/27/2020 21:10	15.1	0.37	0.40	20,100
3/28/2020 1:55	3/28/2020 4:45	2.8	0.05	0.02	0.12	60.8	3/28/2020 1:50	3/28/2020 10:40	8.9	0.39	0.40	12,495
3/28/2020 10:40	3/29/2020 5:45	19.1	0.64	0.03	0.24	7.8	3/28/2020 10:40	3/29/2020 17:45	31.2	0.63	1.26	70,152
3/29/2020 19:55	3/30/2020 5:05	9.2	0.33	0.04	0.48	15.4	3/29/2020 19:50	3/30/2020 12:10	16.4	0.63	0.88	37,131
3/30/2020 12:15	3/31/2020 5:50	17.6	0.29	0.02	0.36	7.5	3/30/2020 12:10	3/31/2020 17:45	29.7	0.60	0.72	64,293
3/31/2020 17:50	3/31/2020 21:00	3.2	0.05	0.02	0.12	19.2	3/31/2020 17:45	4/1/2020 7:35	13.9	0.49	0.52	24,414

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 ($feet^3$)
4/1/2020 7:35	4/1/2020 15:20	7.8	0.08	0.01	0.24	13.7	4/1/2020 7:35	4/2/2020 3:20	19.8	0.42	0.46	30,126
4/3/2020 15:05	4/3/2020 20:40	5.6	0.14	0.03	0.12	51.1	4/3/2020 15:00	4/4/2020 8:35	17.7	0.42	0.46	26,445
4/11/2020 11:25	4/11/2020 12:25	1.0	0.04	0.04	0.24	183.7	4/11/2020 11:25	4/12/2020 0:20	13.0	0.33	0.35	15,336
4/18/2020 9:35	4/18/2020 9:55	0.3	0.03	0.09	0.12	166.2	4/18/2020 9:30	4/18/2020 21:55	12.5	0.25	0.31	11,076
4/22/2020 5:25	4/23/2020 8:55	27.5	1.12	0.04	0.24	258.0	4/22/2020 5:25	4/23/2020 16:05	34.8	0.75	1.47	93,984
4/23/2020 16:10	4/23/2020 22:30	6.3	0.10	0.02	0.12	12.5	4/23/2020 16:05	4/24/2020 10:25	18.4	0.73	0.76	48,480
4/25/2020 6:20	4/25/2020 10:45	4.4	0.37	0.08	0.48	35.0	4/25/2020 6:20	4/25/2020 22:45	16.5	0.81	1.12	48,075
4/26/2020 22:05	4/27/2020 1:45	3.7	0.11	0.03	0.12	36.1	4/26/2020 22:05	4/27/2020 13:40	15.7	0.60	0.64	34,044
4/29/2020 19:00	4/29/2020 19:45	0.8	0.04	0.05	0.12	65.5	4/29/2020 18:55	4/30/2020 7:40	12.8	0.52	0.58	24,078
5/2/2020 3:20	5/2/2020 6:35	3.3	0.12	0.04	0.36	56.3	5/2/2020 3:20	5/2/2020 10:40	7.4	0.58	0.58	15,414
5/2/2020 10:40	5/2/2020 18:55	8.3	0.41	0.05	0.48	7.0	5/2/2020 10:40	5/3/2020 6:55	20.3	0.67	0.97	49,233
5/5/2020 19:35	5/6/2020 12:35	17.0	0.38	0.02	1.32	76.8	5/5/2020 19:30	5/7/2020 0:30	29.1	0.59	0.70	61,887
5/11/2020 18:45	5/11/2020 22:15	3.5	0.07	0.02	0.12	130.4	5/11/2020 18:45	5/12/2020 10:15	15.6	0.42	0.47	23,358
5/13/2020 2:15	5/13/2020 6:20	4.1	0.06	0.01	0.12	29.7	5/13/2020 2:10	5/13/2020 18:20	16.3	0.43	0.47	25,116
5/14/2020 4:30	5/14/2020 8:30	4.0	0.18	0.05	0.36	24.3	5/14/2020 4:25	5/14/2020 20:25	16.1	0.51	0.64	29,784
5/14/2020 23:00	5/15/2020 3:40	4.7	0.03	0.01	0.12	15.4	5/14/2020 23:00	5/15/2020 15:40	16.8	0.48	0.52	28,836
5/16/2020 13:20	5/17/2020 4:15	14.9	0.73	0.05	0.48	53.8	5/16/2020 13:20	5/17/2020 16:15	27.0	0.75	1.36	73,017
5/20/2020 16:15	5/20/2020 19:30	3.3	0.09	0.03	0.12	86.7	5/20/2020 16:15	5/21/2020 1:50	9.7	0.48	0.52	16,551
5/21/2020 1:55	5/21/2020 17:35	15.7	1.27	0.08	0.48	8.9	5/21/2020 1:50	5/22/2020 5:35	27.8	1.04	1.45	104,229
5/22/2020 16:05	5/23/2020 3:20	11.3	0.18	0.02	0.12	22.8	5/22/2020 16:05	5/23/2020 15:20	23.3	0.74	0.76	61,860
5/25/2020 4:10	5/25/2020 17:45	13.6	0.32	0.02	0.12	49.6	5/25/2020 4:05	5/26/2020 5:45	25.8	0.70	0.83	65,094
5/30/2020 7:10	5/31/2020 11:05	27.9	1.49	0.05	0.72	114.4	5/30/2020 7:05	5/31/2020 23:00	40.0	1.04	2.22	149,286
6/5/2020 19:40	6/5/2020 20:40	1.0	0.04	0.04	0.12	133.2	6/5/2020 19:40	6/6/2020 8:35	13.0	0.53	0.58	24,786
6/6/2020 13:50	6/6/2020 13:55	0.1	0.03	0.36	0.24	18.2	6/6/2020 13:50	6/6/2020 22:50	9.1	0.51	0.52	16,809
6/6/2020 22:50	6/7/2020 11:00	12.2	0.58	0.05	0.24	27.2	6/6/2020 22:50	6/7/2020 19:50	21.1	0.76	1.05	57,657
6/7/2020 19:50	6/7/2020 20:20	0.5	0.17	0.34	1.56	12.3	6/7/2020 19:50	6/8/2020 8:15	12.5	0.76	0.97	34,392
6/9/2020 0:40	6/9/2020 12:45	12.1	0.32	0.03	0.12	28.8	6/9/2020 0:40	6/9/2020 18:40	18.1	0.69	0.83	45,135
6/9/2020 18:45	6/9/2020 20:25	1.7	0.05	0.03	0.12	8.5	6/9/2020 18:40	6/10/2020 8:25	13.8	0.69	0.76	34,428
6/11/2020 7:10	6/11/2020 12:25	5.3	0.20	0.04	0.24	36.4	6/11/2020 7:10	6/12/2020 0:20	17.3	0.63	0.76	38,880
6/12/2020 12:05	6/12/2020 14:55	2.8	0.25	0.09	0.24	24.8	6/12/2020 12:00	6/12/2020 21:30	9.6	0.74	0.90	25,575
6/12/2020 21:30	6/13/2020 2:25	4.9	0.11	0.02	0.36	6.9	6/12/2020 21:30	6/13/2020 14:25	17.0	0.68	0.70	41,706
6/13/2020 20:55	6/14/2020 0:40	3.8	0.63	0.17	1.32	20.9	6/13/2020 20:55	6/14/2020 12:40	15.8	0.99	1.73	56,304
6/15/2020 4:50	6/15/2020 14:30	9.7	0.20	0.02	0.12	30.7	6/15/2020 4:50	6/16/2020 2:25	21.7	0.70	0.76	54,402
6/16/2020 3:10	6/16/2020 13:15	10.1	0.07	0.01	0.12	17.1	6/16/2020 3:10	6/17/2020 1:15	22.2	0.61	0.64	49,038
6/21/2020 5:20	6/21/2020 5:55	0.6	0.05	0.09	0.24	117.5	6/21/2020 5:15	6/21/2020 17:55	12.8	0.44	0.47	20,367
6/27/2020 10:30	6/28/2020 6:40	20.2	0.71	0.04	0.24	149.1	6/27/2020 10:25	6/28/2020 18:40	32.3	0.69	1.28	80,238
7/12/2020 4:10	7/12/2020 9:10	5.0	0.09	0.02	0.12	335.7	7/12/2020 4:10	7/12/2020 21:10	17.1	0.35	0.41	21,798
7/22/2020 5:00	7/22/2020 8:55	3.9	0.05	0.01	0.12	239.8	7/22/2020 5:00	7/22/2020 20:55	16.0	0.41	0.41	23,481
8/6/2020 7:15	8/6/2020 15:00	7.8	0.50	0.06	0.72	361.8	8/6/2020 7:15	8/7/2020 2:55	19.8	0.56	0.97	39,654
8/8/2020 4:30	8/8/2020 10:15	5.8	0.08	0.01	0.12	42.8	8/8/2020 4:25	8/8/2020 22:15	17.9	0.45	0.47	29,091
8/20/2020 19:50	8/21/2020 0:50	5.0	0.12	0.02	0.36	300.3	8/20/2020 19:50	8/21/2020 6:55	11.2	0.38	0.47	15,390

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 ($feet^3$)
10/3/2019	10/3/2019	1.1	0.03	0.03	0.12	95.8	10/3/2019	10/3/2019	13.2	0.32	0.36	15,240
10/3/2019	10/3/2019	0.4	0.03	0.07	0.12	111.6	10/3/2019	10/4/2019	9.1	0.32	0.32	10,464
10/4/2019	10/4/2019	2.3	0.04	0.02	0.12	120.7	10/4/2019	10/4/2019	14.5	0.34	0.36	17,796
10/7/2019	10/8/2019	21.0	0.65	0.03	1.32	88.2	10/7/2019	10/9/2019	33.1	1.01	1.98	120,552
10/16/2019	10/16/2019	4.6	0.13	0.03	0.12	186.7	10/16/2019	10/16/2019	10.6	0.39	0.51	15,006
10/16/2019	10/16/2019	4.5	0.23	0.05	0.24	6.7	10/16/2019	10/17/2019	12.7	0.92	1.18	42,033
10/17/2019	10/17/2019	13.3	0.10	0.01	0.12	11.5	10/17/2019	10/18/2019	25.4	0.56	0.77	50,883
10/18/2019	10/19/2019	21.3	1.03	0.05	0.48	25.3	10/18/2019	10/20/2019	33.3	2.11	3.22	252,485
10/20/2019	10/21/2019	17.4	0.30	0.02	0.48	19.9	10/20/2019	10/21/2019	24.8	1.53	2.26	136,788
10/21/2019	10/22/2019	21.5	0.93	0.04	0.48	9.5	10/21/2019	10/22/2019	33.6	2.89	4.62	349,734
10/25/2019	10/25/2019	11.2	0.33	0.03	0.36	77.8	10/25/2019	10/26/2019	23.2	1.07	1.39	89,478
11/9/2019	11/9/2019	15.8	0.33	0.02	0.24	339.9	11/9/2019	11/10/2019	27.8	0.61	0.92	61,353
11/12/2019	11/12/2019	3.9	0.30	0.08	0.12	60.4	11/12/2019	11/12/2019	16.0	0.97	1.39	55,887
11/15/2019	11/15/2019	2.0	0.19	0.10	0.24	68.5	11/15/2019	11/15/2019	13.8	0.87	1.09	43,401
11/15/2019	11/15/2019	2.3	0.81	0.36	0.96	12.4	11/15/2019	11/16/2019	14.3	4.16	8.75	214,671
11/16/2019	11/16/2019	3.7	0.07	0.02	0.12	19.0	11/16/2019	11/16/2019	8.9	1.71	1.85	54,993
11/16/2019	11/17/2019	21.4	0.40	0.02	0.36	6.6	11/16/2019	11/18/2019	33.4	1.77	2.26	213,366
11/18/2019	11/19/2019	14.1	0.41	0.03	0.24	16.3	11/18/2019	11/19/2019	15.6	2.38	3.40	133,284
11/19/2019	11/19/2019	6.5	0.11	0.02	0.12	7.1	11/19/2019	11/19/2019	18.7	1.90	2.26	127,899
11/23/2019	11/24/2019	6.8	0.12	0.02	0.12	111.9	11/23/2019	11/24/2019	18.8	0.63	0.77	42,813
11/24/2019	11/25/2019	11.1	0.52	0.05	0.60	20.1	11/24/2019	11/25/2019	17.8	1.70	2.55	108,402
11/25/2019	11/26/2019	13.3	0.21	0.02	0.24	7.4	11/25/2019	11/26/2019	25.3	1.74	2.55	158,787
12/1/2019	12/1/2019	2.3	0.03	0.01	0.12	133.9	12/1/2019	12/2/2019	14.3	0.45	0.46	23,286
12/6/2019	12/7/2019	20.4	0.39	0.02	0.12	262.8	12/6/2019	12/8/2019	32.5	0.91	1.39	106,824
12/10/2019	12/10/2019	10.4	0.21	0.02	0.12	72.6	12/10/2019	12/11/2019	22.6	0.76	0.92	61,524
12/11/2019	12/12/2019	14.3	0.34	0.02	0.12	14.9	12/11/2019	12/12/2019	20.3	1.35	1.85	98,688
12/12/2019	12/12/2019	2.9	0.04	0.01	0.12	7.5	12/12/2019	12/12/2019	7.6	1.26	1.28	34,284
12/12/2019	12/12/2019	3.8	0.11	0.03	0.24	7.6	12/12/2019	12/13/2019	15.8	1.22	1.61	69,771
12/13/2019	12/14/2019	16.0	0.50	0.03	0.84	33.4	12/13/2019	12/14/2019	23.8	1.64	2.40	140,178
12/14/2019	12/15/2019	7.7	0.10	0.01	0.12	8.0	12/14/2019	12/15/2019	19.8	1.39	1.61	98,805
12/18/2019	12/19/2019	13.4	0.32	0.02	0.12	84.0	12/18/2019	12/19/2019	18.3	1.23	1.85	80,874
12/19/2019	12/21/2019	54.7	4.87	0.09	1.44	11.8	12/19/2019	12/22/2019	66.7	14.42	43.96	3,461,374
12/22/2019	12/23/2019	11.1	0.19	0.02	0.12	27.6	12/22/2019	12/23/2019	23.2	4.42	5.32	368,556
12/30/2019	12/30/2019	2.6	0.05	0.02	0.12	171.4	12/30/2019	12/30/2019	14.8	0.94	1.00	49,836
12/31/2019	12/31/2019	7.3	0.07	0.01	0.24	26.9	12/31/2019	1/1/2020	18.3	0.95	1.09	62,694
1/1/2020	1/1/2020	1.1	0.37	0.34	1.08	15.9	1/1/2020	1/1/2020	12.4	2.44	3.59	108,870
1/1/2020	1/2/2020	12.0	0.50	0.04	0.48	11.9	1/1/2020	1/2/2020	16.6	3.26	4.19	194,523
1/2/2020	1/2/2020	7.8	0.11	0.01	0.12	10.9	1/2/2020	1/3/2020	19.8	2.36	2.71	168,480
1/3/2020	1/4/2020	4.8	0.30	0.06	0.12	28.3	1/3/2020	1/4/2020	17.0	2.39	3.40	146,199
1/4/2020	1/4/2020	1.3	0.03	0.02	0.12	15.4	1/4/2020	1/5/2020	12.1	1.68	1.85	72,957
1/5/2020	1/5/2020	11.8	0.30	0.03	0.24	27.4	1/5/2020	1/6/2020	22.9	2.12	2.87	174,912
1/6/2020	1/6/2020	5.7	0.03	0.01	0.12	11.5	1/6/2020	1/6/2020	11.3	1.81	1.98	73,449

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 ($feet^3$)
1/6/2020	1/7/2020	19.4	0.33	0.02	0.12	22.8	1/6/2020	1/7/2020	26.3	2.23	3.04	210,519
1/7/2020	1/7/2020	5.4	0.08	0.01	0.12	10.2	1/7/2020	1/8/2020	17.4	2.06	2.40	128,913
1/8/2020	1/8/2020	3.7	0.04	0.01	0.12	24.9	1/8/2020	1/9/2020	12.8	1.35	1.49	62,283
1/9/2020	1/9/2020	3.2	0.08	0.03	0.12	12.8	1/9/2020	1/9/2020	15.3	1.33	1.49	72,831
1/10/2020	1/10/2020	18.8	0.42	0.02	0.12	18.4	1/10/2020	1/11/2020	25.8	2.11	2.71	196,080
1/11/2020	1/12/2020	21.2	0.73	0.03	0.36	9.2	1/11/2020	1/12/2020	28.6	4.10	7.19	421,887
1/12/2020	1/12/2020	11.2	0.41	0.04	0.24	10.3	1/12/2020	1/13/2020	23.2	4.03	5.82	335,994
1/15/2020	1/16/2020	24.9	0.80	0.03	0.24	64.2	1/15/2020	1/17/2020	37.0	1.93	2.12	256,470
1/17/2020	1/18/2020	14.3	0.35	0.02	0.24	32.2	1/17/2020	1/18/2020	26.4	3.17	4.62	301,852
1/21/2020	1/21/2020	19.1	0.81	0.04	0.36	67.9	1/21/2020	1/22/2020	29.2	3.36	6.62	353,289
1/22/2020	1/23/2020	16.1	0.30	0.02	0.12	10.8	1/22/2020	1/23/2020	20.7	3.61	4.40	268,227
1/23/2020	1/24/2020	26.7	0.99	0.04	0.36	10.3	1/23/2020	1/24/2020	29.8	5.46	7.79	584,678
1/24/2020	1/25/2020	21.3	0.27	0.01	0.12	7.2	1/24/2020	1/25/2020	25.9	4.28	5.32	399,735
1/25/2020	1/25/2020	2.3	0.04	0.02	0.12	8.7	1/25/2020	1/26/2020	12.7	3.31	3.59	150,981
1/26/2020	1/26/2020	10.0	0.30	0.03	0.24	12.6	1/26/2020	1/26/2020	18.6	3.72	5.08	248,958
1/26/2020	1/26/2020	1.6	0.05	0.03	0.12	14.3	1/26/2020	1/27/2020	13.7	2.83	3.22	139,020
1/27/2020	1/28/2020	17.9	0.96	0.05	0.36	21.5	1/27/2020	1/28/2020	27.5	5.27	9.09	521,303
1/28/2020	1/29/2020	4.3	0.03	0.01	0.12	12.9	1/28/2020	1/29/2020	13.6	3.65	4.19	178,671
1/29/2020	1/29/2020	7.3	0.10	0.01	0.12	26.4	1/29/2020	1/30/2020	19.4	3.00	3.59	209,436
1/30/2020	1/31/2020	12.3	0.16	0.01	0.12	27.1	1/30/2020	1/31/2020	17.2	2.46	2.87	152,073
1/31/2020	2/2/2020	40.9	1.33	0.03	0.24	10.4	1/31/2020	2/2/2020	50.7	4.62	8.42	843,570
2/2/2020	2/2/2020	0.8	0.03	0.04	0.12	10.2	2/2/2020	2/2/2020	12.8	3.56	3.98	164,652
2/3/2020	2/3/2020	1.8	0.08	0.05	0.12	23.8	2/3/2020	2/3/2020	13.9	3.04	3.59	152,130
2/4/2020	2/7/2020	70.3	4.55	0.06	0.24	34.6	2/4/2020	2/7/2020	75.3	14.62	33.55	3,961,523
2/7/2020	2/7/2020	5.3	0.23	0.04	0.24	7.1	2/7/2020	2/8/2020	12.5	8.23	10.81	370,548
2/8/2020	2/8/2020	9.8	0.20	0.02	0.24	9.0	2/8/2020	2/9/2020	21.8	6.07	8.42	477,431
2/13/2020	2/13/2020	3.7	0.13	0.04	0.36	128.1	2/13/2020	2/14/2020	15.7	1.95	2.26	110,076
2/14/2020	2/15/2020	5.6	0.06	0.01	0.12	26.8	2/14/2020	2/15/2020	17.7	1.53	1.73	97,080
2/15/2020	2/16/2020	7.9	0.28	0.04	0.48	20.5	2/15/2020	2/16/2020	19.2	2.13	2.87	146,922
2/16/2020	2/16/2020	2.3	0.08	0.04	0.12	15.4	2/16/2020	2/17/2020	14.3	1.74	2.12	89,874
2/23/2020	2/23/2020	2.8	0.15	0.05	0.36	156.8	2/23/2020	2/23/2020	14.8	1.25	1.61	66,150
2/28/2020	2/28/2020	7.1	0.10	0.01	0.12	129.3	2/28/2020	2/29/2020	19.2	0.75	0.84	51,849
3/1/2020	3/1/2020	4.8	0.07	0.01	0.12	30.1	2/29/2020	3/1/2020	17.0	0.67	0.70	41,133
3/1/2020	3/1/2020	2.1	0.09	0.04	0.12	14.8	3/1/2020	3/2/2020	8.5	0.90	1.09	27,591
3/2/2020	3/3/2020	26.6	0.46	0.02	0.12	7.0	3/2/2020	3/3/2020	36.7	1.51	2.12	199,941
3/3/2020	3/3/2020	0.6	0.04	0.07	0.12	11.2	3/3/2020	3/4/2020	9.1	1.40	1.49	45,720
3/4/2020	3/4/2020	4.6	0.21	0.05	0.36	9.0	3/4/2020	3/4/2020	16.8	1.82	2.40	109,998
3/5/2020	3/6/2020	17.7	0.86	0.05	0.24	37.2	3/5/2020	3/7/2020	29.7	3.00	5.08	319,950
3/7/2020	3/7/2020	1.1	0.03	0.03	0.12	24.7	3/7/2020	3/7/2020	10.2	1.91	2.12	69,978
3/7/2020	3/8/2020	10.3	0.35	0.03	0.60	34.8	3/7/2020	3/8/2020	22.5	2.30	2.71	186,153
3/11/2020	3/11/2020	1.1	0.07	0.06	0.24	71.5	3/11/2020	3/11/2020	13.3	1.14	1.28	54,285
3/13/2020	3/13/2020	13.9	0.27	0.02	0.12	48.8	3/13/2020	3/14/2020	26.1	1.19	1.73	112,182
3/24/2020	3/25/2020	18.6	0.38	0.02	0.72	262.0	3/24/2020	3/25/2020	22.1	1.02	1.28	81,402

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 ($feet^3$)
3/25/2020	3/25/2020	0.3	0.05	0.20	0.36	7.2	3/25/2020	3/26/2020	12.4	0.85	1.00	38,157
3/26/2020	3/26/2020	2.3	0.03	0.01	0.12	23.0	3/26/2020	3/27/2020	14.4	0.63	0.63	32,625
3/28/2020	3/28/2020	2.3	0.04	0.02	0.12	61.5	3/28/2020	3/28/2020	13.4	0.64	0.70	30,672
3/28/2020	3/29/2020	14.4	0.71	0.05	0.24	13.4	3/28/2020	3/29/2020	26.5	2.18	4.19	208,410
3/30/2020	3/30/2020	3.8	0.33	0.09	0.48	20.6	3/30/2020	3/30/2020	11.0	2.27	3.22	89,811
3/30/2020	3/31/2020	16.3	0.38	0.02	0.48	7.5	3/30/2020	3/31/2020	26.7	2.30	3.78	220,967
3/31/2020	3/31/2020	3.0	0.13	0.04	0.24	17.1	3/31/2020	4/1/2020	13.1	1.87	2.12	87,924
4/1/2020	4/1/2020	10.8	0.23	0.02	0.24	10.2	4/1/2020	4/2/2020	22.9	1.74	2.26	143,892
4/3/2020	4/3/2020	5.7	0.17	0.03	0.24	47.9	4/3/2020	4/4/2020	17.8	1.24	1.49	79,767
4/11/2020	4/11/2020	1.3	0.06	0.05	0.12	183.9	4/11/2020	4/12/2020	13.3	0.52	0.57	24,648
4/18/2020	4/18/2020	9.0	0.06	0.01	0.12	157.7	4/18/2020	4/18/2020	21.1	0.40	0.46	29,994
4/22/2020	4/23/2020	27.2	1.08	0.04	0.24	95.2	4/22/2020	4/23/2020	34.8	1.71	3.22	214,512
4/23/2020	4/23/2020	6.2	0.29	0.05	0.36	13.2	4/23/2020	4/24/2020	18.3	2.08	2.87	136,884
4/25/2020	4/25/2020	4.0	0.38	0.10	0.48	33.3	4/25/2020	4/25/2020	16.1	2.02	3.04	116,721
4/26/2020	4/27/2020	3.8	0.11	0.03	0.12	36.8	4/26/2020	4/27/2020	15.8	0.95	1.09	54,057
4/29/2020	4/29/2020	0.5	0.03	0.06	0.12	66.0	4/29/2020	4/30/2020	12.5	0.51	0.57	23,013
5/2/2020	5/2/2020	3.5	0.12	0.03	0.24	122.0	5/2/2020	5/2/2020	7.3	0.51	0.57	13,296
5/2/2020	5/2/2020	5.2	0.43	0.08	0.48	6.7	5/2/2020	5/3/2020	17.3	1.39	2.40	86,847
5/5/2020	5/6/2020	13.3	0.30	0.02	1.08	77.7	5/5/2020	5/6/2020	25.4	0.72	1.00	65,712
5/11/2020	5/11/2020	2.8	0.08	0.03	0.24	130.2	5/11/2020	5/12/2020	14.8	0.33	0.36	17,844
5/13/2020	5/13/2020	3.5	0.03	0.01	0.12	29.9	5/13/2020	5/13/2020	15.7	0.27	0.28	15,444
5/14/2020	5/14/2020	4.3	0.17	0.04	0.36	55.8	5/14/2020	5/14/2020	16.3	0.42	0.63	24,723
5/16/2020	5/17/2020	17.8	0.66	0.04	0.48	53.9	5/16/2020	5/17/2020	29.9	1.08	2.40	116,469
5/20/2020	5/20/2020	3.6	0.11	0.03	0.12	86.9	5/20/2020	5/21/2020	9.5	0.37	0.46	12,594
5/21/2020	5/21/2020	15.3	1.01	0.07	0.60	6.3	5/21/2020	5/22/2020	27.4	1.91	3.40	188,157
5/22/2020	5/23/2020	13.6	0.24	0.02	0.24	22.3	5/22/2020	5/23/2020	25.6	1.01	1.39	92,799
5/25/2020	5/25/2020	14.7	0.24	0.02	0.12	49.1	5/25/2020	5/26/2020	26.8	0.75	1.00	72,519
5/30/2020	5/31/2020	28.1	1.50	0.05	0.48	117.7	5/30/2020	5/31/2020	40.2	2.23	5.08	322,329
6/5/2020	6/5/2020	0.1	0.12	1.44	0.84	130.9	6/5/2020	6/6/2020	12.3	0.41	0.51	18,111
6/6/2020	6/7/2020	11.4	0.70	0.06	0.60	26.4	6/6/2020	6/7/2020	23.5	1.36	1.98	114,651
6/9/2020	6/9/2020	12.4	0.29	0.02	0.12	40.9	6/9/2020	6/9/2020	18.6	0.77	1.00	51,765
6/9/2020	6/9/2020	1.5	0.03	0.02	0.12	8.7	6/9/2020	6/10/2020	13.6	0.61	0.77	29,886
6/11/2020	6/11/2020	2.8	0.21	0.07	0.24	47.2	6/11/2020	6/12/2020	15.0	0.75	1.09	40,266
6/12/2020	6/12/2020	3.3	0.25	0.08	0.24	24.6	6/12/2020	6/12/2020	9.7	0.98	1.39	34,164
6/12/2020	6/13/2020	3.3	0.10	0.03	0.24	6.8	6/12/2020	6/13/2020	15.4	0.86	1.09	47,514
6/13/2020	6/13/2020	3.5	0.35	0.10	0.36	20.6	6/13/2020	6/14/2020	15.7	1.35	2.40	76,122

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 ($feet^3$)
10/3/2019 1:40	10/3/2019 2:45	1.1	0.03	0.03	0.12	95.8	10/3/2019 1:40	10/3/2019 14:45	13.2	0.06	0.06	2,844
10/3/2019 17:25	10/3/2019 17:50	0.4	0.03	0.07	0.12	111.6	10/3/2019 17:25	10/4/2019 2:25	9.1	0.06	0.06	1,962
10/4/2019 2:30	10/4/2019 4:50	2.3	0.04	0.02	0.12	120.7	10/4/2019 2:25	10/4/2019 16:50	14.5	0.06	0.06	3,087
10/7/2019 18:45	10/8/2019 15:45	21.0	0.65	0.03	1.32	88.2	10/7/2019 18:40	10/9/2019 3:40	33.1	0.25	0.45	29,550
10/16/2019 5:15	10/16/2019 9:50	4.6	0.13	0.03	0.12	186.7	10/16/2019 5:10	10/16/2019 15:40	10.6	0.04	0.05	1,617
10/16/2019 15:40	10/16/2019 20:10	4.5	0.23	0.05	0.24	6.7	10/16/2019 15:40	10/17/2019 4:15	12.7	0.18	0.25	8,097
10/17/2019 4:20	10/17/2019 17:40	13.3	0.10	0.01	0.12	11.5	10/17/2019 4:15	10/18/2019 5:35	25.4	0.10	0.18	8,820
10/18/2019 15:10	10/19/2019 12:25	21.3	1.03	0.05	0.48	25.3	10/18/2019 15:10	10/20/2019 0:20	33.3	0.73	1.21	87,012
10/20/2019 7:05	10/21/2019 0:30	17.4	0.30	0.02	0.48	19.9	10/20/2019 7:05	10/21/2019 7:50	24.8	0.51	0.69	45,744
10/21/2019 7:50	10/22/2019 5:20	21.5	0.93	0.04	0.48	9.5	10/21/2019 7:50	10/22/2019 17:20	33.6	0.92	1.57	111,588
10/25/2019 9:40	10/25/2019 20:50	11.2	0.33	0.03	0.36	77.8	10/25/2019 9:40	10/26/2019 8:45	23.2	0.29	0.41	24,504
11/9/2019 0:40	11/9/2019 16:25	15.8	0.33	0.02	0.24	339.9	11/9/2019 0:40	11/10/2019 4:25	27.8	0.13	0.25	13,020
11/12/2019 3:55	11/12/2019 7:50	3.9	0.30	0.08	0.12	60.4	11/12/2019 3:55	11/12/2019 19:50	16.0	0.26	0.41	15,087
11/15/2019 3:40	11/15/2019 5:40	2.0	0.19	0.10	0.24	68.5	11/15/2019 3:40	11/15/2019 17:25	13.8	0.25	0.36	12,270
11/15/2019 17:25	11/15/2019 19:40	2.3	0.81	0.36	0.96	12.4	11/15/2019 17:25	11/16/2019 7:40	14.3	1.36	3.51	70,188
11/16/2019 14:35	11/16/2019 18:15	3.7	0.07	0.02	0.12	19.0	11/16/2019 14:35	11/16/2019 23:25	8.9	0.52	0.56	16,776
11/16/2019 23:25	11/17/2019 20:50	21.4	0.40	0.02	0.36	6.6	11/16/2019 23:25	11/18/2019 8:45	33.4	0.54	0.69	64,761
11/18/2019 11:50	11/19/2019 1:55	14.1	0.41	0.03	0.24	16.3	11/18/2019 11:50	11/19/2019 3:20	15.6	0.77	1.21	43,326
11/19/2019 3:25	11/19/2019 9:55	6.5	0.11	0.02	0.12	7.1	11/19/2019 3:20	11/19/2019 21:55	18.7	0.59	0.69	39,363
11/23/2019 23:00	11/24/2019 5:50	6.8	0.12	0.02	0.12	111.9	11/23/2019 23:00	11/24/2019 17:45	18.8	0.13	0.18	8,811
11/24/2019 21:25	11/25/2019 8:30	11.1	0.52	0.05	0.60	20.1	11/24/2019 21:20	11/25/2019 15:00	17.8	0.53	0.76	33,813
11/25/2019 15:05	11/26/2019 4:20	13.3	0.21	0.02	0.24	7.4	11/25/2019 15:00	11/26/2019 16:15	25.3	0.58	0.92	53,223
12/1/2019 11:25	12/1/2019 13:40	2.3	0.03	0.01	0.12	133.9	12/1/2019 11:25	12/2/2019 1:40	14.3	0.09	0.09	4,644
12/6/2019 20:20	12/7/2019 16:45	20.4	0.39	0.02	0.12	262.8	12/6/2019 20:15	12/8/2019 4:40	32.5	0.25	0.41	29,280
12/10/2019 11:30	12/10/2019 21:55	10.4	0.21	0.02	0.12	72.6	12/10/2019 11:25	12/11/2019 9:55	22.6	0.21	0.28	17,346
12/11/2019 9:55	12/12/2019 0:15	14.3	0.34	0.02	0.12	14.9	12/11/2019 9:55	12/12/2019 6:10	20.3	0.43	0.62	31,809
12/12/2019 6:10	12/12/2019 9:05	2.9	0.04	0.01	0.12	7.5	12/12/2019 6:10	12/12/2019 13:40	7.6	0.41	0.45	11,109
12/12/2019 13:45	12/12/2019 17:30	3.8	0.11	0.03	0.24	7.6	12/12/2019 13:40	12/13/2019 5:25	15.8	0.39	0.51	22,083
12/13/2019 23:55	12/14/2019 15:55	16.0	0.50	0.03	0.84	33.4	12/13/2019 23:55	12/14/2019 23:35	23.8	0.44	0.56	37,614
12/14/2019 23:35	12/15/2019 7:15	7.7	0.10	0.01	0.12	8.0	12/14/2019 23:35	12/15/2019 19:15	19.8	0.43	0.45	30,393
12/18/2019 18:00	12/19/2019 7:25	13.4	0.32	0.02	0.12	84.0	12/18/2019 17:55	12/19/2019 12:10	18.3	0.35	0.51	23,340
12/19/2019 12:10	12/21/2019 18:50	54.7	4.87	0.09	1.44	11.8	12/19/2019 12:10	12/22/2019 6:45	66.7	5.84	26.38	1,400,575
12/22/2019 16:55	12/23/2019 4:00	11.1	0.19	0.02	0.12	27.6	12/22/2019 16:55	12/23/2019 16:00	23.2	1.95	2.13	162,465
12/30/2019 4:45	12/30/2019 7:20	2.6	0.05	0.02	0.12	171.4	12/30/2019 4:40	12/30/2019 19:20	14.8	0.28	0.32	14,844
12/31/2019 8:10	12/31/2019 15:25	7.3	0.07	0.01	0.24	26.9	12/31/2019 8:10	1/1/2020 3:25	18.3	0.26	0.32	17,475
1/1/2020 7:10	1/1/2020 8:15	1.1	0.37	0.34	1.08	15.9	1/1/2020 7:05	1/1/2020 19:25	12.4	0.99	1.95	44,133
1/1/2020 19:30	1/2/2020 7:30	12.0	0.50	0.04	0.48	11.9	1/1/2020 19:25	1/2/2020 11:55	16.6	1.52	1.95	90,993
1/2/2020 11:55	1/2/2020 19:40	7.8	0.11	0.01	0.12	10.9	1/2/2020 11:55	1/3/2020 7:40	19.8	1.12	1.32	79,788
1/3/2020 20:15	1/4/2020 1:05	4.8	0.30	0.06	0.12	28.3	1/3/2020 20:10	1/4/2020 13:05	17.0	1.07	1.57	65,202
1/4/2020 15:30	1/4/2020 16:50	1.3	0.03	0.02	0.12	15.4	1/4/2020 15:30	1/5/2020 3:30	12.1	0.65	0.76	28,368
1/5/2020 3:30	1/5/2020 15:15	11.8	0.30	0.03	0.24	27.4	1/5/2020 3:30	1/6/2020 2:20	22.9	0.99	1.57	81,435
1/6/2020 2:20	1/6/2020 8:00	5.7	0.03	0.01	0.12	11.5	1/6/2020 2:20	1/6/2020 13:30	11.3	0.84	0.92	34,188
1/6/2020 13:35	1/7/2020 9:00	19.4	0.33	0.02	0.12	22.8	1/6/2020 13:30	1/7/2020 15:40	26.3	0.95	1.32	89,550
1/7/2020 15:40	1/7/2020 21:05	5.4	0.08	0.01	0.12	10.2	1/7/2020 15:40	1/8/2020 9:00	17.4	0.86	1.01	54,051

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 ($feet^3$)
1/8/2020 18:15	1/8/2020 21:55	3.7	0.04	0.01	0.12	24.9	1/8/2020 18:10	1/9/2020 6:55	12.8	0.47	0.51	21,858
1/9/2020 7:00	1/9/2020 10:10	3.2	0.08	0.03	0.12	12.8	1/9/2020 6:55	1/9/2020 22:05	15.3	0.44	0.51	24,297
1/10/2020 3:00	1/10/2020 21:50	18.8	0.42	0.02	0.12	18.4	1/10/2020 2:55	1/11/2020 4:40	25.8	1.01	1.44	93,465
1/11/2020 4:40	1/12/2020 1:50	21.2	0.73	0.03	0.36	9.2	1/11/2020 4:40	1/12/2020 9:10	28.6	2.00	3.15	205,686
1/12/2020 9:10	1/12/2020 20:20	11.2	0.41	0.04	0.24	10.3	1/12/2020 9:10	1/13/2020 8:15	23.2	1.98	2.61	164,985
1/15/2020 11:30	1/16/2020 12:25	24.9	0.80	0.03	0.24	64.2	1/15/2020 11:25	1/17/2020 0:20	37.0	0.63	0.76	84,441
1/17/2020 20:30	1/18/2020 10:45	14.3	0.35	0.02	0.24	32.2	1/17/2020 20:25	1/18/2020 22:45	26.4	1.18	1.78	112,023
1/21/2020 3:35	1/21/2020 22:40	19.1	0.81	0.04	0.36	67.9	1/21/2020 3:30	1/22/2020 8:35	29.2	1.24	2.51	130,524
1/22/2020 8:35	1/23/2020 0:40	16.1	0.30	0.02	0.12	10.8	1/22/2020 8:35	1/23/2020 5:10	20.7	1.42	1.86	105,990
1/23/2020 5:15	1/24/2020 7:55	26.7	0.99	0.04	0.36	10.3	1/23/2020 5:10	1/24/2020 10:50	29.8	2.06	2.93	220,146
1/24/2020 10:50	1/25/2020 8:10	21.3	0.27	0.01	0.12	7.2	1/24/2020 10:50	1/25/2020 12:40	25.9	1.70	2.04	158,232
1/25/2020 12:45	1/25/2020 15:05	2.3	0.04	0.02	0.12	8.7	1/25/2020 12:40	1/26/2020 1:15	12.7	1.28	1.44	58,248
1/26/2020 1:20	1/26/2020 11:20	10.0	0.30	0.03	0.24	12.6	1/26/2020 1:15	1/26/2020 19:45	18.6	1.48	1.95	98,775
1/26/2020 19:45	1/26/2020 21:20	1.6	0.05	0.03	0.12	14.3	1/26/2020 19:45	1/27/2020 9:20	13.7	1.10	1.21	53,892
1/27/2020 17:15	1/28/2020 11:10	17.9	0.96	0.05	0.36	21.5	1/27/2020 17:10	1/28/2020 20:35	27.5	1.95	3.15	193,074
1/28/2020 20:35	1/29/2020 0:50	4.3	0.03	0.01	0.12	12.9	1/28/2020 20:35	1/29/2020 10:05	13.6	1.39	1.57	68,175
1/29/2020 10:05	1/29/2020 17:25	7.3	0.10	0.01	0.12	26.4	1/29/2020 10:05	1/30/2020 5:25	19.4	1.10	1.32	76,962
1/30/2020 15:10	1/31/2020 3:30	12.3	0.16	0.01	0.12	27.1	1/30/2020 15:10	1/31/2020 8:15	17.2	0.91	1.00	55,974
1/31/2020 8:15	2/2/2020 1:10	40.9	1.33	0.03	0.24	10.4	1/31/2020 8:15	2/2/2020 10:50	50.7	1.81	3.51	330,833
2/2/2020 10:50	2/2/2020 11:35	0.8	0.03	0.04	0.12	10.2	2/2/2020 10:50	2/2/2020 23:35	12.8	1.38	1.49	63,864
2/3/2020 0:25	2/3/2020 2:10	1.8	0.08	0.05	0.12	23.8	2/3/2020 0:20	2/3/2020 14:10	13.9	1.18	1.28	59,067
2/4/2020 12:15	2/7/2020 10:30	70.3	4.55	0.06	0.24	34.6	2/4/2020 12:10	2/7/2020 15:20	75.3	6.04	13.52	1,636,890
2/7/2020 15:20	2/7/2020 20:35	5.3	0.23	0.04	0.24	7.1	2/7/2020 15:20	2/8/2020 3:45	12.5	2.35	3.31	105,699
2/8/2020 3:50	2/8/2020 13:35	9.8	0.20	0.02	0.24	9.0	2/8/2020 3:45	2/9/2020 1:30	21.8	1.81	2.76	142,056
2/13/2020 15:55	2/13/2020 19:35	3.7	0.13	0.04	0.36	128.1	2/13/2020 15:55	2/14/2020 7:30	15.7	0.51	0.63	28,683
2/14/2020 21:35	2/15/2020 3:10	5.6	0.06	0.01	0.12	26.8	2/14/2020 21:35	2/15/2020 15:10	17.7	0.34	0.38	21,903
2/15/2020 19:55	2/16/2020 3:50	7.9	0.28	0.04	0.48	20.5	2/15/2020 19:50	2/16/2020 14:55	19.2	0.52	0.71	36,087
2/16/2020 15:00	2/16/2020 17:15	2.3	0.08	0.04	0.12	15.4	2/16/2020 14:55	2/17/2020 5:10	14.3	0.40	0.49	20,394
2/23/2020 4:50	2/23/2020 7:35	2.8	0.15	0.05	0.36	156.8	2/23/2020 4:50	2/23/2020 19:30	14.8	0.18	0.28	9,654
2/28/2020 16:50	2/28/2020 23:55	7.1	0.10	0.01	0.12	129.3	2/28/2020 16:50	2/29/2020 11:55	19.2	0.08	0.09	5,700
3/1/2020 0:00	3/1/2020 4:50	4.8	0.07	0.01	0.12	30.1	2/29/2020 23:55	3/1/2020 16:50	17.0	0.07	0.08	4,512
3/1/2020 19:10	3/1/2020 21:15	2.1	0.09	0.04	0.12	14.8	3/1/2020 19:05	3/2/2020 3:30	8.5	0.11	0.15	3,516
3/2/2020 3:30	3/3/2020 6:05	26.6	0.46	0.02	0.12	7.0	3/2/2020 3:30	3/3/2020 16:05	36.7	0.30	0.49	39,726
3/3/2020 16:10	3/3/2020 16:45	0.6	0.04	0.07	0.12	11.2	3/3/2020 16:05	3/4/2020 1:05	9.1	0.25	0.28	8,079
3/4/2020 1:10	3/4/2020 5:45	4.6	0.21	0.05	0.36	9.0	3/4/2020 1:05	3/4/2020 17:45	16.8	0.42	0.56	25,410
3/5/2020 18:45	3/6/2020 12:25	17.7	0.86	0.05	0.24	37.2	3/5/2020 18:45	3/7/2020 0:20	29.7	0.90	1.49	95,796
3/7/2020 11:35	3/7/2020 12:40	1.1	0.03	0.03	0.12	24.7	3/7/2020 11:35	3/7/2020 21:40	10.2	0.54	0.63	19,782
3/7/2020 21:45	3/8/2020 8:05	10.3	0.35	0.03	0.60	34.8	3/7/2020 21:40	3/8/2020 20:05	22.5	0.64	0.80	51,711
3/11/2020 4:00	3/11/2020 5:05	1.1	0.07	0.06	0.24	71.5	3/11/2020 3:55	3/11/2020 17:05	13.3	0.20	0.25	9,444
3/13/2020 5:40	3/13/2020 19:35	13.9	0.27	0.02	0.12	48.8	3/13/2020 5:35	3/14/2020 7:35	26.1	0.24	0.38	22,068
3/24/2020 14:50	3/25/2020 9:25	18.6	0.38	0.02	0.72	262.0	3/24/2020 14:45	3/25/2020 12:45	22.1	0.18	0.25	14,568
3/25/2020 12:50	3/25/2020 13:05	0.3	0.05	0.20	0.36	7.2	3/25/2020 12:45	3/26/2020 1:05	12.4	0.13	0.15	5,931
3/26/2020 11:55	3/26/2020 14:15	2.3	0.03	0.01	0.12	23.0	3/26/2020 11:55	3/27/2020 2:15	14.4	0.09	0.09	4,671
3/28/2020 2:25	3/28/2020 4:40	2.3	0.04	0.02	0.12	61.5	3/28/2020 2:25	3/28/2020 15:45	13.4	0.09	0.09	4,167
3/28/2020 15:50	3/29/2020 6:15	14.4	0.71	0.05	0.24	13.4	3/28/2020 15:45	3/29/2020 18:10	26.5	0.52	1.09	49,647

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 ($feet^3$)
3/30/2020 1:15	3/30/2020 5:00	3.8	0.33	0.09	0.48	20.6	3/30/2020 1:15	3/30/2020 12:10	11.0	0.63	0.89	24,819
3/30/2020 12:10	3/31/2020 4:30	16.3	0.38	0.02	0.48	7.5	3/30/2020 12:10	3/31/2020 14:45	26.7	0.63	0.80	60,840
3/31/2020 14:50	3/31/2020 17:50	3.0	0.13	0.04	0.24	17.1	3/31/2020 14:45	4/1/2020 3:45	13.1	0.52	0.63	24,327
4/1/2020 3:50	4/1/2020 14:40	10.8	0.23	0.02	0.24	10.2	4/1/2020 3:45	4/2/2020 2:35	22.9	0.49	0.63	40,611
4/3/2020 14:30	4/3/2020 20:10	5.7	0.17	0.03	0.24	47.9	4/3/2020 14:25	4/4/2020 8:10	17.8	0.33	0.43	21,018
4/11/2020 11:10	4/11/2020 12:25	1.3	0.06	0.05	0.12	183.9	4/11/2020 11:10	4/12/2020 0:20	13.3	0.06	0.06	2,859
4/18/2020 1:00	4/18/2020 10:00	9.0	0.06	0.01	0.12	157.7	4/18/2020 0:55	4/18/2020 21:55	21.1	0.05	0.05	3,795
4/22/2020 5:30	4/23/2020 8:40	27.2	1.08	0.04	0.24	95.2	4/22/2020 5:25	4/23/2020 16:05	34.8	0.41	0.89	51,741
4/23/2020 16:05	4/23/2020 22:15	6.2	0.29	0.05	0.36	13.2	4/23/2020 16:05	4/24/2020 10:15	18.3	0.57	0.80	37,707
4/25/2020 6:15	4/25/2020 10:15	4.0	0.38	0.10	0.48	33.3	4/25/2020 6:15	4/25/2020 22:15	16.1	0.65	1.18	37,740
4/26/2020 22:05	4/27/2020 1:55	3.8	0.11	0.03	0.12	36.8	4/26/2020 22:05	4/27/2020 13:50	15.8	0.24	0.28	13,959
4/29/2020 19:05	4/29/2020 19:35	0.5	0.03	0.06	0.12	66.0	4/29/2020 19:05	4/30/2020 7:30	12.5	0.08	0.09	3,678
5/2/2020 3:05	5/2/2020 6:35	3.5	0.12	0.03	0.24	122.0	5/2/2020 3:05	5/2/2020 10:15	7.3	0.10	0.13	2,523
5/2/2020 10:20	5/2/2020 15:30	5.2	0.43	0.08	0.48	6.7	5/2/2020 10:15	5/3/2020 3:30	17.3	0.44	0.80	27,699
5/5/2020 19:50	5/6/2020 9:10	13.3	0.30	0.02	1.08	77.7	5/5/2020 19:50	5/6/2020 21:10	25.4	0.17	0.28	15,450
5/11/2020 18:55	5/11/2020 21:45	2.8	0.08	0.03	0.24	130.2	5/11/2020 18:55	5/12/2020 9:40	14.8	0.05	0.06	2,715
5/13/2020 2:40	5/13/2020 6:10	3.5	0.03	0.01	0.12	29.9	5/13/2020 2:35	5/13/2020 18:10	15.7	0.05	0.05	2,820
5/14/2020 4:35	5/14/2020 8:50	4.3	0.17	0.04	0.36	55.8	5/14/2020 4:30	5/14/2020 20:45	16.3	0.08	0.11	4,878
5/16/2020 13:30	5/17/2020 7:20	17.8	0.66	0.04	0.48	53.9	5/16/2020 13:25	5/17/2020 19:15	29.9	0.32	0.71	34,500
5/20/2020 16:30	5/20/2020 20:05	3.6	0.11	0.03	0.12	86.9	5/20/2020 16:25	5/21/2020 1:50	9.5	0.08	0.11	2,826
5/21/2020 1:55	5/21/2020 17:10	15.3	1.01	0.07	0.60	6.3	5/21/2020 1:50	5/22/2020 5:10	27.4	0.66	1.18	65,442
5/22/2020 15:20	5/23/2020 4:55	13.6	0.24	0.02	0.24	22.3	5/22/2020 15:20	5/23/2020 16:50	25.6	0.34	0.49	31,467
5/25/2020 4:10	5/25/2020 18:50	14.7	0.24	0.02	0.12	49.1	5/25/2020 4:05	5/26/2020 6:45	26.8	0.21	0.33	20,469
5/30/2020 7:10	5/31/2020 11:15	28.1	1.50	0.05	0.48	117.7	5/30/2020 7:05	5/31/2020 23:10	40.2	0.88	1.99	127,818
6/5/2020 20:30	6/5/2020 20:35	0.1	0.12	1.44	0.84	130.9	6/5/2020 20:25	6/6/2020 8:35	12.3	0.10	0.13	4,566
6/6/2020 23:00	6/7/2020 10:25	11.4	0.70	0.06	0.60	26.4	6/6/2020 23:00	6/7/2020 22:25	23.5	0.53	0.80	44,871
6/9/2020 0:10	6/9/2020 12:35	12.4	0.29	0.02	0.12	40.9	6/9/2020 0:10	6/9/2020 18:40	18.6	0.28	0.38	18,825
6/9/2020 18:45	6/9/2020 20:15	1.5	0.03	0.02	0.12	8.7	6/9/2020 18:40	6/10/2020 8:10	13.6	0.22	0.28	10,614
6/11/2020 9:15	6/11/2020 12:05	2.8	0.21	0.07	0.24	47.2	6/11/2020 9:10	6/12/2020 0:05	15.0	0.28	0.43	14,937
6/12/2020 11:35	6/12/2020 14:55	3.3	0.25	0.08	0.24	24.6	6/12/2020 11:35	6/12/2020 21:10	9.7	0.39	0.56	13,614
6/12/2020 21:15	6/13/2020 0:30	3.3	0.10	0.03	0.24	6.8	6/12/2020 21:10	6/13/2020 12:30	15.4	0.37	0.49	20,274
6/13/2020 20:20	6/13/2020 23:50	3.5	0.35	0.10	0.36	20.6	6/13/2020 20:15	6/14/2020 11:50	15.7	0.70	1.18	39,696

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 ($feet^3$)
10/3/2019 1:40	10/3/2019 2:45	1.1	0.03	0.03	0.12	95.8	10/3/2019 1:40	10/3/2019 14:45	13.2	0.02	0.02	903
10/3/2019 17:25	10/3/2019 17:50	0.4	0.03	0.07	0.12	111.6	10/3/2019 17:25	10/4/2019 2:25	9.1	0.01	0.02	456
10/4/2019 2:30	10/4/2019 4:50	2.3	0.04	0.02	0.12	120.7	10/4/2019 2:25	10/4/2019 16:50	14.5	0.02	0.03	1,023
10/7/2019 18:45	10/8/2019 15:45	21.0	0.65	0.03	1.32	88.2	10/7/2019 18:40	10/9/2019 3:40	33.1	0.09	0.32	10,812
10/16/2019 5:15	10/16/2019 9:50	4.6	0.13	0.03	0.12	186.7	10/16/2019 5:10	10/16/2019 15:40	10.6	0.03	0.06	1,167
10/16/2019 15:40	10/16/2019 20:10	4.5	0.23	0.05	0.24	6.7	10/16/2019 15:40	10/17/2019 4:15	12.7	0.07	0.18	3,093
10/17/2019 4:20	10/17/2019 17:40	13.3	0.10	0.01	0.12	11.5	10/17/2019 4:15	10/18/2019 5:35	25.4	0.02	0.03	1,662
10/18/2019 15:10	10/19/2019 12:25	21.3	1.03	0.05	0.48	25.3	10/18/2019 15:10	10/20/2019 0:20	33.3	0.19	0.46	22,917
10/20/2019 7:05	10/21/2019 0:30	17.4	0.30	0.02	0.48	19.9	10/20/2019 7:05	10/21/2019 7:50	24.8	0.13	0.27	11,922
10/21/2019 7:50	10/22/2019 5:20	21.5	0.93	0.04	0.48	9.5	10/21/2019 7:50	10/22/2019 17:20	33.6	0.33	0.65	39,474
10/25/2019 9:40	10/25/2019 20:50	11.2	0.33	0.03	0.36	77.8	10/25/2019 9:40	10/26/2019 8:45	23.2	0.09	0.18	7,722
11/9/2019 0:40	11/9/2019 16:25	15.8	0.33	0.02	0.24	339.9	11/9/2019 0:40	11/10/2019 4:25	27.8	0.05	0.11	4,521
11/12/2019 3:55	11/12/2019 7:50	3.9	0.30	0.08	0.12	60.4	11/12/2019 3:55	11/12/2019 19:50	16.0	0.08	0.21	4,830
11/15/2019 3:40	11/15/2019 5:40	2.0	0.19	0.10	0.24	68.5	11/15/2019 3:40	11/15/2019 17:25	13.8	0.07	0.15	3,273
11/15/2019 17:25	11/15/2019 19:40	2.3	0.81	0.36	0.96	12.4	11/15/2019 17:25	11/16/2019 7:40	14.3	0.35	0.93	18,039
11/16/2019 14:35	11/16/2019 18:15	3.7	0.07	0.02	0.12	19.0	11/16/2019 14:35	11/16/2019 23:25	8.9	0.12	0.15	3,993
11/16/2019 23:25	11/17/2019 20:50	21.4	0.40	0.02	0.36	6.6	11/16/2019 23:25	11/18/2019 8:45	33.4	0.17	0.27	20,280
11/18/2019 11:50	11/19/2019 1:55	14.1	0.41	0.03	0.24	16.3	11/18/2019 11:50	11/19/2019 3:20	15.6	0.28	0.46	15,627
11/19/2019 3:25	11/19/2019 9:55	6.5	0.11	0.02	0.12	7.1	11/19/2019 3:20	11/19/2019 21:55	18.7	0.18	0.27	12,354
11/23/2019 23:00	11/24/2019 5:50	6.8	0.12	0.02	0.12	111.9	11/23/2019 23:00	11/24/2019 17:45	18.8	0.06	0.11	4,305
11/24/2019 21:25	11/25/2019 8:30	11.1	0.52	0.05	0.60	20.1	11/24/2019 21:20	11/25/2019 15:00	17.8	0.17	0.27	10,791
11/25/2019 15:05	11/26/2019 4:20	13.3	0.21	0.02	0.24	7.4	11/25/2019 15:00	11/26/2019 16:15	25.3	0.15	0.27	14,025
12/1/2019 11:25	12/1/2019 13:40	2.3	0.03	0.01	0.12	133.9	12/1/2019 11:25	12/2/2019 1:40	14.3	0.04	0.04	1,998
12/6/2019 20:20	12/7/2019 16:45	20.4	0.39	0.02	0.12	262.8	12/6/2019 20:15	12/8/2019 4:40	32.5	0.11	0.21	12,897
12/10/2019 11:30	12/10/2019 21:55	10.4	0.21	0.02	0.12	72.6	12/10/2019 11:25	12/11/2019 9:55	22.6	0.10	0.13	7,935
12/11/2019 9:55	12/12/2019 0:15	14.3	0.34	0.02	0.12	14.9	12/11/2019 9:55	12/12/2019 6:10	20.3	0.17	0.27	12,495
12/12/2019 6:10	12/12/2019 9:05	2.9	0.04	0.01	0.12	7.5	12/12/2019 6:10	12/12/2019 13:40	7.6	0.15	0.15	3,960
12/12/2019 13:45	12/12/2019 17:30	3.8	0.11	0.03	0.24	7.6	12/12/2019 13:40	12/13/2019 5:25	15.8	0.14	0.21	8,202
12/13/2019 23:55	12/14/2019 15:55	16.0	0.50	0.03	0.84	33.4	12/13/2019 23:55	12/14/2019 23:35	23.8	0.23	0.41	19,935
12/14/2019 23:35	12/15/2019 7:15	7.7	0.10	0.01	0.12	8.0	12/14/2019 23:35	12/15/2019 19:15	19.8	0.17	0.20	11,949
12/18/2019 18:00	12/19/2019 7:25	13.4	0.32	0.02	0.12	84.0	12/18/2019 17:55	12/19/2019 12:10	18.3	0.17	0.27	10,950
12/19/2019 12:10	12/21/2019 18:50	54.7	4.87	0.09	1.44	11.8	12/19/2019 12:10	12/22/2019 6:45	66.7	1.67	4.52	401,308
12/22/2019 16:55	12/23/2019 4:00	11.1	0.19	0.02	0.12	27.6	12/22/2019 16:55	12/23/2019 16:00	23.2	0.44	0.62	36,516
12/30/2019 4:45	12/30/2019 7:20	2.6	0.05	0.02	0.12	171.4	12/30/2019 4:40	12/30/2019 19:20	14.8	0.10	0.10	5,118
12/31/2019 8:10	12/31/2019 15:25	7.3	0.07	0.01	0.24	26.9	12/31/2019 8:10	1/1/2020 3:25	17.4	0.10	0.13	6,276
1/1/2020 7:10	1/1/2020 8:15	1.1	0.37	0.34	1.08	15.9	1/1/2020 7:05	1/1/2020 19:25	12.4	0.25	0.41	11,004
1/1/2020 19:30	1/2/2020 7:30	12.0	0.50	0.04	0.48	11.9	1/1/2020 19:25	1/2/2020 11:55	16.6	0.39	0.59	23,088
1/2/2020 11:55	1/2/2020 19:40	7.8	0.11	0.01	0.12	10.9	1/2/2020 11:55	1/3/2020 7:40	19.8	0.23	0.28	16,755
1/3/2020 20:15	1/4/2020 1:05	4.8	0.30	0.06	0.12	28.3	1/3/2020 20:10	1/4/2020 13:05	17.0	0.28	0.51	16,938
1/4/2020 15:30	1/4/2020 16:50	1.3	0.03	0.02	0.12	15.4	1/4/2020 15:30	1/5/2020 3:30	12.1	0.17	0.18	7,419
1/5/2020 3:30	1/5/2020 15:15	11.8	0.30	0.03	0.24	27.4	1/5/2020 3:30	1/6/2020 2:20	22.9	0.23	0.35	18,822
1/6/2020 2:20	1/6/2020 8:00	5.7	0.03	0.01	0.12	11.5	1/6/2020 2:20	1/6/2020 13:30	11.3	0.18	0.20	7,452
1/6/2020 13:35	1/7/2020 9:00	19.4	0.33	0.02	0.12	22.8	1/6/2020 13:30	1/7/2020 15:40	26.3	0.25	0.37	23,460
1/7/2020 15:40	1/7/2020 21:05	5.4	0.08	0.01	0.12	10.2	1/7/2020 15:40	1/8/2020 9:00	17.4	0.22	0.25	13,668

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 ($feet^3$)
1/8/2020 18:15	1/8/2020 21:55	3.7	0.04	0.01	0.12	24.9	1/8/2020 18:10	1/9/2020 6:55	12.8	0.16	0.18	7,419
1/9/2020 7:00	1/9/2020 10:10	3.2	0.08	0.03	0.12	12.8	1/9/2020 6:55	1/9/2020 22:05	15.3	0.16	0.20	8,838
1/10/2020 3:00	1/10/2020 21:50	18.8	0.42	0.02	0.12	18.4	1/10/2020 2:55	1/11/2020 4:40	25.8	0.27	0.37	24,903
1/11/2020 4:40	1/12/2020 1:50	21.2	0.73	0.03	0.36	9.2	1/11/2020 4:40	1/12/2020 9:10	28.6	0.48	1.04	49,689
1/12/2020 9:10	1/12/2020 20:20	11.2	0.41	0.04	0.24	10.3	1/12/2020 9:10	1/13/2020 8:15	23.2	0.44	0.77	36,642
1/15/2020 11:30	1/16/2020 12:25	24.9	0.80	0.03	0.24	64.2	1/15/2020 11:25	1/17/2020 0:20	37.0	0.20	0.23	26,799
1/17/2020 20:30	1/18/2020 10:45	14.3	0.35	0.02	0.24	32.2	1/17/2020 20:25	1/18/2020 22:45	26.4	0.39	0.70	37,512
1/21/2020 3:35	1/21/2020 22:40	19.1	0.81	0.04	0.36	67.9	1/21/2020 3:30	1/22/2020 8:35	29.2	0.43	1.08	44,832
1/22/2020 8:35	1/23/2020 0:40	16.1	0.30	0.02	0.12	10.8	1/22/2020 8:35	1/23/2020 5:10	20.7	0.40	0.56	29,538
1/23/2020 5:15	1/24/2020 7:55	26.7	0.99	0.04	0.36	10.3	1/23/2020 5:10	1/24/2020 10:50	29.8	0.68	1.04	73,344
1/24/2020 10:50	1/25/2020 8:10	21.3	0.27	0.01	0.12	7.2	1/24/2020 10:50	1/25/2020 12:40	25.9	0.46	0.65	42,924
1/25/2020 12:45	1/25/2020 15:05	2.3	0.04	0.02	0.12	8.7	1/25/2020 12:40	1/26/2020 1:15	12.7	0.34	0.39	15,348
1/26/2020 1:20	1/26/2020 11:20	10.0	0.30	0.03	0.24	12.6	1/26/2020 1:15	1/26/2020 19:45	18.6	0.43	0.70	28,902
1/26/2020 19:45	1/26/2020 21:20	1.6	0.05	0.03	0.12	14.3	1/26/2020 19:45	1/27/2020 9:20	13.7	0.30	0.37	14,727
1/27/2020 17:15	1/28/2020 11:10	17.9	0.96	0.05	0.36	21.5	1/27/2020 17:10	1/28/2020 20:35	27.5	0.71	1.31	69,912
1/28/2020 20:35	1/29/2020 0:50	4.3	0.03	0.01	0.12	12.9	1/28/2020 20:35	1/29/2020 10:05	13.6	0.37	0.43	17,922
1/29/2020 10:05	1/29/2020 17:25	7.3	0.10	0.01	0.12	26.4	1/29/2020 10:05	1/30/2020 5:25	19.4	0.31	0.41	21,996
1/30/2020 15:10	1/31/2020 3:30	12.3	0.16	0.01	0.12	27.1	1/30/2020 15:10	1/31/2020 8:15	17.2	0.29	0.35	17,919
1/31/2020 8:15	2/2/2020 1:10	40.9	1.33	0.03	0.24	10.4	1/31/2020 8:15	2/2/2020 10:50	50.7	0.58	1.27	105,675
2/2/2020 10:50	2/2/2020 11:35	0.8	0.03	0.04	0.12	10.2	2/2/2020 10:50	2/2/2020 23:35	12.8	0.35	0.41	16,173
2/3/2020 0:25	2/3/2020 2:10	1.8	0.08	0.05	0.12	23.8	2/3/2020 0:20	2/3/2020 14:10	13.9	0.31	0.41	15,726
2/4/2020 12:15	2/7/2020 10:30	70.3	4.55	0.06	0.24	34.6	2/4/2020 12:10	2/7/2020 15:20	75.3	1.84	3.78	497,493
2/7/2020 15:20	2/7/2020 20:35	5.3	0.23	0.04	0.24	7.1	2/7/2020 15:20	2/8/2020 3:45	12.5	0.91	1.20	40,929
2/8/2020 3:50	2/8/2020 13:35	9.8	0.20	0.02	0.24	9.0	2/8/2020 3:45	2/9/2020 1:30	21.8	0.67	1.00	52,872
2/13/2020 15:55	2/13/2020 19:35	3.7	0.13	0.04	0.36	128.1	2/13/2020 15:55	2/14/2020 7:30	15.7	0.24	0.28	13,509
2/14/2020 21:35	2/15/2020 3:10	5.6	0.06	0.01	0.12	26.8	2/14/2020 21:35	2/15/2020 15:10	17.7	0.19	0.21	12,024
2/15/2020 19:55	2/16/2020 3:50	7.9	0.28	0.04	0.48	20.5	2/15/2020 19:50	2/16/2020 14:55	19.2	0.25	0.41	17,460
2/16/2020 15:00	2/16/2020 17:15	2.3	0.08	0.04	0.12	15.4	2/16/2020 14:55	2/17/2020 5:10	14.3	0.20	0.27	10,572
2/23/2020 4:50	2/23/2020 7:35	2.8	0.15	0.05	0.36	156.8	2/23/2020 4:50	2/23/2020 19:30	14.8	0.16	0.25	8,568
2/28/2020 16:50	2/28/2020 23:55	7.1	0.10	0.01	0.12	129.3	2/28/2020 16:50	2/29/2020 11:55	19.2	0.13	0.15	8,706
3/1/2020 0:00	3/1/2020 4:50	4.8	0.07	0.01	0.12	30.1	2/29/2020 23:55	3/1/2020 16:50	17.0	0.11	0.13	6,861
3/1/2020 19:10	3/1/2020 21:15	2.1	0.09	0.04	0.12	14.8	3/1/2020 19:05	3/2/2020 3:30	8.5	0.14	0.17	4,248
3/2/2020 3:30	3/3/2020 6:05	26.6	0.46	0.02	0.12	7.0	3/2/2020 3:30	3/3/2020 16:05	36.7	0.19	0.37	25,542
3/3/2020 16:10	3/3/2020 16:45	0.6	0.04	0.07	0.12	11.2	3/3/2020 16:05	3/4/2020 1:05	9.1	0.17	0.21	5,493
3/4/2020 1:10	3/4/2020 5:45	4.6	0.21	0.05	0.36	9.0	3/4/2020 1:05	3/4/2020 17:45	16.8	0.21	0.35	12,876
3/5/2020 18:45	3/6/2020 12:25	17.7	0.86	0.05	0.24	37.2	3/5/2020 18:45	3/7/2020 0:20	29.7	0.42	0.90	45,270
3/7/2020 11:35	3/7/2020 12:40	1.1	0.03	0.03	0.12	24.7	3/7/2020 11:35	3/7/2020 21:40	10.2	0.20	0.27	7,323
3/7/2020 21:45	3/8/2020 8:05	10.3	0.35	0.03	0.60	34.8	3/7/2020 21:40	3/8/2020 20:05	22.5	0.28	0.46	23,019
3/11/2020 4:00	3/11/2020 5:05	1.1	0.07	0.06	0.24	71.5	3/11/2020 3:55	3/11/2020 17:05	13.3	0.15	0.20	7,206
3/13/2020 5:40	3/13/2020 19:35	13.9	0.27	0.02	0.12	48.8	3/13/2020 5:35	3/14/2020 7:35	26.1	0.16	0.23	15,393
3/24/2020 14:50	3/25/2020 9:25	18.6	0.38	0.02	0.72	262.0	3/24/2020 14:45	3/25/2020 12:45	22.1	0.13	0.17	10,641
3/25/2020 12:50	3/25/2020 13:05	0.3	0.05	0.20	0.36	7.2	3/25/2020 12:45	3/26/2020 1:05	12.4	0.11	0.14	4,872
3/26/2020 11:55	3/26/2020 14:15	2.3	0.03	0.01	0.12	23.0	3/26/2020 11:55	3/27/2020 2:15	14.4	0.10	0.10	5,169
3/28/2020 2:25	3/28/2020 4:40	2.3	0.04	0.02	0.12	61.5	3/28/2020 2:25	3/28/2020 15:45	13.4	0.10	0.11	4,770
3/28/2020 15:50	3/29/2020 6:15	14.4	0.71	0.05	0.24	13.4	3/28/2020 15:45	3/29/2020 18:10	26.5	0.31	0.77	29,871

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 ($feet^3$)
3/30/2020 1:15	3/30/2020 5:00	3.8	0.33	0.09	0.48	20.6	3/30/2020 1:15	3/30/2020 12:10	11.0	0.35	0.65	13,680
3/30/2020 12:10	3/31/2020 4:30	16.3	0.38	0.02	0.48	7.5	3/30/2020 12:10	3/31/2020 14:45	26.7	0.33	0.74	31,896
3/31/2020 14:50	3/31/2020 17:50	3.0	0.13	0.04	0.24	17.1	3/31/2020 14:45	4/1/2020 3:45	13.1	0.24	0.30	11,511
4/1/2020 3:50	4/1/2020 14:40	10.8	0.23	0.02	0.24	10.2	4/1/2020 3:45	4/2/2020 2:35	22.9	0.25	0.37	20,229
4/3/2020 14:30	4/3/2020 20:10	5.7	0.17	0.03	0.24	47.9	4/3/2020 14:25	4/4/2020 8:10	17.8	0.19	0.23	12,075
4/11/2020 11:10	4/11/2020 12:25	1.3	0.06	0.05	0.12	183.9	4/11/2020 11:10	4/12/2020 0:20	13.3	0.09	0.11	4,458
4/18/2020 1:00	4/18/2020 10:00	9.0	0.06	0.01	0.12	157.7	4/18/2020 0:55	4/18/2020 21:55	21.1	0.07	0.09	5,574
4/22/2020 5:30	4/23/2020 8:40	27.2	1.08	0.04	0.24	95.2	4/22/2020 5:25	4/23/2020 16:05	34.8	0.24	0.46	29,628
4/23/2020 16:05	4/23/2020 22:15	6.2	0.29	0.05	0.36	13.2	4/23/2020 16:05	4/24/2020 10:15	18.3	0.22	0.30	14,487
4/25/2020 6:15	4/25/2020 10:15	4.0	0.38	0.10	0.48	33.3	4/25/2020 6:15	4/25/2020 22:15	16.1	0.24	0.53	14,115
4/26/2020 22:05	4/27/2020 1:55	3.8	0.11	0.03	0.12	36.8	4/26/2020 22:05	4/27/2020 13:50	15.8	0.14	0.18	7,785
4/29/2020 19:05	4/29/2020 19:35	0.5	0.03	0.06	0.12	66.0	4/29/2020 19:05	4/30/2020 7:30	12.5	0.09	0.10	4,110
5/2/2020 3:05	5/2/2020 6:35	3.5	0.12	0.03	0.24	122.0	5/2/2020 3:05	5/2/2020 10:15	7.3	0.10	0.15	2,655
5/2/2020 10:20	5/2/2020 15:30	5.2	0.43	0.08	0.48	6.7	5/2/2020 10:15	5/3/2020 3:30	17.3	0.17	0.46	10,839
5/5/2020 19:50	5/6/2020 9:10	13.3	0.30	0.02	1.08	77.7	5/5/2020 19:50	5/6/2020 21:10	25.4	0.09	0.17	8,508
5/11/2020 18:55	5/11/2020 21:45	2.8	0.08	0.03	0.24	130.2	5/11/2020 18:55	5/12/2020 9:40	14.8	0.05	0.06	2,436
5/13/2020 2:40	5/13/2020 6:10	3.5	0.03	0.01	0.12	29.9	5/13/2020 2:35	5/13/2020 18:10	15.7	0.04	0.04	2,142
5/14/2020 4:35	5/14/2020 8:50	4.3	0.17	0.04	0.36	55.8	5/14/2020 4:30	5/14/2020 20:45	16.3	0.07	0.15	4,017
5/16/2020 13:30	5/17/2020 7:20	17.8	0.66	0.04	0.48	53.9	5/16/2020 13:25	5/17/2020 19:15	29.9	0.13	0.46	14,253
5/20/2020 16:30	5/20/2020 20:05	3.6	0.11	0.03	0.12	86.9	5/20/2020 16:25	5/21/2020 1:50	9.5	0.07	0.10	2,433
5/21/2020 1:55	5/21/2020 17:10	15.3	1.01	0.07	0.60	6.3	5/21/2020 1:50	5/22/2020 5:10	27.4	0.26	0.80	25,977
5/22/2020 15:20	5/23/2020 4:55	13.6	0.24	0.02	0.24	22.3	5/22/2020 15:20	5/23/2020 16:50	25.6	0.13	0.23	12,297
5/25/2020 4:10	5/25/2020 18:50	14.7	0.24	0.02	0.12	49.1	5/25/2020 4:05	5/26/2020 6:45	26.8	0.11	0.18	10,707
5/30/2020 7:10	5/31/2020 11:15	28.1	1.50	0.05	0.48	117.7	5/30/2020 7:05	5/31/2020 23:10	40.2	0.31	0.90	44,298
6/5/2020 20:30	6/5/2020 20:35	0.1	0.12	1.44	0.84	130.9	6/5/2020 20:25	6/6/2020 8:35	12.3	0.09	0.14	3,966
6/6/2020 23:00	6/7/2020 10:25	11.4	0.70	0.06	0.60	26.4	6/6/2020 23:00	6/7/2020 22:25	23.5	0.21	0.53	17,628
6/9/2020 0:10	6/9/2020 12:35	12.4	0.29	0.02	0.12	40.9	6/9/2020 0:10	6/9/2020 18:40	18.6	0.14	0.18	9,447
6/9/2020 18:45	6/9/2020 20:15	1.5	0.03	0.02	0.12	8.7	6/9/2020 18:40	6/10/2020 8:10	13.6	0.11	0.13	5,241
6/11/2020 9:15	6/11/2020 12:05	2.8	0.21	0.07	0.24	47.2	6/11/2020 9:10	6/12/2020 0:05	15.0	0.13	0.28	6,803
6/12/2020 11:35	6/12/2020 14:55	3.3	0.25	0.08	0.24	24.6	6/12/2020 11:35	6/12/2020 21:10	9.7	0.18	0.30	6,288
6/12/2020 21:15	6/13/2020 0:30	3.3	0.10	0.03	0.24	6.8	6/12/2020 21:10	6/13/2020 12:30	15.4	0.15	0.21	8,301
6/13/2020 20:20	6/13/2020 23:50	3.5	0.35	0.10	0.36	20.6	6/13/2020 20:15	6/14/2020 11:50	15.7	0.20	0.46	11,209

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)
10/3/2019 1:35	10/3/2019 4:45	3.2	0.03	0.01	0.12	96.3	10/3/2019 1:30	10/3/2019 14:30	13.1	0.24	0.31	11,214
10/3/2019 14:30	10/3/2019 17:30	3.0	0.05	0.02	0.12	109.2	10/3/2019 14:30	10/4/2019 2:10	11.8	0.28	0.55	
10/4/2019 2:15	10/4/2019 4:05	1.8	0.05	0.03	0.12	9.0	10/4/2019 2:10	10/4/2019 16:05	14.0	0.30	0.50	
10/7/2019 19:10	10/8/2019 16:00	20.8	0.39	0.02	0.24	88.8	10/7/2019 19:10	10/9/2019 4:00	32.9	0.47	1.29	
10/16/2019 5:05	10/16/2019 9:40	4.6	0.17	0.04	0.24	186.4	10/16/2019 5:00	10/16/2019 15:40	10.8	0.48	1.21	
10/16/2019 15:40	10/16/2019 20:15	4.6	0.30	0.07	0.48	6.8	10/16/2019 15:40	10/17/2019 4:15	12.7	0.77	3.01	
10/17/2019 4:15	10/17/2019 17:00	12.8	0.13	0.01	0.24	8.5	10/17/2019 4:15	10/18/2019 5:00	24.8	0.34	0.92	
10/18/2019 6:00	10/18/2019 6:15	0.3	0.03	0.12	0.12	16.2	10/18/2019 6:00	10/18/2019 14:40	8.8	0.25	0.31	
10/18/2019 14:40	10/19/2019 14:20	23.7	1.03	0.04	0.48	24.8	10/18/2019 14:40	10/20/2019 2:15	35.7	1.14	3.19	
10/20/2019 7:15	10/21/2019 3:50	20.6	0.56	0.03	0.84	20.2	10/20/2019 7:15	10/21/2019 7:40	24.5	0.94	3.75	
10/21/2019 7:45	10/22/2019 7:50	24.1	1.00	0.04	0.24	9.7	10/21/2019 7:40	10/22/2019 19:50	36.3	1.46	3.37	
10/25/2019 9:40	10/25/2019 19:15	9.6	0.28	0.03	0.36	76.6	10/25/2019 9:40	10/26/2019 7:15	21.7	0.67	1.81	
11/9/2019 0:40	11/9/2019 15:35	14.9	0.24	0.02	0.12	341.6	11/9/2019 0:40	11/10/2019 3:30	26.9	0.56	1.69	
11/12/2019 3:55	11/12/2019 7:50	3.9	0.29	0.07	0.24	60.8	11/12/2019 3:55	11/12/2019 19:50	16.0	0.80	2.52	
11/15/2019 3:35	11/15/2019 6:10	2.6	0.20	0.08	0.24	68.5	11/15/2019 3:30	11/15/2019 18:10	14.8	0.63	2.68	
11/16/2019 14:35	11/16/2019 18:15	3.7	0.08	0.02	0.12	33.6	11/16/2019 14:35	11/16/2019 23:25	8.9	0.48	0.85	
11/16/2019 23:30	11/17/2019 20:50	21.3	0.38	0.02	0.24	6.7	11/16/2019 23:25	11/18/2019 8:45	33.4	0.70	2.08	
11/18/2019 11:40	11/19/2019 10:00	22.3	0.88	0.04	0.60	16.8	11/18/2019 11:35	11/19/2019 21:55	34.4	1.56	7.10	
11/24/2019 0:15	11/24/2019 2:30	2.3	0.11	0.05	0.12	113.2	11/24/2019 0:10	11/24/2019 14:25	14.3	0.54	1.14	
11/25/2019 0:25	11/25/2019 9:10	8.8	0.06	0.01	0.12	22.9	11/25/2019 0:20	11/25/2019 15:20	15.1	0.40	0.50	
11/25/2019 15:25	11/25/2019 21:10	5.8	0.03	0.01	0.12	10.2	11/25/2019 15:20	11/26/2019 9:10	17.9	0.37	0.43	
12/1/2019 11:25	12/1/2019 13:20	1.9	0.03	0.02	0.12	150.2	12/1/2019 11:25	12/2/2019 1:15	13.9	0.32	0.37	
12/4/2019 6:05	12/4/2019 7:45	1.7	0.03	0.02	0.12	216.8	12/4/2019 6:00	12/4/2019 19:40	13.8	0.33	0.37	
12/7/2019 0:00	12/7/2019 13:35	13.6	0.39	0.03	0.24	282.8	12/6/2019 23:55	12/8/2019 1:30	25.7	0.74	1.57	
12/10/2019 11:30	12/10/2019 23:00	11.5	0.20	0.02	0.12	74.3	12/10/2019 11:25	12/11/2019 9:40	22.3	0.55	0.92	
12/11/2019 9:45	12/12/2019 14:35	28.8	0.54	0.02	0.24	15.2	12/11/2019 9:40	12/13/2019 2:35	41.0	0.80	1.29	
12/13/2019 17:45	12/13/2019 22:35	4.8	0.06	0.01	0.24	27.4	12/13/2019 17:45	12/14/2019 4:15	10.6	0.49	0.67	
12/14/2019 4:20	12/14/2019 13:35	9.3	0.17	0.02	0.24	10.5	12/14/2019 4:15	12/14/2019 23:35	19.4	0.67	1.14	
12/14/2019 23:40	12/15/2019 12:50	13.2	0.17	0.01	0.24	11.7	12/14/2019 23:35	12/16/2019 0:45	25.3	0.74	1.45	
12/18/2019 18:10	12/19/2019 2:40	8.5	0.36	0.04	0.12	83.8	12/18/2019 18:10	12/19/2019 11:55	17.8	0.92	1.57	
12/19/2019 11:55	12/21/2019 15:10	51.3	5.04	0.10	1.44	10.8	12/19/2019 11:55	12/22/2019 3:10	63.3	6.73	16.05	
12/22/2019 16:55	12/23/2019 8:15	15.3	0.40	0.03	0.12	28.3	12/22/2019 16:55	12/23/2019 20:10	27.3	1.32	3.01	
12/26/2019 21:40	12/27/2019 0:35	2.9	0.03	0.01	0.12	89.7	12/26/2019 21:40	12/27/2019 12:30	14.9	0.37	0.43	
12/30/2019 4:40	12/30/2019 7:40	3.0	0.06	0.02	0.12	168.7	12/30/2019 4:40	12/30/2019 19:40	15.1	0.34	0.55	
12/31/2019 11:40	12/31/2019 15:25	3.8	0.09	0.02	0.24	29.9	12/31/2019 11:35	1/1/2020 2:25	13.9	0.47	1.06	
1/1/2020 2:25	1/1/2020 8:15	5.8	0.18	0.03	0.60	11.2	1/1/2020 2:25	1/1/2020 19:55	17.6	0.60	1.57	
1/1/2020 19:55	1/2/2020 3:50	7.9	0.65	0.08	0.36	12.2	1/1/2020 19:55	1/2/2020 11:00	15.2	1.97	5.03	
1/2/2020 11:00	1/2/2020 20:05	9.1	0.12	0.01	0.12	8.4	1/2/2020 11:00	1/3/2020 8:05	21.2	0.94	1.45	
1/3/2020 19:55	1/4/2020 1:45	5.8	0.34	0.06	0.24	28.4	1/3/2020 19:50	1/4/2020 13:45	18.0	1.11	3.95	
1/4/2020 15:25	1/4/2020 16:25	1.0	0.04	0.04	0.24	15.3	1/4/2020 15:20	1/5/2020 3:25	12.2	0.62	0.79	
1/5/2020 3:25	1/5/2020 11:35	8.2	0.20	0.02	0.24	12.0	1/5/2020 3:25	1/5/2020 23:35	20.3	0.72	1.45	
1/6/2020 2:25	1/6/2020 7:05	4.7	0.03	0.01	0.12	15.3	1/6/2020 2:25	1/6/2020 14:10	11.8	0.59	0.61	
1/6/2020 14:10	1/7/2020 9:00	18.8	0.42	0.02	0.12	27.1	1/6/2020 14:10	1/7/2020 15:45	25.7	1.04	2.22	
1/7/2020 15:50	1/7/2020 20:45	4.9	0.13	0.03	0.36	10.3	1/7/2020 15:45	1/8/2020 8:45	17.1	0.87	1.69	

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)
1/9/2020 6:15	1/9/2020 10:45	4.5	0.09	0.02	0.12	34.4	1/9/2020 6:10	1/9/2020 22:40	16.6	0.58	0.79	
1/10/2020 2:40	1/10/2020 23:30	20.8	0.46	0.02	0.12	18.4	1/10/2020 2:35	1/11/2020 3:45	25.3	0.97	1.37	
1/11/2020 3:50	1/11/2020 13:25	9.6	0.68	0.07	0.96	7.6	1/11/2020 3:45	1/11/2020 19:25	15.8	2.72	11.78	
1/11/2020 19:30	1/12/2020 4:15	8.8	0.12	0.01	0.12	7.2	1/11/2020 19:25	1/12/2020 6:20	11.0	1.39	1.94	
1/12/2020 6:20	1/12/2020 14:45	8.4	0.12	0.01	0.12	7.3	1/12/2020 6:20	1/13/2020 2:45	20.5	0.93	1.29	
1/15/2020 12:10	1/16/2020 12:10	24.0	0.50	0.02	0.24	69.9	1/15/2020 12:10	1/17/2020 0:10	36.1	0.59	0.85	
1/18/2020 0:45	1/18/2020 8:45	8.0	0.49	0.06	0.24	37.1	1/18/2020 0:40	1/18/2020 20:45	20.2	1.56	4.15	
1/19/2020 11:20	1/19/2020 12:25	1.1	0.03	0.03	0.12	28.3	1/19/2020 11:15	1/20/2020 0:25	13.3	0.58	0.73	
1/21/2020 3:20	1/21/2020 22:25	19.1	0.77	0.04	0.36	68.3	1/21/2020 3:20	1/22/2020 8:20	29.1	1.48	4.58	
1/22/2020 8:20	1/23/2020 0:55	16.6	0.30	0.02	0.12	10.4	1/22/2020 8:20	1/23/2020 5:45	21.5	1.32	1.94	
1/23/2020 5:45	1/25/2020 10:50	53.1	1.41	0.03	1.20	15.7	1/23/2020 5:45	1/25/2020 13:50	56.2	1.99	5.76	
1/25/2020 13:50	1/25/2020 15:10	1.3	0.03	0.02	0.12	8.2	1/25/2020 13:50	1/26/2020 1:15	11.5	0.96	1.29	
1/26/2020 1:20	1/26/2020 11:15	9.9	0.32	0.03	0.24	14.5	1/26/2020 1:15	1/26/2020 20:15	19.1	1.34	2.52	
1/26/2020 20:20	1/27/2020 1:30	5.2	0.05	0.01	0.12	9.3	1/26/2020 20:15	1/27/2020 13:25	17.3	0.75	1.14	
1/27/2020 17:05	1/28/2020 9:30	16.4	1.08	0.07	0.36	20.8	1/27/2020 17:05	1/28/2020 19:15	26.3	2.46	10.20	
1/28/2020 19:20	1/28/2020 20:50	1.5	0.04	0.03	0.12	11.5	1/28/2020 19:15	1/29/2020 7:05	11.9	1.06	1.29	
1/29/2020 7:05	1/29/2020 12:10	5.1	0.11	0.02	0.12	11.8	1/29/2020 7:05	1/30/2020 0:10	17.2	0.82	1.21	
1/30/2020 18:00	1/30/2020 23:00	5.0	0.15	0.03	0.12	30.8	1/30/2020 17:55	1/31/2020 4:25	10.6	0.89	1.21	
1/31/2020 4:30	2/1/2020 7:50	27.3	1.10	0.04	0.36	7.0	1/31/2020 4:25	2/1/2020 14:55	34.6	1.81	7.69	
2/1/2020 15:00	2/2/2020 2:05	11.1	0.15	0.01	0.12	7.8	2/1/2020 14:55	2/2/2020 14:00	23.2	1.26	1.94	
2/3/2020 0:40	2/3/2020 4:10	3.5	0.09	0.03	0.12	23.3	2/3/2020 0:40	2/3/2020 16:10	15.6	0.68	0.99	
2/4/2020 11:50	2/7/2020 9:35	69.8	4.61	0.07	0.24	33.8	2/4/2020 11:50	2/7/2020 15:10	75.4	5.43	13.47	
2/7/2020 15:15	2/8/2020 13:55	22.7	0.63	0.03	0.84	8.9	2/7/2020 15:10	2/9/2020 1:50	34.8	1.80	3.55	
2/11/2020 23:25	2/11/2020 23:45	0.3	0.10	0.30	0.60	84.0	2/11/2020 23:25	2/12/2020 11:45	12.4	0.64	1.21	
2/13/2020 9:15	2/13/2020 9:55	0.7	0.03	0.05	0.12	33.7	2/13/2020 9:10	2/13/2020 16:15	7.2	0.48	0.55	
2/13/2020 16:15	2/13/2020 19:20	3.1	0.23	0.07	0.72	40.7	2/13/2020 16:15	2/14/2020 7:15	15.1	0.82	1.57	
2/14/2020 20:35	2/15/2020 2:35	6.0	0.13	0.02	0.12	25.7	2/14/2020 20:35	2/15/2020 14:35	18.1	0.66	1.21	
2/15/2020 14:35	2/16/2020 0:25	9.8	0.40	0.04	0.36	15.0	2/15/2020 14:35	2/16/2020 12:25	21.9	1.09	3.01	
2/23/2020 4:40	2/23/2020 7:35	2.9	0.17	0.06	0.36	173.0	2/23/2020 4:40	2/23/2020 19:30	14.9	0.65	1.81	
2/25/2020 19:25	2/25/2020 20:20	0.9	0.03	0.03	0.12	60.1	2/25/2020 19:25	2/26/2020 3:55	8.6	0.40	0.50	
2/26/2020 3:55	2/26/2020 6:15	2.3	0.03	0.01	0.12	68.6	2/26/2020 3:55	2/26/2020 18:10	14.3	0.41	0.50	
2/28/2020 16:55	2/28/2020 23:45	6.8	0.10	0.01	0.12	129.6	2/28/2020 16:55	2/29/2020 11:45	18.9	0.48	1.45	
3/1/2020 0:25	3/1/2020 5:05	4.7	0.06	0.01	0.12	30.5	3/1/2020 0:20	3/1/2020 17:00	16.8	0.45	0.67	
3/1/2020 18:15	3/1/2020 21:15	3.0	0.03	0.01	0.12	13.5	3/1/2020 18:15	3/2/2020 4:50	10.7	0.43	0.50	
3/2/2020 4:55	3/2/2020 15:50	10.9	0.26	0.02	0.12	24.2	3/2/2020 4:50	3/3/2020 1:25	20.7	0.79	1.81	
3/3/2020 1:25	3/3/2020 8:40	7.3	0.09	0.01	0.12	10.2	3/3/2020 1:25	3/3/2020 20:35	19.3	0.60	1.14	
3/5/2020 19:55	3/6/2020 12:55	17.0	0.77	0.05	0.12	62.8	3/5/2020 19:50	3/7/2020 0:55	29.2	1.45	2.84	
3/7/2020 12:20	3/7/2020 14:20	2.0	0.05	0.03	0.12	25.4	3/7/2020 12:20	3/7/2020 21:55	9.7	0.64	1.06	
3/7/2020 22:00	3/7/2020 23:55	1.9	0.18	0.09	0.36	9.6	3/7/2020 21:55	3/8/2020 6:00	8.2	1.15	3.19	
3/8/2020 6:05	3/8/2020 6:40	0.6	0.03	0.05	0.12	6.8	3/8/2020 6:00	3/8/2020 18:40	12.8	0.63	0.99	
3/11/2020 4:25	3/11/2020 5:15	0.8	0.06	0.07	0.12	77.1	3/11/2020 4:25	3/11/2020 17:10	12.8	0.57	1.37	
3/13/2020 5:45	3/13/2020 19:40	13.9	0.31	0.02	0.12	48.8	3/13/2020 5:45	3/14/2020 7:40	26.0	0.79	1.45	
3/24/2020 14:45	3/24/2020 20:55	6.2	0.08	0.01	0.48	261.5	3/24/2020 14:45	3/24/2020 21:30	6.8	0.52	1.06	
3/24/2020 21:30	3/25/2020 13:30	16.0	0.14	0.01	0.12	6.7	3/24/2020 21:30	3/26/2020 1:25	28.0	0.51	0.99	
3/27/2020 6:05	3/27/2020 12:35	6.5	0.04	0.01	0.12	43.0	3/27/2020 6:00	3/28/2020 0:30	18.6	0.44	0.50	

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)
3/28/2020 1:40	3/28/2020 6:05	4.4	0.06	0.01	0.12	62.6	3/28/2020 1:40	3/28/2020 15:55	14.3	0.49	0.85	
3/28/2020 16:00	3/29/2020 8:50	16.8	0.66	0.04	0.24	12.6	3/28/2020 15:55	3/29/2020 20:45	28.9	1.46	4.80	
3/30/2020 1:10	3/30/2020 5:05	3.9	0.36	0.09	0.60	20.5	3/30/2020 1:05	3/30/2020 12:00	11.0	1.81	5.03	
3/30/2020 12:05	3/31/2020 1:20	13.3	0.30	0.02	0.24	7.2	3/30/2020 12:00	3/31/2020 13:15	25.3	1.18	2.84	
3/31/2020 17:35	3/31/2020 20:20	2.8	0.06	0.02	0.24	19.2	3/31/2020 17:35	4/1/2020 3:30	10.0	0.82	1.06	
4/1/2020 3:35	4/1/2020 12:30	8.9	0.09	0.01	0.12	9.9	4/1/2020 3:30	4/2/2020 0:30	21.1	0.74	1.21	
4/3/2020 15:10	4/3/2020 19:25	4.3	0.04	0.01	0.24	53.2	4/3/2020 15:10	4/4/2020 7:25	16.3	0.62	0.67	
4/11/2020 11:25	4/11/2020 12:05	0.7	0.04	0.06	0.12	188.2	4/11/2020 11:25	4/12/2020 0:05	12.8	0.50	0.55	
4/18/2020 6:55	4/18/2020 10:25	3.5	0.05	0.01	0.12	163.5	4/18/2020 6:55	4/18/2020 22:25	15.6	0.51	0.67	
4/22/2020 5:30	4/22/2020 21:25	15.9	0.60	0.04	0.24	92.1	4/22/2020 5:25	4/22/2020 22:05	16.8	1.54	3.19	
4/22/2020 22:10	4/23/2020 3:35	5.4	0.38	0.07	0.24	6.7	4/22/2020 22:05	4/23/2020 15:30	17.5	1.56	3.37	
4/23/2020 15:55	4/23/2020 23:20	7.4	0.16	0.02	0.36	12.9	4/23/2020 15:55	4/24/2020 11:15	19.4	0.82	1.37	
4/25/2020 6:15	4/25/2020 11:05	4.8	0.44	0.09	0.48	33.2	4/25/2020 6:15	4/25/2020 23:00	16.8	1.54	6.55	
4/26/2020 21:45	4/27/2020 3:20	5.6	0.12	0.02	0.12	35.8	4/26/2020 21:40	4/27/2020 15:20	17.8	0.73	1.57	
4/29/2020 19:00	4/29/2020 19:40	0.7	0.04	0.06	0.24	65.5	4/29/2020 18:55	4/30/2020 7:40	12.8	0.56	0.79	
5/2/2020 2:55	5/2/2020 15:25	12.5	0.49	0.04	0.24	55.9	5/2/2020 2:55	5/3/2020 3:20	24.5	1.07	3.95	
5/5/2020 19:45	5/6/2020 13:10	17.4	0.28	0.02	0.60	76.9	5/5/2020 19:45	5/7/2020 1:05	29.4	0.60	1.29	
5/11/2020 18:40	5/11/2020 23:45	5.1	0.05	0.01	0.12	125.7	5/11/2020 18:40	5/12/2020 11:45	17.2	0.44	0.50	
5/13/2020 2:10	5/13/2020 6:15	4.1	0.04	0.01	0.12	29.8	5/13/2020 2:10	5/13/2020 18:10	16.1	0.45	0.55	
5/14/2020 4:35	5/14/2020 8:05	3.5	0.10	0.03	0.24	26.4	5/14/2020 4:30	5/14/2020 20:00	15.6	0.56	1.14	
5/16/2020 10:25	5/17/2020 7:05	20.7	0.65	0.03	0.36	51.2	5/16/2020 10:25	5/17/2020 19:05	32.8	1.05	5.03	
5/20/2020 16:00	5/20/2020 18:25	2.4	0.05	0.02	0.12	86.6	5/20/2020 15:55	5/21/2020 1:50	10.0	0.49	0.55	
5/21/2020 1:50	5/21/2020 21:20	19.5	0.71	0.04	0.24	9.3	5/21/2020 1:50	5/22/2020 9:20	31.6	1.18	4.36	
5/22/2020 14:50	5/23/2020 4:10	13.3	0.57	0.04	0.60	22.0	5/22/2020 14:45	5/23/2020 16:10	25.5	0.95	3.01	
5/25/2020 4:00	5/25/2020 13:10	9.2	0.22	0.02	0.12	48.6	5/25/2020 3:55	5/26/2020 1:10	21.3	0.64	1.29	
5/30/2020 7:05	5/31/2020 10:45	27.7	1.45	0.05	0.48	115.8	5/30/2020 7:05	5/31/2020 22:40	39.7	1.83	6.82	
6/5/2020 20:15	6/5/2020 20:30	0.3	0.16	0.64	0.96	133.0	6/5/2020 20:15	6/6/2020 8:25	12.3	0.79	3.37	
6/7/2020 0:10	6/7/2020 10:15	10.1	0.64	0.06	0.36	27.8	6/7/2020 0:10	6/7/2020 20:45	20.7	1.53	5.27	
6/7/2020 20:50	6/7/2020 20:55	0.1	0.03	0.36	0.24	10.8	6/7/2020 20:45	6/8/2020 8:55	12.3	0.48	0.67	
6/9/2020 0:10	6/9/2020 12:00	11.8	0.26	0.02	0.12	38.2	6/9/2020 0:10	6/9/2020 18:40	18.6	0.73	1.45	
6/9/2020 18:45	6/9/2020 20:10	1.4	0.06	0.04	0.12	8.8	6/9/2020 18:40	6/10/2020 8:10	13.6	0.57	1.14	
6/11/2020 9:05	6/11/2020 11:55	2.8	0.22	0.08	0.24	38.1	6/11/2020 9:00	6/11/2020 23:55	15.0	0.79	2.37	
6/12/2020 12:05	6/12/2020 15:05	3.0	0.28	0.09	0.24	25.1	6/12/2020 12:00	6/12/2020 21:10	9.3	1.23	3.19	
6/12/2020 21:15	6/13/2020 1:25	4.2	0.11	0.03	0.24	6.8	6/12/2020 21:10	6/13/2020 13:25	16.3	0.78	2.37	
6/13/2020 21:45	6/14/2020 0:25	2.7	0.04	0.02	0.12	23.9	6/13/2020 21:40	6/14/2020 12:25	14.8	0.38	0.43	
6/15/2020 4:00	6/15/2020 14:20	10.3	0.14	0.01	0.12	30.2	6/15/2020 3:55	6/16/2020 2:15	22.4	0.44	0.79	
6/16/2020 3:40	6/16/2020 13:15	9.6	0.08	0.01	0.12	18.1	6/16/2020 3:40	6/17/2020 1:15	21.7	0.39	0.92	
6/27/2020 10:35	6/28/2020 5:40	19.1	0.68	0.04	0.36	264.8	6/27/2020 10:30	6/28/2020 17:40	31.3	0.79	3.19	
6/30/2020 5:40	6/30/2020 9:30	3.8	0.03	0.01	0.12	51.2	6/30/2020 5:35	6/30/2020 21:30	16.0	0.29	0.31	

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)
10/3/2019 1:35	10/3/2019 4:45	3.2	0.03	0.01	0.12	96.3	10/3/2019 1:30	10/3/2019 14:30	13.1	0.18	0.24	8,433
10/3/2019 14:30	10/3/2019 17:30	3.0	0.05	0.02	0.12	109.2	10/3/2019 14:30	10/4/2019 2:10	11.8	0.20	0.40	
10/4/2019 2:15	10/4/2019 4:05	1.8	0.05	0.03	0.12	9.0	10/4/2019 2:10	10/4/2019 16:05	14.0	0.20	0.32	
10/7/2019 19:10	10/8/2019 16:00	20.8	0.39	0.02	0.24	88.8	10/7/2019 19:10	10/9/2019 4:00	32.9	0.34	0.99	
10/16/2019 5:05	10/16/2019 9:40	4.6	0.17	0.04	0.24	186.4	10/16/2019 5:00	10/16/2019 15:40	10.8	0.37	0.99	
10/16/2019 15:40	10/16/2019 20:15	4.6	0.30	0.07	0.48	6.8	10/16/2019 15:40	10/17/2019 4:15	12.7	0.58	2.41	
10/17/2019 4:15	10/17/2019 17:00	12.8	0.13	0.01	0.24	8.5	10/17/2019 4:15	10/18/2019 5:00	24.8	0.26	0.67	
10/18/2019 6:00	10/18/2019 6:15	0.3	0.03	0.12	0.12	16.2	10/18/2019 6:00	10/18/2019 14:40	8.8	0.22	0.28	
10/18/2019 14:40	10/19/2019 14:20	23.7	1.03	0.04	0.48	24.8	10/18/2019 14:40	10/20/2019 2:15	35.7	0.92	2.60	
10/20/2019 7:15	10/21/2019 3:50	20.6	0.56	0.03	0.84	20.2	10/20/2019 7:15	10/21/2019 7:40	24.5	0.76	2.60	
10/21/2019 7:45	10/22/2019 7:50	24.1	1.00	0.04	0.24	9.7	10/21/2019 7:40	10/22/2019 19:50	36.3	0.95	2.23	
10/25/2019 9:40	10/25/2019 19:15	9.6	0.28	0.03	0.36	76.6	10/25/2019 9:40	10/26/2019 7:15	21.7	0.42	1.21	
11/9/2019 0:40	11/9/2019 15:35	14.9	0.24	0.02	0.12	341.6	11/9/2019 0:40	11/10/2019 3:30	26.9	0.25	0.80	
11/12/2019 3:55	11/12/2019 7:50	3.9	0.29	0.07	0.24	60.8	11/12/2019 3:55	11/12/2019 19:50	16.0	0.45	1.46	
11/15/2019 3:35	11/15/2019 6:10	2.6	0.20	0.08	0.24	68.5	11/15/2019 3:30	11/15/2019 18:10	14.8	0.36	1.60	
11/16/2019 14:35	11/16/2019 18:15	3.7	0.08	0.02	0.12	33.6	11/16/2019 14:35	11/16/2019 23:25	8.9	0.24	0.45	
11/16/2019 23:30	11/17/2019 20:50	21.3	0.38	0.02	0.24	6.7	11/16/2019 23:25	11/18/2019 8:45	33.4	0.35	1.10	
11/18/2019 11:40	11/19/2019 10:00	22.3	0.88	0.04	0.60	16.8	11/18/2019 11:35	11/19/2019 21:55	34.4	0.78	3.45	
11/24/2019 0:15	11/24/2019 2:30	2.3	0.11	0.05	0.12	113.2	11/24/2019 0:10	11/24/2019 14:25	14.3	0.26	0.56	
11/25/2019 0:25	11/25/2019 9:10	8.8	0.06	0.01	0.12	22.9	11/25/2019 0:20	11/25/2019 15:20	15.1	0.18	0.21	
11/25/2019 15:25	11/25/2019 21:10	5.8	0.03	0.01	0.12	10.2	11/25/2019 15:20	11/26/2019 9:10	17.9	0.17	0.18	
12/1/2019 11:25	12/1/2019 13:20	1.9	0.03	0.02	0.12	150.2	12/1/2019 11:25	12/2/2019 1:15	13.9	0.18	0.21	
12/4/2019 6:05	12/4/2019 7:45	1.7	0.03	0.02	0.12	216.8	12/4/2019 6:00	12/4/2019 19:40	13.8	0.12	0.15	
12/7/2019 0:00	12/7/2019 13:35	13.6	0.39	0.03	0.24	282.8	12/6/2019 23:55	12/8/2019 1:30	25.7	0.35	0.80	
12/10/2019 11:30	12/10/2019 23:00	11.5	0.20	0.02	0.12	74.3	12/10/2019 11:25	12/11/2019 9:40	22.3	0.23	0.40	
12/11/2019 9:45	12/12/2019 14:35	28.8	0.54	0.02	0.24	15.2	12/11/2019 9:40	12/13/2019 2:35	41.0	0.41	0.67	
12/13/2019 17:45	12/13/2019 22:35	4.8	0.06	0.01	0.24	27.4	12/13/2019 17:45	12/14/2019 4:15	10.6	0.29	0.36	
12/14/2019 4:20	12/14/2019 13:35	9.3	0.17	0.02	0.24	10.5	12/14/2019 4:15	12/14/2019 23:35	19.4	0.38	0.67	
12/14/2019 23:40	12/15/2019 12:50	13.2	0.17	0.01	0.24	11.7	12/14/2019 23:35	12/16/2019 0:45	25.3	0.42	0.89	
12/18/2019 18:10	12/19/2019 2:40	8.5	0.36	0.04	0.12	83.8	12/18/2019 18:10	12/19/2019 11:55	17.8	0.59	0.89	
12/19/2019 11:55	12/21/2019 15:10	51.3	5.04	0.10	1.44	10.8	12/19/2019 11:55	12/22/2019 3:10	63.3	4.75	11.15	
12/22/2019 16:55	12/23/2019 8:15	15.3	0.40	0.03	0.12	28.3	12/22/2019 16:55	12/23/2019 20:10	27.3	1.12	2.23	
12/26/2019 21:40	12/27/2019 0:35	2.9	0.03	0.01	0.12	89.7	12/26/2019 21:40	12/27/2019 12:30	14.9	0.36	0.40	
12/30/2019 4:40	12/30/2019 7:40	3.0	0.06	0.02	0.12	168.7	12/30/2019 4:40	12/30/2019 19:40	15.1	0.33	0.50	
12/31/2019 11:40	12/31/2019 15:25	3.8	0.09	0.02	0.24	29.9	12/31/2019 11:35	1/1/2020 2:25	13.9	0.42	0.99	
1/1/2020 2:25	1/1/2020 8:15	5.8	0.18	0.03	0.60	11.2	1/1/2020 2:25	1/1/2020 19:55	17.6	0.44	1.10	
1/1/2020 19:55	1/2/2020 3:50	7.9	0.65	0.08	0.36	12.2	1/1/2020 19:55	1/2/2020 11:00	15.2	1.30	2.80	
1/2/2020 11:00	1/2/2020 20:05	9.1	0.12	0.01	0.12	8.4	1/2/2020 11:00	1/3/2020 8:05	21.2	0.74	1.10	
1/3/2020 19:55	1/4/2020 1:45	5.8	0.34	0.06	0.24	28.4	1/3/2020 19:50	1/4/2020 13:45	18.0	0.84	2.23	
1/4/2020 15:25	1/4/2020 16:25	1.0	0.04	0.04	0.24	15.3	1/4/2020 15:20	1/5/2020 3:25	12.2	0.50	0.67	
1/5/2020 3:25	1/5/2020 11:35	8.2	0.20	0.02	0.24	12.0	1/5/2020 3:25	1/5/2020 23:35	20.3	0.58	1.10	
1/6/2020 2:25	1/6/2020 7:05	4.7	0.03	0.01	0.12	15.3	1/6/2020 2:25	1/6/2020 14:10	11.8	0.50	0.50	
1/6/2020 14:10	1/7/2020 9:00	18.8	0.42	0.02	0.12	27.1	1/6/2020 14:10	1/7/2020 15:45	25.7	0.87	1.60	

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)
1/7/2020 15:50	1/7/2020 20:45	4.9	0.13	0.03	0.36	10.3	1/7/2020 15:45	1/8/2020 8:45	17.1	0.78	1.46	
1/9/2020 6:15	1/9/2020 10:45	4.5	0.09	0.02	0.12	34.4	1/9/2020 6:10	1/9/2020 22:40	16.6	0.49	0.67	
1/10/2020 2:40	1/10/2020 23:30	20.8	0.46	0.02	0.12	18.4	1/10/2020 2:35	1/11/2020 3:45	25.3	0.79	1.21	
1/11/2020 3:50	1/11/2020 13:25	9.6	0.68	0.07	0.96	7.6	1/11/2020 3:45	1/11/2020 19:25	15.8	1.65	7.49	
1/11/2020 19:30	1/12/2020 4:15	8.8	0.12	0.01	0.12	7.2	1/11/2020 19:25	1/12/2020 6:20	11.0	0.94	1.21	
1/12/2020 6:20	1/12/2020 14:45	8.4	0.12	0.01	0.12	7.3	1/12/2020 6:20	1/13/2020 2:45	20.5	0.66	0.89	
1/15/2020 12:10	1/16/2020 12:10	24.0	0.50	0.02	0.24	69.9	1/15/2020 12:10	1/17/2020 0:10	36.1	0.44	0.67	
1/18/2020 0:45	1/18/2020 8:45	8.0	0.49	0.06	0.24	37.1	1/18/2020 0:40	1/18/2020 20:45	20.2	0.99	2.06	
1/19/2020 11:20	1/19/2020 12:25	1.1	0.03	0.03	0.12	28.3	1/19/2020 11:15	1/20/2020 0:25	13.3	0.41	0.50	
1/21/2020 3:20	1/21/2020 22:25	19.1	0.77	0.04	0.36	68.3	1/21/2020 3:20	1/22/2020 8:20	29.1	0.91	2.23	
1/22/2020 8:20	1/23/2020 0:55	16.6	0.30	0.02	0.12	10.4	1/22/2020 8:20	1/23/2020 5:45	21.5	0.88	1.21	
1/23/2020 5:45	1/25/2020 10:50	53.1	1.41	0.03	1.20	15.7	1/23/2020 5:45	1/25/2020 13:50	56.2	1.29	3.22	
1/25/2020 13:50	1/25/2020 15:10	1.3	0.03	0.02	0.12	8.2	1/25/2020 13:50	1/26/2020 1:15	11.5	0.65	0.89	
1/26/2020 1:20	1/26/2020 11:15	9.9	0.32	0.03	0.24	14.5	1/26/2020 1:15	1/26/2020 20:15	19.1	0.90	1.60	
1/26/2020 20:20	1/27/2020 1:30	5.2	0.05	0.01	0.12	9.3	1/26/2020 20:15	1/27/2020 13:25	17.3	0.53	0.80	
1/27/2020 17:05	1/28/2020 9:30	16.4	1.08	0.07	0.36	20.8	1/27/2020 17:05	1/28/2020 19:15	26.3	1.67	7.05	
1/28/2020 19:20	1/28/2020 20:50	1.5	0.04	0.03	0.12	11.5	1/28/2020 19:15	1/29/2020 7:05	11.9	0.86	1.10	
1/29/2020 7:05	1/29/2020 12:10	5.1	0.11	0.02	0.12	11.8	1/29/2020 7:05	1/30/2020 0:10	17.2	0.61	0.99	
1/30/2020 18:00	1/30/2020 23:00	5.0	0.15	0.03	0.12	30.8	1/30/2020 17:55	1/31/2020 4:25	10.6	0.63	0.80	
1/31/2020 4:30	2/1/2020 7:50	27.3	1.10	0.04	0.36	7.0	1/31/2020 4:25	2/1/2020 14:55	34.6	1.24	5.05	
2/1/2020 15:00	2/2/2020 2:05	11.1	0.15	0.01	0.12	7.8	2/1/2020 14:55	2/2/2020 14:00	23.2	0.90	1.33	
2/3/2020 0:40	2/3/2020 4:10	3.5	0.09	0.03	0.12	23.3	2/3/2020 0:40	2/3/2020 16:10	15.6	0.47	0.67	
2/4/2020 11:50	2/7/2020 9:35	69.8	4.61	0.07	0.24	33.8	2/4/2020 11:50	2/7/2020 15:10	75.4	3.57	9.12	
2/7/2020 15:15	2/8/2020 13:55	22.7	0.63	0.03	0.84	8.9	2/7/2020 15:10	2/9/2020 1:50	34.8	1.38	2.60	
2/11/2020 23:25	2/11/2020 23:45	0.3	0.10	0.30	0.60	84.0	2/11/2020 23:25	2/12/2020 11:45	12.4	0.45	0.89	
2/13/2020 9:15	2/13/2020 9:55	0.7	0.03	0.05	0.12	33.7	2/13/2020 9:10	2/13/2020 16:15	7.2	0.33	0.40	
2/13/2020 16:15	2/13/2020 19:20	3.1	0.23	0.07	0.72	40.7	2/13/2020 16:15	2/14/2020 7:15	15.1	0.60	1.21	
2/14/2020 20:35	2/15/2020 2:35	6.0	0.13	0.02	0.12	25.7	2/14/2020 20:35	2/15/2020 14:35	18.1	0.43	0.89	
2/15/2020 14:35	2/16/2020 0:25	9.8	0.40	0.04	0.36	15.0	2/15/2020 14:35	2/16/2020 12:25	21.9	0.76	2.06	
2/23/2020 4:40	2/23/2020 7:35	2.9	0.17	0.06	0.36	173.0	2/23/2020 4:40	2/23/2020 19:30	14.9	0.43	1.46	
2/25/2020 19:25	2/25/2020 20:20	0.9	0.03	0.03	0.12	60.1	2/25/2020 19:25	2/26/2020 3:55	8.6	0.26	0.32	
2/26/2020 3:55	2/26/2020 6:15	2.3	0.03	0.01	0.12	68.6	2/26/2020 3:55	2/26/2020 18:10	14.3	0.24	0.32	
2/28/2020 16:55	2/28/2020 23:45	6.8	0.10	0.01	0.12	129.6	2/28/2020 16:55	2/29/2020 11:45	18.9	0.28	0.99	
3/1/2020 0:25	3/1/2020 5:05	4.7	0.06	0.01	0.12	30.5	3/1/2020 0:20	3/1/2020 17:00	16.8	0.22	0.36	
3/1/2020 18:15	3/1/2020 21:15	3.0	0.03	0.01	0.12	13.5	3/1/2020 18:15	3/2/2020 4:50	10.7	0.21	0.24	
3/2/2020 4:55	3/2/2020 15:50	10.9	0.26	0.02	0.12	24.2	3/2/2020 4:50	3/3/2020 1:25	20.7	0.42	1.10	
3/3/2020 1:25	3/3/2020 8:40	7.3	0.09	0.01	0.12	10.2	3/3/2020 1:25	3/3/2020 20:35	19.3	0.30	0.67	
3/5/2020 19:55	3/6/2020 12:55	17.0	0.77	0.05	0.12	62.8	3/5/2020 19:50	3/7/2020 0:55	29.2	0.90	1.74	
3/7/2020 12:20	3/7/2020 14:20	2.0	0.05	0.03	0.12	25.4	3/7/2020 12:20	3/7/2020 21:55	9.7	0.34	0.61	
3/7/2020 22:00	3/7/2020 23:55	1.9	0.18	0.09	0.36	9.6	3/7/2020 21:55	3/8/2020 6:00	8.2	0.67	1.90	
3/8/2020 6:05	3/8/2020 6:40	0.6	0.03	0.05	0.12	6.8	3/8/2020 6:00	3/8/2020 18:40	12.8	0.32	0.56	
3/11/2020 4:25	3/11/2020 5:15	0.8	0.06	0.07	0.12	77.1	3/11/2020 4:25	3/11/2020 17:10	12.8	0.28	0.80	
3/13/2020 5:45	3/13/2020 19:40	13.9	0.31	0.02	0.12	48.8	3/13/2020 5:45	3/14/2020 7:40	26.0	0.42	0.89	
3/24/2020 14:45	3/24/2020 20:55	6.2	0.08	0.01	0.48	261.5	3/24/2020 14:45	3/24/2020 21:30	6.8	0.25	0.67	

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)
3/24/2020 21:30	3/25/2020 13:30	16.0	0.14	0.01	0.12	6.7	3/24/2020 21:30	3/26/2020 1:25	28.0	0.24	0.56	
3/27/2020 6:05	3/27/2020 12:35	6.5	0.04	0.01	0.12	43.0	3/27/2020 6:00	3/28/2020 0:30	18.6	0.19	0.24	
3/28/2020 1:40	3/28/2020 6:05	4.4	0.06	0.01	0.12	62.6	3/28/2020 1:40	3/28/2020 15:55	14.3	0.22	0.45	
3/28/2020 16:00	3/29/2020 8:50	16.8	0.66	0.04	0.24	12.6	3/28/2020 15:55	3/29/2020 20:45	28.9	0.73	2.41	
3/30/2020 1:10	3/30/2020 5:05	3.9	0.36	0.09	0.60	20.5	3/30/2020 1:05	3/30/2020 12:00	11.0	0.89	3.01	
3/30/2020 12:05	3/31/2020 1:20	13.3	0.30	0.02	0.24	7.2	3/30/2020 12:00	3/31/2020 13:15	25.3	0.55	1.33	
3/31/2020 17:35	3/31/2020 20:20	2.8	0.06	0.02	0.24	19.2	3/31/2020 17:35	4/1/2020 3:30	10.0	0.37	0.56	
4/1/2020 3:35	4/1/2020 12:30	8.9	0.09	0.01	0.12	9.9	4/1/2020 3:30	4/2/2020 0:30	21.1	0.31	0.67	
4/3/2020 15:10	4/3/2020 19:25	4.3	0.04	0.01	0.24	53.2	4/3/2020 15:10	4/4/2020 7:25	16.3	0.24	0.28	
4/11/2020 11:25	4/11/2020 12:05	0.7	0.04	0.06	0.12	188.2	4/11/2020 11:25	4/12/2020 0:05	12.8	0.18	0.21	
4/18/2020 6:55	4/18/2020 10:25	3.5	0.05	0.01	0.12	163.5	4/18/2020 6:55	4/18/2020 22:25	15.6	0.25	0.45	
4/22/2020 5:30	4/22/2020 21:25	15.9	0.60	0.04	0.24	92.1	4/22/2020 5:25	4/22/2020 22:05	16.8	0.95	2.06	
4/22/2020 22:10	4/23/2020 3:35	5.4	0.38	0.07	0.24	6.7	4/22/2020 22:05	4/23/2020 15:30	17.5	0.98	2.37	
4/23/2020 15:55	4/23/2020 23:20	7.4	0.16	0.02	0.36	12.9	4/23/2020 15:55	4/24/2020 11:15	19.4	0.37	1.02	
4/25/2020 6:15	4/25/2020 11:05	4.8	0.44	0.09	0.48	33.2	4/25/2020 6:15	4/25/2020 23:00	16.8	0.97	4.33	
4/26/2020 21:45	4/27/2020 3:20	5.6	0.12	0.02	0.12	35.8	4/26/2020 21:40	4/27/2020 15:20	17.8	0.37	1.46	
4/29/2020 19:00	4/29/2020 19:40	0.7	0.04	0.06	0.24	65.5	4/29/2020 18:55	4/30/2020 7:40	12.8	0.21	0.48	
5/2/2020 2:55	5/2/2020 15:25	12.5	0.49	0.04	0.24	55.9	5/2/2020 2:55	5/3/2020 3:20	24.5	0.72	2.94	
5/5/2020 19:45	5/6/2020 13:10	17.4	0.28	0.02	0.60	76.9	5/5/2020 19:45	5/7/2020 1:05	29.4	0.26	1.02	
5/11/2020 18:40	5/11/2020 23:45	5.1	0.05	0.01	0.12	125.7	5/11/2020 18:40	5/12/2020 11:45	17.2	0.13	0.15	
5/13/2020 2:10	5/13/2020 6:15	4.1	0.04	0.01	0.12	29.8	5/13/2020 2:10	5/13/2020 18:10	16.1	0.13	0.23	
5/14/2020 4:35	5/14/2020 8:05	3.5	0.10	0.03	0.24	26.4	5/14/2020 4:30	5/14/2020 20:00	15.6	0.24	0.89	
5/16/2020 10:25	5/17/2020 7:05	20.7	0.65	0.03	0.36	51.2	5/16/2020 10:25	5/17/2020 19:05	32.8	0.73	3.82	
5/20/2020 16:00	5/20/2020 18:25	2.4	0.05	0.02	0.12	86.6	5/20/2020 15:55	5/21/2020 1:50	10.0	0.17	0.23	
5/21/2020 1:50	5/21/2020 21:20	19.5	0.71	0.04	0.24	9.3	5/21/2020 1:50	5/22/2020 9:20	31.6	0.90	3.14	
5/22/2020 14:50	5/23/2020 4:10	13.3	0.57	0.04	0.60	22.0	5/22/2020 14:45	5/23/2020 16:10	25.5	0.79	2.37	
5/25/2020 4:00	5/25/2020 13:10	9.2	0.22	0.02	0.12	48.6	5/25/2020 3:55	5/26/2020 1:10	21.3	0.47	1.34	
5/30/2020 7:05	5/31/2020 10:45	27.7	1.45	0.05	0.48	115.8	5/30/2020 7:05	5/31/2020 22:40	39.7	1.67	4.88	
6/5/2020 20:15	6/5/2020 20:30	0.3	0.16	0.64	0.96	133.0	6/5/2020 20:15	6/6/2020 8:25	12.3	0.51	2.74	
6/7/2020 0:10	6/7/2020 10:15	10.1	0.64	0.06	0.36	27.8	6/7/2020 0:10	6/7/2020 20:45	20.7	1.27	3.82	
6/7/2020 20:50	6/7/2020 20:55	0.1	0.03	0.36	0.24	10.8	6/7/2020 20:45	6/8/2020 8:55	12.3	0.25	0.34	
6/9/2020 0:10	6/9/2020 12:00	11.8	0.26	0.02	0.12	38.2	6/9/2020 0:10	6/9/2020 18:40	18.6	0.50	1.46	
6/9/2020 18:45	6/9/2020 20:10	1.4	0.06	0.04	0.12	8.8	6/9/2020 18:40	6/10/2020 8:10	13.6	0.35	1.02	
6/11/2020 9:05	6/11/2020 11:55	2.8	0.22	0.08	0.24	38.1	6/11/2020 9:00	6/11/2020 23:55	15.0	0.57	2.20	
6/12/2020 12:05	6/12/2020 15:05	3.0	0.28	0.09	0.24	25.1	6/12/2020 12:00	6/12/2020 21:10	9.3	0.98	2.55	
6/12/2020 21:15	6/13/2020 1:25	4.2	0.11	0.03	0.24	6.8	6/12/2020 21:10	6/13/2020 13:25	16.3	0.64	2.37	
6/13/2020 21:45	6/14/2020 0:25	2.7	0.04	0.02	0.12	23.9	6/13/2020 21:40	6/14/2020 12:25	14.8	0.26	0.34	
6/15/2020 4:00	6/15/2020 14:20	10.3	0.14	0.01	0.12	30.2	6/15/2020 3:55	6/16/2020 2:15	22.4	0.33	0.76	
6/16/2020 3:40	6/16/2020 13:15	9.6	0.08	0.01	0.12	18.1	6/16/2020 3:40	6/17/2020 1:15	21.7	0.28	0.89	
6/27/2020 10:35	6/28/2020 5:40	19.1	0.68	0.04	0.36	264.8	6/27/2020 10:30	6/28/2020 17:40	31.3	0.83	3.36	
6/30/2020 5:40	6/30/2020 9:30	3.8	0.03	0.01	0.12	51.2	6/30/2020 5:35	6/30/2020 21:30	16.0	0.20	0.28	

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 ($feet^3$)
10/3/2019 1:50	10/3/2019 4:05	2.3	0.04	0.02	0.12	96.8	10/3/2019 1:50	10/3/2019 16:05	14.3	0.07	0.07	3,612
10/3/2019 22:15	10/4/2019 4:40	6.4	0.06	0.01	0.12	20.4	10/3/2019 22:15	10/4/2019 16:40	18.5	0.07	0.07	4,617
10/7/2019 18:45	10/8/2019 16:20	21.6	0.82	0.04	0.72	87.8	10/7/2019 18:40	10/9/2019 4:15	33.7	0.39	0.57	47,616
10/16/2019 5:20	10/16/2019 9:50	4.5	0.13	0.03	0.24	181.2	10/16/2019 5:20	10/16/2019 15:45	10.5	0.22	0.26	8,367
10/16/2019 15:45	10/16/2019 20:25	4.7	0.25	0.05	0.24	6.8	10/16/2019 15:45	10/17/2019 3:30	11.8	0.32	0.35	13,842
10/17/2019 3:35	10/17/2019 17:40	14.1	0.13	0.01	0.36	7.4	10/17/2019 3:30	10/18/2019 5:35	26.2	0.30	0.33	27,888
10/18/2019 15:10	10/19/2019 15:00	23.8	0.98	0.04	0.36	25.2	10/18/2019 15:10	10/20/2019 3:00	35.9	0.67	0.88	87,132
10/20/2019 7:20	10/20/2019 22:50	15.5	0.49	0.03	0.72	19.7	10/20/2019 7:20	10/21/2019 7:05	23.8	0.97	1.46	83,229
10/21/2019 7:05	10/22/2019 6:45	23.7	1.02	0.04	0.6	8.3	10/21/2019 7:05	10/22/2019 18:40	35.7	2.67	3.81	342,690
10/25/2019 9:30	10/25/2019 12:05	2.6	0.13	0.05	0.12	77.4	10/25/2019 9:30	10/25/2019 18:40	9.3	1.15	1.25	38,418
10/25/2019 18:40	10/25/2019 21:10	2.5	0.21	0.08	0.6	7.2	10/25/2019 18:40	10/26/2019 9:10	14.6	1.19	1.32	62,517
11/9/2019 0:45	11/9/2019 16:20	15.6	0.27	0.02	0.24	339.9	11/9/2019 0:40	11/10/2019 4:15	27.7	0.29	0.35	29,166
11/12/2019 4:00	11/12/2019 8:15	4.3	0.31	0.07	0.12	60.6	11/12/2019 3:55	11/12/2019 20:10	16.3	0.39	0.50	22,722
11/15/2019 3:35	11/15/2019 10:35	7.0	0.23	0.03	0.24	68.3	11/15/2019 3:30	11/15/2019 17:05	13.7	0.41	0.47	20,070
11/15/2019 17:05	11/15/2019 20:20	3.3	1.5	0.46	2.4	11.9	11/15/2019 17:05	11/16/2019 8:15	15.3	2.67	4.78	146,577
11/16/2019 14:25	11/17/2019 20:30	30.1	0.47	0.02	0.36	18.2	11/16/2019 14:25	11/18/2019 8:30	42.2	3.45	3.64	523,522
11/18/2019 11:50	11/19/2019 10:05	22.3	0.53	0.02	0.48	16.8	11/18/2019 11:50	11/19/2019 22:05	34.3	3.70	4.18	457,054
11/23/2019 23:40	11/24/2019 1:45	2.1	0.12	0.06	0.24	112.3	11/23/2019 23:35	11/24/2019 13:40	14.2	1.08	1.11	54,846
11/24/2019 21:40	11/25/2019 22:40	25.0	0.81	0.03	0.48	20.3	11/24/2019 21:40	11/26/2019 10:40	37.1	2.07	2.76	275,956
12/1/2019 11:30	12/1/2019 15:40	4.2	0.06	0.01	0.12	134.7	12/1/2019 11:30	12/2/2019 3:40	16.3	0.68	0.69	39,549
12/4/2019 6:15	12/4/2019 7:55	1.7	0.04	0.02	0.12	66.6	12/4/2019 6:10	12/4/2019 19:50	13.8	0.55	0.57	27,072
12/6/2019 20:35	12/7/2019 17:25	20.8	0.41	0.02	0.12	62.3	12/6/2019 20:35	12/8/2019 5:25	32.9	0.59	0.65	70,122
12/10/2019 11:40	12/10/2019 23:50	12.2	0.26	0.02	0.12	74.8	12/10/2019 11:35	12/11/2019 9:55	22.4	0.62	0.69	50,250
12/11/2019 10:00	12/11/2019 23:50	13.8	0.33	0.02	0.12	12.9	12/11/2019 9:55	12/12/2019 5:55	20.1	0.91	1.11	65,577
12/12/2019 6:00	12/12/2019 17:55	11.9	0.19	0.02	0.24	10.2	12/12/2019 5:55	12/13/2019 5:55	24.1	1.22	1.32	105,459
12/14/2019 0:45	12/14/2019 18:05	17.3	0.45	0.03	0.24	31.9	12/14/2019 0:40	12/15/2019 0:20	23.8	1.72	2.40	146,919
12/15/2019 0:25	12/15/2019 4:05	3.7	0.06	0.02	0.12	8	12/15/2019 0:20	12/15/2019 16:05	15.8	2.26	2.40	128,883
12/18/2019 18:10	12/19/2019 3:05	8.9	0.32	0.04	0.12	86.5	12/18/2019 18:10	12/19/2019 12:20	18.3	1.12	1.25	73,578
12/19/2019 12:25	12/21/2019 14:45	50.3	4.42	0.09	0.96	11	12/19/2019 12:20	12/22/2019 2:45	62.5	13.02	20.46	2,929,515
12/22/2019 16:50	12/23/2019 3:30	10.7	0.19	0.02	0.12	27.4	12/22/2019 16:50	12/23/2019 13:05	20.3	9.46	11.02	692,821
12/23/2019 13:05	12/23/2019 13:30	0.4	0.05	0.12	0.12	12.6	12/23/2019 13:05	12/24/2019 1:25	12.4	7.33	7.83	327,729
12/30/2019 5:05	12/30/2019 8:05	3.0	0.08	0.03	0.12	159.9	12/30/2019 5:05	12/30/2019 20:00	15.0	1.00	1.05	54,258
12/30/2019 23:30	12/31/2019 16:05	16.6	0.13	0.01	0.24	16.7	12/30/2019 23:25	1/1/2020 4:05	26.9	0.96	0.99	92,841
1/1/2020 7:35	1/1/2020 7:40	0.1	0.18	2.16	1.44	16.2	1/1/2020 7:30	1/1/2020 19:25	12.0	1.08	1.11	46,458
1/1/2020 19:30	1/2/2020 2:15	6.8	0.48	0.07	0.48	11.8	1/1/2020 19:25	1/2/2020 11:55	16.6	1.73	2.19	103,503
1/2/2020 12:00	1/2/2020 19:15	7.3	0.12	0.02	0.12	10.8	1/2/2020 11:55	1/3/2020 7:15	19.4	2.83	3.15	197,640
1/3/2020 20:20	1/4/2020 3:25	7.1	0.22	0.03	0.12	30.3	1/3/2020 20:15	1/4/2020 15:20	19.2	1.94	2.19	133,863
1/5/2020 3:35	1/5/2020 15:25	11.8	0.42	0.04	0.48	27.3	1/5/2020 3:30	1/6/2020 0:40	21.3	1.87	2.29	143,244
1/6/2020 0:40	1/6/2020 8:45	8.1	0.05	0.01	0.12	9.7	1/6/2020 0:40	1/6/2020 18:55	18.3	2.04	2.09	134,340
1/6/2020 19:00	1/7/2020 9:10	14.2	0.35	0.02	0.12	28	1/6/2020 18:55	1/7/2020 15:40	20.8	2.44	2.76	182,749
1/7/2020 15:45	1/8/2020 1:50	10.1	0.15	0.01	0.12	9.8	1/7/2020 15:40	1/8/2020 3:55	12.3	2.63	2.76	116,964
1/8/2020 4:00	1/8/2020 5:25	1.4	0.03	0.02	0.12	7.9	1/8/2020 3:55	1/8/2020 17:25	13.6	2.44	2.76	119,121
1/8/2020 18:20	1/8/2020 19:20	1.0	0.04	0.04	0.12	16.5	1/8/2020 18:20	1/9/2020 7:15	13.0	2.11	2.29	98,862
1/9/2020 11:20	1/9/2020 12:05	0.8	0.1	0.13	0.24	17	1/9/2020 11:15	1/10/2020 0:00	12.8	1.79	1.99	82,794
1/10/2020 9:30	1/11/2020 23:55	38.4	1.42	0.04	0.36	21.8	1/10/2020 9:30	1/12/2020 6:15	44.8	3.95	7.37	638,100

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 ($feet^3$)
1/12/2020 6:15	1/12/2020 17:50	11.6	0.05	0.00	0.12	7.8	1/12/2020 6:15	1/13/2020 5:50	23.7	5.92	6.71	504,318
1/16/2020 10:55	1/16/2020 16:35	5.7	0.44	0.08	0.36	108.4	1/16/2020 10:50	1/17/2020 4:35	17.8	1.78	1.89	114,096
1/17/2020 11:00	1/17/2020 18:30	7.5	0.29	0.04	0.24	19.8	1/17/2020 11:00	1/18/2020 1:05	14.2	1.44	1.54	73,392
1/18/2020 1:05	1/18/2020 16:10	15.1	0.95	0.06	0.24	8.9	1/18/2020 1:05	1/19/2020 4:05	27.1	2.31	2.64	224,751
1/21/2020 3:45	1/21/2020 22:30	18.8	0.74	0.04	0.24	60.4	1/21/2020 3:40	1/22/2020 8:35	29.0	4.12	5.17	429,828
1/22/2020 8:35	1/25/2020 15:20	78.8	1.75	0.02	0.24	11.2	1/22/2020 8:35	1/26/2020 1:15	88.8	6.36	9.06	2,032,888
1/26/2020 1:15	1/26/2020 11:30	10.3	0.36	0.04	0.24	11.6	1/26/2020 1:15	1/26/2020 19:25	18.3	5.50	6.10	361,350
1/26/2020 19:30	1/26/2020 21:45	2.3	0.05	0.02	0.12	11.2	1/26/2020 19:25	1/27/2020 9:40	14.3	4.61	5.00	237,981
1/27/2020 17:30	1/28/2020 10:55	17.4	0.95	0.05	0.36	22	1/27/2020 17:25	1/28/2020 19:50	26.5	6.36	7.83	606,941
1/28/2020 19:55	1/28/2020 23:55	4.0	0.03	0.01	0.12	10.8	1/28/2020 19:50	1/29/2020 9:55	14.2	6.16	6.93	314,364
1/29/2020 9:55	1/29/2020 17:15	7.3	0.09	0.01	0.12	24.8	1/29/2020 9:55	1/30/2020 5:10	19.3	4.78	5.53	332,448
1/30/2020 17:05	2/2/2020 1:10	56.1	1.84	0.03	0.36	24.8	1/30/2020 17:00	2/2/2020 10:30	65.6	5.55	9.59	1,310,238
2/2/2020 10:35	2/2/2020 11:15	0.7	0.12	0.18	0.48	14.3	2/2/2020 10:30	2/2/2020 23:10	12.8	7.42	8.31	340,602
2/3/2020 1:55	2/3/2020 9:20	7.4	0.08	0.01	0.24	14.8	2/3/2020 1:55	2/3/2020 21:20	19.5	5.27	6.30	370,110
2/4/2020 12:30	2/7/2020 9:45	69.3	5.05	0.07	0.36	30.8	2/4/2020 12:30	2/7/2020 15:30	75.1	16.71	27.62	4,517,528
2/7/2020 15:30	2/7/2020 19:00	3.5	0.19	0.05	0.24	8	2/7/2020 15:30	2/8/2020 3:45	12.3	15.18	16.99	673,894
2/8/2020 3:50	2/8/2020 13:55	10.1	0.27	0.03	0.24	9.2	2/8/2020 3:45	2/9/2020 1:50	22.2	11.99	14.31	956,547
2/11/2020 19:20	2/11/2020 23:30	4.2	0.06	0.01	0.24	80.2	2/11/2020 19:15	2/12/2020 11:25	16.3	2.78	3.02	162,696
2/13/2020 9:35	2/13/2020 19:50	10.3	0.23	0.02	0.36	34.2	2/13/2020 9:30	2/14/2020 7:50	22.4	2.12	2.29	170,793
2/14/2020 21:15	2/15/2020 2:50	5.6	0.11	0.02	0.12	25.6	2/14/2020 21:10	2/15/2020 14:45	17.7	1.75	1.80	111,423
2/15/2020 17:50	2/16/2020 4:40	10.8	0.3	0.03	0.36	18.2	2/15/2020 17:45	2/16/2020 15:15	21.6	1.93	2.09	149,778
2/16/2020 15:15	2/16/2020 16:20	1.1	0.09	0.08	0.36	15.2	2/16/2020 15:15	2/17/2020 4:15	13.1	1.95	1.99	91,839
2/22/2020 23:00	2/22/2020 23:35	0.6	0.03	0.05	0.12	151	2/22/2020 23:00	2/23/2020 5:15	6.3	0.66	0.69	15,156
2/23/2020 5:20	2/23/2020 7:40	2.3	0.14	0.06	0.24	157.3	2/23/2020 5:15	2/23/2020 19:40	14.5	0.68	0.74	35,454
2/28/2020 17:00	2/29/2020 6:50	13.8	0.14	0.01	0.12	129.6	2/28/2020 17:00	2/29/2020 18:45	25.8	0.41	0.41	38,094
2/29/2020 22:05	3/1/2020 1:40	3.6	0.05	0.01	0.12	17.5	2/29/2020 22:05	3/1/2020 13:40	15.7	0.38	0.41	21,468
3/1/2020 18:45	3/3/2020 7:05	36.3	0.83	0.02	0.12	20.4	3/1/2020 18:40	3/3/2020 16:05	45.5	0.58	0.78	94,650
3/3/2020 16:10	3/3/2020 17:00	0.8	0.06	0.07	0.12	10.8	3/3/2020 16:05	3/4/2020 0:55	8.9	0.82	0.83	26,478
3/4/2020 0:55	3/4/2020 5:25	4.5	0.44	0.10	0.72	8.5	3/4/2020 0:55	3/4/2020 17:25	16.6	1.41	1.54	84,336
3/5/2020 20:45	3/6/2020 12:20	15.6	0.74	0.05	0.24	39.6	3/5/2020 20:45	3/7/2020 0:20	27.7	2.25	2.64	224,116
3/7/2020 12:00	3/7/2020 13:35	1.6	0.13	0.08	0.36	25.3	3/7/2020 11:55	3/7/2020 21:20	9.5	2.43	2.52	83,160
3/7/2020 21:20	3/8/2020 7:35	10.3	0.3	0.03	0.24	8.2	3/7/2020 21:20	3/8/2020 19:30	22.3	2.42	2.76	193,992
3/11/2020 4:05	3/11/2020 5:00	0.9	0.05	0.05	0.36	68.8	3/11/2020 4:05	3/11/2020 17:00	13.0	1.02	1.11	47,646
3/13/2020 5:35	3/13/2020 18:00	12.4	0.26	0.02	0.12	48.7	3/13/2020 5:35	3/14/2020 5:55	24.4	0.74	0.78	65,310
3/24/2020 19:10	3/25/2020 6:40	11.5	0.1	0.01	0.12	266.5	3/24/2020 19:05	3/25/2020 10:55	15.9	0.26	0.28	15,144
3/25/2020 10:55	3/25/2020 13:25	2.5	0.08	0.03	0.12	6.8	3/25/2020 10:55	3/26/2020 1:25	14.6	0.27	0.28	14,382
3/26/2020 12:05	3/26/2020 12:25	0.3	0.03	0.09	0.12	23	3/26/2020 12:00	3/26/2020 18:30	6.6	0.25	0.26	5,856
3/26/2020 18:30	3/26/2020 21:15	2.8	0.03	0.01	0.12	29.4	3/26/2020 18:30	3/27/2020 5:45	11.3	0.25	0.26	10,026
3/27/2020 5:45	3/27/2020 8:15	2.5	0.05	0.02	0.12	40.7	3/27/2020 5:45	3/27/2020 20:10	14.5	0.24	0.24	12,528
3/28/2020 2:00	3/28/2020 10:25	8.4	0.08	0.01	0.12	19.2	3/28/2020 2:00	3/28/2020 12:10	10.3	0.26	0.26	9,498
3/28/2020 12:10	3/29/2020 6:00	17.8	0.59	0.03	0.24	9.7	3/28/2020 12:10	3/29/2020 17:55	29.8	0.39	0.50	41,436
3/29/2020 20:05	3/30/2020 5:55	9.8	0.39	0.04	0.48	15.4	3/29/2020 20:05	3/30/2020 12:20	16.3	0.55	0.69	32,595
3/30/2020 12:20	3/31/2020 0:30	12.2	0.54	0.04	0.48	7.5	3/30/2020 12:20	3/31/2020 5:10	16.9	0.87	0.94	53,250
3/31/2020 5:10	3/31/2020 7:30	2.3	0.04	0.02	0.12	7.2	3/31/2020 5:10	3/31/2020 15:20	10.3	0.89	0.94	32,958
3/31/2020 15:20	3/31/2020 19:50	4.5	0.15	0.03	0.24	10.2	3/31/2020 15:20	4/1/2020 7:50	16.6	0.91	0.94	54,219
4/1/2020 11:20	4/1/2020 13:05	1.8	0.05	0.03	0.12	17.2	4/1/2020 11:15	4/2/2020 1:05	13.9	0.80	0.83	39,918

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 ($feet^3$)
4/3/2020 14:45	4/3/2020 21:55	7.2	0.24	0.03	0.24	51.3	4/3/2020 14:45	4/4/2020 9:55	19.3	0.57	0.61	39,714
4/18/2020 7:50	4/18/2020 10:40	2.8	0.04	0.01	0.12	346.4	4/18/2020 7:50	4/18/2020 22:40	14.9	0.12	0.12	6,444
4/22/2020 5:45	4/23/2020 10:50	29.1	1.19	0.04	0.24	93.9	4/22/2020 5:45	4/23/2020 16:25	34.8	0.29	0.47	35,667
4/23/2020 16:30	4/23/2020 21:25	4.9	0.16	0.03	0.24	7.9	4/23/2020 16:25	4/24/2020 9:25	17.1	0.46	0.47	28,113
4/25/2020 6:25	4/25/2020 11:00	4.6	0.31	0.07	0.36	33.4	4/25/2020 6:20	4/25/2020 23:00	16.8	0.59	0.69	35,475
4/26/2020 22:10	4/27/2020 1:45	3.6	0.1	0.03	0.12	36.8	4/26/2020 22:10	4/27/2020 13:40	15.6	0.48	0.50	26,808
4/29/2020 19:05	4/29/2020 19:50	0.8	0.06	0.08	0.24	65.8	4/29/2020 19:05	4/30/2020 7:50	12.8	0.28	0.30	13,110
5/2/2020 3:30	5/2/2020 18:40	15.2	0.48	0.03	0.48	56.3	5/2/2020 3:30	5/3/2020 6:40	27.3	0.30	0.41	29,406
5/5/2020 19:50	5/6/2020 16:55	21.1	0.47	0.02	0.6	77.2	5/5/2020 19:50	5/7/2020 4:50	33.1	0.31	0.44	36,657
5/11/2020 18:05	5/11/2020 23:50	5.8	0.16	0.03	0.48	121.3	5/11/2020 18:00	5/12/2020 11:50	17.9	0.20	0.20	12,882
5/13/2020 2:45	5/13/2020 6:55	4.2	0.07	0.02	0.12	30.1	5/13/2020 2:45	5/13/2020 18:55	16.3	0.18	0.20	10,536
5/14/2020 5:20	5/14/2020 9:50	4.5	0.13	0.03	0.24	23.6	5/14/2020 5:15	5/14/2020 21:50	16.7	0.19	0.20	11,106
5/16/2020 12:50	5/17/2020 6:45	17.9	0.64	0.04	0.36	53.2	5/16/2020 12:45	5/17/2020 18:40	30.0	0.27	0.44	28,875
5/20/2020 16:30	5/21/2020 10:45	18.3	0.78	0.04	0.36	86.8	5/20/2020 16:25	5/21/2020 14:25	22.1	0.47	0.88	37,170
5/21/2020 14:25	5/21/2020 17:30	3.1	0.29	0.09	0.36	8.2	5/21/2020 14:25	5/22/2020 5:25	15.1	1.04	1.11	56,673
5/22/2020 16:10	5/23/2020 3:40	11.5	0.2	0.02	0.24	22.9	5/22/2020 16:05	5/23/2020 15:40	23.7	0.96	1.05	81,543
5/25/2020 4:40	5/25/2020 18:50	14.2	0.34	0.02	0.12	50.6	5/25/2020 4:40	5/26/2020 6:45	26.2	0.64	0.69	60,336
5/30/2020 7:55	5/31/2020 11:05	27.2	1.45	0.05	0.84	110.6	5/30/2020 7:50	5/31/2020 23:00	39.3	1.71	2.29	241,020
6/6/2020 14:05	6/6/2020 14:10	0.1	0.05	0.60	0.48	147.6	6/6/2020 14:00	6/6/2020 22:40	8.8	0.27	0.28	8,490
6/6/2020 22:45	6/7/2020 12:30	13.8	0.68	0.05	0.84	8.6	6/6/2020 22:40	6/7/2020 18:50	20.3	0.60	0.69	43,686
6/7/2020 18:50	6/8/2020 3:45	8.9	0.11	0.01	0.24	8.7	6/7/2020 18:50	6/8/2020 15:40	20.9	0.86	0.94	64,740
6/9/2020 0:35	6/9/2020 20:35	20.0	0.41	0.02	0.12	26	6/9/2020 0:30	6/10/2020 8:35	32.2	0.95	1.05	110,208
6/11/2020 7:20	6/11/2020 13:30	6.2	0.21	0.03	0.12	36.2	6/11/2020 7:15	6/12/2020 1:25	18.3	0.70	0.78	45,966
6/12/2020 12:30	6/12/2020 15:05	2.6	0.18	0.07	0.24	24.7	6/12/2020 12:30	6/12/2020 21:55	9.5	0.67	0.69	22,878
6/12/2020 21:55	6/13/2020 0:25	2.5	0.07	0.03	0.24	7.3	6/12/2020 21:55	6/13/2020 12:20	14.5	0.71	0.94	37,158
6/13/2020 20:55	6/14/2020 0:05	3.2	0.33	0.10	0.6	20.9	6/13/2020 20:55	6/14/2020 12:00	15.2	1.09	1.25	59,412
6/15/2020 4:45	6/15/2020 14:35	9.8	0.19	0.02	0.24	28.8	6/15/2020 4:45	6/16/2020 2:35	21.9	0.98	1.11	77,406
6/16/2020 3:50	6/16/2020 8:30	4.7	0.07	0.02	0.24	17.8	6/16/2020 3:45	6/16/2020 20:25	16.8	0.80	0.88	48,318
6/20/2020 5:20	6/20/2020 8:25	3.1	0.03	0.01	0.12	96.8	6/20/2020 5:15	6/20/2020 20:25	15.3	0.27	0.30	15,090
6/21/2020 5:30	6/21/2020 6:20	0.8	0.08	0.10	0.24	120.9	6/21/2020 5:25	6/21/2020 18:20	13.0	0.26	0.28	12,084
6/27/2020 12:00	6/28/2020 7:15	19.3	0.38	0.02	0.12	149.8	6/27/2020 12:00	6/28/2020 19:15	31.3	0.20	0.26	23,118
7/1/2020 15:00	7/1/2020 16:55	1.9	0.03	0.02	0.12	82.1	7/1/2020 14:55	7/2/2020 4:50	14.0	0.15	0.15	7,560
7/7/2020 11:40	7/7/2020 13:20	1.7	0.03	0.02	0.12	222.8	7/7/2020 11:35	7/8/2020 1:15	13.8	0.10	0.10	4,950
7/12/2020 4:10	7/12/2020 9:50	5.7	0.12	0.02	0.12	335.2	7/12/2020 4:10	7/12/2020 21:45	17.7	0.09	0.12	5,892
7/24/2020 0:45	7/24/2020 2:10	1.4	0.04	0.03	0.12	281.4	7/24/2020 0:40	7/24/2020 14:10	13.6	0.03	0.04	1,533
8/6/2020 7:00	8/6/2020 17:20	10.3	0.57	0.06	0.72	318.2	8/6/2020 6:55	8/7/2020 5:15	22.4	0.05	0.14	3,951
8/8/2020 4:50	8/8/2020 10:15	5.4	0.16	0.03	0.24	42.6	8/8/2020 4:50	8/8/2020 22:15	17.5	0.04	0.05	2,526
8/20/2020 20:00	8/20/2020 23:45	3.8	0.09	0.02	0.24	299.2	8/20/2020 23:20	8/21/2020 6:55	6.9	0.01	0.01	249
8/21/2020 7:00	8/21/2020 12:55	5.9	0.05	0.01	0.12	7.6	8/21/2020 6:55	8/21/2020 17:00	8.3	0.01	0.01	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)
10/3/2019 1:50	10/3/2019 4:05	2.3	0.04	0.02	0.12	96.8	10/3/2019 1:50	10/3/2019 16:05	14.3	0.23	0.24	11,904
10/3/2019 22:15	10/4/2019 4:40	6.4	0.06	0.01	0.12	20.4	10/3/2019 22:15	10/4/2019 16:40	18.5	0.21	0.24	14,100
10/7/2019 18:45	10/8/2019 16:20	21.6	0.82	0.04	0.72	87.8	10/7/2019 18:40	10/9/2019 4:15	33.7	0.27	0.42	32,256
10/16/2019 5:20	10/16/2019 9:50	4.5	0.13	0.03	0.24	181.2	10/16/2019 5:20	10/16/2019 15:45	10.5	0.23	0.24	8,592
10/16/2019 15:45	10/16/2019 20:25	4.7	0.25	0.05	0.24	6.8	10/16/2019 15:45	10/17/2019 3:30	11.8	0.26	0.35	11,061
10/17/2019 3:35	10/17/2019 17:40	14.1	0.13	0.01	0.36	7.4	10/17/2019 3:30	10/18/2019 5:35	26.2	0.24	0.29	22,482
10/18/2019 15:10	10/19/2019 15:00	23.8	0.98	0.04	0.36	25.2	10/18/2019 15:10	10/20/2019 3:00	35.9	0.48	0.58	61,779
10/20/2019 7:20	10/20/2019 22:50	15.5	0.49	0.03	0.72	19.7	10/20/2019 7:20	10/21/2019 7:05	23.8	0.47	0.58	40,218
10/21/2019 7:05	10/22/2019 6:45	23.7	1.02	0.04	0.60	8.3	10/21/2019 7:05	10/22/2019 18:40	35.7	0.75	0.97	96,540
10/25/2019 9:30	10/25/2019 12:05	2.6	0.13	0.05	0.12	77.4	10/25/2019 9:30	10/25/2019 18:40	9.3	0.42	0.49	13,881
10/25/2019 18:40	10/25/2019 21:10	2.5	0.21	0.08	0.60	7.2	10/25/2019 18:40	10/26/2019 9:10	14.6	0.49	0.53	25,764
11/9/2019 0:45	11/9/2019 16:20	15.6	0.27	0.02	0.24	339.9	11/9/2019 0:40	11/10/2019 4:15	27.7	0.32	0.35	32,322
11/12/2019 4:00	11/12/2019 8:15	4.3	0.31	0.07	0.12	60.6	11/12/2019 3:55	11/12/2019 20:10	16.3	0.35	0.49	20,724
11/15/2019 3:35	11/15/2019 10:35	7.0	0.23	0.03	0.24	68.3	11/15/2019 3:30	11/15/2019 17:05	13.7	0.31	0.42	15,330
11/15/2019 17:05	11/15/2019 20:20	3.3	1.50	0.46	2.40	11.9	11/15/2019 17:05	11/16/2019 8:15	15.3	1.13	2.27	61,863
11/16/2019 14:25	11/17/2019 20:30	30.1	0.47	0.02	0.36	18.2	11/16/2019 14:25	11/18/2019 8:30	42.2	0.46	0.68	70,227
11/18/2019 11:50	11/19/2019 10:05	22.3	0.53	0.02	0.48	16.8	11/18/2019 11:50	11/19/2019 22:05	34.3	0.52	0.58	64,011
11/23/2019 23:40	11/24/2019 1:45	2.1	0.12	0.06	0.24	112.3	11/23/2019 23:35	11/24/2019 13:40	14.2	0.20	0.24	10,380
11/24/2019 21:40	11/25/2019 22:40	25.0	0.81	0.03	0.48	20.3	11/24/2019 21:40	11/26/2019 10:40	37.1	0.43	0.53	57,252
12/1/2019 11:30	12/1/2019 15:40	4.2	0.06	0.01	0.12	134.7	12/1/2019 11:30	12/2/2019 3:40	16.3	0.20	0.20	11,496
12/4/2019 6:15	12/4/2019 7:55	1.7	0.04	0.02	0.12	66.6	12/4/2019 6:10	12/4/2019 19:50	13.8	0.16	0.16	7,920
12/6/2019 20:35	12/7/2019 17:25	20.8	0.41	0.02	0.12	62.3	12/6/2019 20:35	12/8/2019 5:25	32.9	0.20	0.24	23,436
12/10/2019 11:40	12/10/2019 23:50	12.2	0.26	0.02	0.12	74.8	12/10/2019 11:35	12/11/2019 9:55	22.4	0.19	0.20	15,708
12/11/2019 10:00	12/11/2019 23:50	13.8	0.33	0.02	0.12	12.9	12/11/2019 9:55	12/12/2019 5:55	20.1	0.22	0.29	16,002
12/12/2019 6:00	12/12/2019 17:55	11.9	0.19	0.02	0.24	10.2	12/12/2019 5:55	12/13/2019 5:55	24.1	0.27	0.29	23,073
12/14/2019 0:45	12/14/2019 18:05	17.3	0.45	0.03	0.24	31.9	12/14/2019 0:40	12/15/2019 0:20	23.8	0.37	0.53	31,647
12/15/2019 0:25	12/15/2019 4:05	3.7	0.06	0.02	0.12	8	12/15/2019 0:20	12/15/2019 16:05	15.8	0.43	0.49	24,591
12/18/2019 18:10	12/19/2019 3:05	8.9	0.32	0.04	0.12	86.5	12/18/2019 18:10	12/19/2019 12:20	18.3	0.27	0.29	17,751
12/19/2019 12:25	12/21/2019 14:45	50.3	4.42	0.09	0.96	11	12/19/2019 12:20	12/22/2019 2:45	62.5	4.13	8.32	929,805
12/22/2019 16:50	12/23/2019 3:30	10.7	0.19	0.02	0.12	27.4	12/22/2019 16:50	12/23/2019 13:05	20.3	1.51	1.89	110,358
12/23/2019 13:05	12/23/2019 13:30	0.4	0.05	0.12	0.12	12.6	12/23/2019 13:05	12/24/2019 1:25	12.4	1.07	1.24	47,700
12/30/2019 5:05	12/30/2019 8:05	3.0	0.08	0.03	0.12	159.9	12/30/2019 5:05	12/30/2019 20:00	15.0	0.35	0.35	18,810
12/30/2019 23:30	12/31/2019 16:05	16.6	0.13	0.01	0.24	16.7	12/30/2019 23:25	1/1/2020 4:05	27.8	0.35	0.42	34,797
1/1/2020 7:35	1/1/2020 7:40	0.1	0.18	2.16	1.44	16.2	1/1/2020 7:30	1/1/2020 19:25	12.0	0.40	0.58	17,406
1/1/2020 19:30	1/2/2020 2:15	6.8	0.48	0.07	0.48	11.8	1/1/2020 19:25	1/2/2020 11:55	16.6	0.55	0.58	32,766
1/2/2020 12:00	1/2/2020 19:15	7.3	0.12	0.02	0.12	10.8	1/2/2020 11:55	1/3/2020 7:15	19.4	0.57	0.63	39,702
1/3/2020 20:20	1/4/2020 3:25	7.1	0.22	0.03	0.12	30.3	1/3/2020 20:15	1/4/2020 15:20	19.2	0.54	0.63	37,206
1/5/2020 3:35	1/5/2020 15:25	11.8	0.42	0.04	0.48	27.3	1/5/2020 3:30	1/6/2020 0:40	21.3	0.62	0.73	47,130
1/6/2020 0:40	1/6/2020 8:45	8.1	0.05	0.01	0.12	9.7	1/6/2020 0:40	1/6/2020 18:55	18.3	0.65	0.68	43,020
1/6/2020 19:00	1/7/2020 9:10	14.2	0.35	0.02	0.12	28	1/6/2020 18:55	1/7/2020 15:40	20.8	0.72	0.79	53,931
1/7/2020 15:45	1/8/2020 1:50	10.1	0.15	0.01	0.12	9.8	1/7/2020 15:40	1/8/2020 3:55	12.3	0.74	0.79	32,640
1/8/2020 4:00	1/8/2020 5:25	1.4	0.03	0.02	0.12	7.9	1/8/2020 3:55	1/8/2020 17:25	13.6	0.66	0.73	32,142

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)
1/8/2020 18:20	1/8/2020 19:20	1.0	0.04	0.04	0.12	16.5	1/8/2020 18:20	1/9/2020 7:15	13.0	0.60	0.63	28,089
1/9/2020 11:20	1/9/2020 12:05	0.8	0.10	0.13	0.24	17	1/9/2020 11:15	1/10/2020 0:00	12.8	0.55	0.58	25,581
1/10/2020 9:30	1/11/2020 23:55	38.4	1.42	0.04	0.36	21.8	1/10/2020 9:30	1/12/2020 6:15	44.8	1.06	1.71	171,249
1/12/2020 6:15	1/12/2020 17:50	11.6	0.05	0.00	0.12	7.8	1/12/2020 6:15	1/13/2020 5:50	23.7	1.41	1.54	119,880
1/16/2020 10:55	1/16/2020 16:35	5.7	0.44	0.08	0.36	108.4	1/16/2020 10:50	1/17/2020 4:35	17.8	0.72	0.79	46,146
1/17/2020 11:00	1/17/2020 18:30	7.5	0.29	0.04	0.24	19.8	1/17/2020 11:00	1/18/2020 1:05	14.2	0.63	0.63	32,130
1/18/2020 1:05	1/18/2020 16:10	15.1	0.95	0.06	0.24	8.9	1/18/2020 1:05	1/19/2020 4:05	27.1	0.91	1.03	88,698
1/21/2020 3:45	1/21/2020 22:30	18.8	0.74	0.04	0.24	60.4	1/21/2020 3:40	1/22/2020 8:35	29.0	1.12	1.31	116,403
1/22/2020 8:35	1/25/2020 15:20	78.8	1.75	0.02	0.24	11.2	1/22/2020 8:35	1/26/2020 1:15	88.8	1.54	2.07	490,442
1/26/2020 1:15	1/26/2020 11:30	10.3	0.36	0.04	0.24	11.6	1/26/2020 1:15	1/26/2020 19:25	18.3	1.42	1.63	93,177
1/26/2020 19:30	1/26/2020 21:45	2.3	0.05	0.02	0.12	11.2	1/26/2020 19:25	1/27/2020 9:40	14.3	1.24	1.39	63,798
1/27/2020 17:30	1/28/2020 10:55	17.4	0.95	0.05	0.36	22	1/27/2020 17:25	1/28/2020 19:50	26.5	1.55	1.89	148,269
1/28/2020 19:55	1/28/2020 23:55	4.0	0.03	0.01	0.12	10.8	1/28/2020 19:50	1/29/2020 9:55	14.2	1.39	1.54	70,911
1/29/2020 9:55	1/29/2020 17:15	7.3	0.09	0.01	0.12	24.8	1/29/2020 9:55	1/30/2020 5:10	19.3	1.15	1.31	80,031
1/30/2020 17:05	2/2/2020 1:10	56.1	1.84	0.03	0.36	24.8	1/30/2020 17:00	2/2/2020 10:30	65.6	1.41	2.47	332,376
2/2/2020 10:35	2/2/2020 11:15	0.7	0.12	0.18	0.48	14.3	2/2/2020 10:30	2/2/2020 23:10	12.8	1.57	1.71	72,165
2/3/2020 1:55	2/3/2020 9:20	7.4	0.08	0.01	0.24	14.8	2/3/2020 1:55	2/3/2020 21:20	19.5	1.20	1.31	83,940
2/4/2020 12:30	2/7/2020 9:45	69.3	5.05	0.07	0.36	30.8	2/4/2020 12:30	2/7/2020 15:30	75.1	6.72	12.48	1,817,486
2/7/2020 15:30	2/7/2020 19:00	3.5	0.19	0.05	0.24	8	2/7/2020 15:30	2/8/2020 3:45	12.3	4.85	5.56	215,538
2/8/2020 3:50	2/8/2020 13:55	10.1	0.27	0.03	0.24	9.2	2/8/2020 3:45	2/9/2020 1:50	22.2	3.72	4.33	296,818
2/11/2020 19:20	2/11/2020 23:30	4.2	0.06	0.01	0.24	80.2	2/11/2020 19:15	2/12/2020 11:25	16.3	2.04	2.07	119,394
2/13/2020 9:35	2/13/2020 19:50	10.3	0.23	0.02	0.36	34.2	2/13/2020 9:30	2/14/2020 7:50	22.4	1.90	2.37	153,219
2/14/2020 21:15	2/15/2020 2:50	5.6	0.11	0.02	0.12	25.6	2/14/2020 21:10	2/15/2020 14:45	17.7	1.73	2.17	110,148
2/15/2020 17:50	2/16/2020 4:40	10.8	0.30	0.03	0.36	18.2	2/15/2020 17:45	2/16/2020 15:15	21.6	1.83	2.69	142,422
2/16/2020 15:15	2/16/2020 16:20	1.1	0.09	0.08	0.36	15.2	2/16/2020 15:15	2/17/2020 4:15	13.1	1.63	2.07	76,890
2/22/2020 23:00	2/22/2020 23:35	0.6	0.03	0.05	0.12	151	2/22/2020 23:00	2/23/2020 5:15	6.3	0.79	0.79	18,012
2/23/2020 5:20	2/23/2020 7:40	2.3	0.14	0.06	0.24	157.3	2/23/2020 5:15	2/23/2020 19:40	14.5	0.80	0.85	41,508
2/28/2020 17:00	2/29/2020 6:50	13.8	0.14	0.01	0.12	129.6	2/28/2020 17:00	2/29/2020 18:45	25.8	0.58	0.63	53,865
2/29/2020 22:05	3/1/2020 1:40	3.6	0.05	0.01	0.12	17.5	2/29/2020 22:05	3/1/2020 13:40	15.7	0.54	0.58	30,177
3/1/2020 18:45	3/3/2020 7:05	36.3	0.83	0.02	0.12	20.4	3/1/2020 18:40	3/3/2020 16:05	45.5	0.73	0.85	119,565
3/3/2020 16:10	3/3/2020 17:00	0.8	0.06	0.07	0.12	10.8	3/3/2020 16:05	3/4/2020 0:55	8.9	0.78	0.79	25,017
3/4/2020 0:55	3/4/2020 5:25	4.5	0.44	0.10	0.72	8.5	3/4/2020 0:55	3/4/2020 17:25	16.6	0.88	0.91	52,653
3/5/2020 20:45	3/6/2020 12:20	15.6	0.74	0.05	0.24	39.6	3/5/2020 20:45	3/7/2020 0:20	27.7	1.11	1.46	110,736
3/7/2020 12:00	3/7/2020 13:35	1.6	0.13	0.08	0.36	25.3	3/7/2020 11:55	3/7/2020 21:20	9.5	0.82	0.91	28,188
3/7/2020 21:20	3/8/2020 7:35	10.3	0.30	0.03	0.24	8.2	3/7/2020 21:20	3/8/2020 19:30	22.3	0.85	0.91	67,725
3/11/2020 4:05	3/11/2020 5:00	0.9	0.05	0.05	0.36	68.8	3/11/2020 4:05	3/11/2020 17:00	13.0	0.58	0.58	27,144
3/13/2020 5:35	3/13/2020 18:00	12.4	0.26	0.02	0.12	48.7	3/13/2020 5:35	3/14/2020 5:55	24.4	0.56	0.58	49,020
3/24/2020 19:10	3/25/2020 6:40	11.5	0.10	0.01	0.12	266.5	3/24/2020 19:05	3/25/2020 10:55	15.9	0.26	0.29	14,652
3/25/2020 10:55	3/25/2020 13:25	2.5	0.08	0.03	0.12	6.8	3/25/2020 10:55	3/26/2020 1:25	14.6	0.29	0.29	15,225
3/26/2020 12:05	3/26/2020 12:25	0.3	0.03	0.09	0.12	23	3/26/2020 12:00	3/26/2020 18:30	6.6	0.29	0.29	6,858
3/26/2020 18:30	3/26/2020 21:15	2.8	0.03	0.01	0.12	29.4	3/26/2020 18:30	3/27/2020 5:45	11.3	0.28	0.29	11,427
3/27/2020 5:45	3/27/2020 8:15	2.5	0.05	0.02	0.12	40.7	3/27/2020 5:45	3/27/2020 20:10	14.5	0.28	0.29	14,763
3/28/2020 2:00	3/28/2020 10:25	8.4	0.08	0.01	0.12	19.2	3/28/2020 2:00	3/28/2020 12:10	10.3	0.29	0.29	10,701

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)
3/28/2020 12:10	3/29/2020 6:00	17.8	0.59	0.03	0.24	9.7	3/28/2020 12:10	3/29/2020 17:55	29.8	0.45	0.58	48,204
3/29/2020 20:05	3/30/2020 5:55	9.8	0.39	0.04	0.48	15.4	3/29/2020 20:05	3/30/2020 12:20	16.3	0.55	0.68	32,115
3/30/2020 12:20	3/31/2020 0:30	12.2	0.54	0.04	0.48	7.5	3/30/2020 12:20	3/31/2020 5:10	16.9	0.70	0.79	42,330
3/31/2020 5:10	3/31/2020 7:30	2.3	0.04	0.02	0.12	7.2	3/31/2020 5:10	3/31/2020 15:20	10.3	0.65	0.68	24,147
3/31/2020 15:20	3/31/2020 19:50	4.5	0.15	0.03	0.24	10.2	3/31/2020 15:20	4/1/2020 7:50	16.6	0.60	0.68	36,006
4/1/2020 11:20	4/1/2020 13:05	1.8	0.05	0.03	0.12	17.2	4/1/2020 11:15	4/2/2020 1:05	13.9	0.54	0.58	26,868
4/3/2020 14:45	4/3/2020 21:55	7.2	0.24	0.03	0.24	51.3	4/3/2020 14:45	4/4/2020 9:55	19.3	0.49	0.53	34,005
4/18/2020 7:50	4/18/2020 10:40	2.8	0.04	0.01	0.12	346.4	4/18/2020 7:50	4/18/2020 22:40	14.9	0.24	0.24	12,888
4/22/2020 5:45	4/23/2020 10:50	29.1	1.19	0.04	0.24	93.9	4/22/2020 5:45	4/23/2020 16:25	34.8	0.64	0.97	79,818
4/23/2020 16:30	4/23/2020 21:25	4.9	0.16	0.03	0.24	7.9	4/23/2020 16:25	4/24/2020 9:25	17.1	0.67	0.85	41,448
4/25/2020 6:25	4/25/2020 11:00	4.6	0.31	0.07	0.36	33.4	4/25/2020 6:20	4/25/2020 23:00	16.8	0.57	0.68	34,443
4/26/2020 22:10	4/27/2020 1:45	3.6	0.10	0.03	0.12	36.8	4/26/2020 22:10	4/27/2020 13:40	15.6	0.43	0.49	23,919
4/29/2020 19:05	4/29/2020 19:50	0.8	0.06	0.08	0.24	65.8	4/29/2020 19:05	4/30/2020 7:50	12.8	0.35	0.35	16,134
5/2/2020 3:30	5/2/2020 18:40	15.2	0.48	0.03	0.48	56.3	5/2/2020 3:30	5/3/2020 6:40	27.3	0.51	0.73	49,728
5/5/2020 19:50	5/6/2020 16:55	21.1	0.47	0.02	0.60	77.2	5/5/2020 19:50	5/7/2020 4:50	33.1	0.60	1.24	71,757
5/11/2020 18:05	5/11/2020 23:50	5.8	0.16	0.03	0.48	121.3	5/11/2020 18:00	5/12/2020 11:50	17.9	0.29	0.29	18,690
5/13/2020 2:45	5/13/2020 6:55	4.2	0.07	0.02	0.12	30.1	5/13/2020 2:45	5/13/2020 18:55	16.3	0.30	0.35	17,307
5/14/2020 5:20	5/14/2020 9:50	4.5	0.13	0.03	0.24	23.6	5/14/2020 5:15	5/14/2020 21:50	16.7	0.30	0.35	17,976
5/16/2020 12:50	5/17/2020 6:45	17.9	0.64	0.04	0.36	53.2	5/16/2020 12:45	5/17/2020 18:40	30.0	0.46	0.73	49,965
5/20/2020 16:30	5/21/2020 10:45	18.3	0.78	0.04	0.36	86.8	5/20/2020 16:25	5/21/2020 14:25	22.1	0.78	1.24	61,809
5/21/2020 14:25	5/21/2020 17:30	3.1	0.29	0.09	0.36	8.2	5/21/2020 14:25	5/22/2020 5:25	15.1	1.05	1.24	56,982
5/22/2020 16:10	5/23/2020 3:40	11.5	0.20	0.02	0.24	22.9	5/22/2020 16:05	5/23/2020 15:40	23.7	0.69	0.79	59,100
5/25/2020 4:40	5/25/2020 18:50	14.2	0.34	0.02	0.12	50.6	5/25/2020 4:40	5/26/2020 6:45	26.2	0.56	0.68	52,878
5/30/2020 7:55	5/31/2020 11:05	27.2	1.45	0.05	0.84	110.6	5/30/2020 7:50	5/31/2020 23:00	39.3	0.77	0.97	108,717
6/6/2020 14:05	6/6/2020 14:10	0.1	0.05	0.60	0.48	147.6	6/6/2020 14:00	6/6/2020 22:40	8.8	0.29	0.29	9,135
6/6/2020 22:45	6/7/2020 12:30	13.8	0.68	0.05	0.84	8.6	6/6/2020 22:40	6/7/2020 18:50	20.3	0.50	0.53	36,225
6/7/2020 18:50	6/8/2020 3:45	8.9	0.11	0.01	0.24	8.7	6/7/2020 18:50	6/8/2020 15:40	20.9	0.57	0.73	42,558
6/9/2020 0:35	6/9/2020 20:35	20.0	0.41	0.02	0.12	26	6/9/2020 0:30	6/10/2020 8:35	32.2	0.51	0.53	58,914
6/11/2020 7:20	6/11/2020 13:30	6.2	0.21	0.03	0.12	36.2	6/11/2020 7:15	6/12/2020 1:25	18.3	0.43	0.49	28,266
6/12/2020 12:30	6/12/2020 15:05	2.6	0.18	0.07	0.24	24.7	6/12/2020 12:30	6/12/2020 21:55	9.5	0.45	0.49	15,225
6/12/2020 21:55	6/13/2020 0:25	2.5	0.07	0.03	0.24	7.3	6/12/2020 21:55	6/13/2020 12:20	14.5	0.46	0.49	24,150
6/13/2020 20:55	6/14/2020 0:05	3.2	0.33	0.10	0.60	20.9	6/13/2020 20:55	6/14/2020 12:00	15.2	0.51	0.58	28,077
6/15/2020 4:45	6/15/2020 14:35	9.8	0.19	0.02	0.24	28.8	6/15/2020 4:45	6/16/2020 2:35	21.9	0.41	0.42	32,277
6/16/2020 3:50	6/16/2020 8:30	4.7	0.07	0.02	0.24	17.8	6/16/2020 3:45	6/16/2020 20:25	16.8	0.41	0.49	24,528
6/20/2020 5:20	6/20/2020 8:25	3.1	0.03	0.01	0.12	96.8	6/20/2020 5:15	6/20/2020 20:25	15.3	0.35	0.35	18,963
6/21/2020 5:30	6/21/2020 6:20	0.8	0.08	0.10	0.24	120.9	6/21/2020 5:25	6/21/2020 18:20	13.0	0.34	0.35	15,750
6/27/2020 12:00	6/28/2020 7:15	19.3	0.38	0.02	0.12	149.8	6/27/2020 12:00	6/28/2020 19:15	31.3	0.29	0.35	32,841
7/1/2020 15:00	7/1/2020 16:55	1.9	0.03	0.02	0.12	82.1	7/1/2020 14:55	7/2/2020 4:50	14.0	0.25	0.29	12,651
7/7/2020 11:40	7/7/2020 13:20	1.7	0.03	0.02	0.12	222.8	7/7/2020 11:35	7/8/2020 1:15	13.8	0.35	0.35	17,307
7/12/2020 4:10	7/12/2020 9:50	5.7	0.12	0.02	0.12	335.2	7/12/2020 4:10	7/12/2020 21:45	17.7	0.29	0.35	18,210
7/24/2020 0:45	7/24/2020 2:10	1.4	0.04	0.03	0.12	281.4	7/24/2020 0:40	7/24/2020 14:10	13.6	0.24	0.24	11,736
8/6/2020 7:00	8/6/2020 17:20	10.3	0.57	0.06	0.72	318.2	8/6/2020 6:55	8/7/2020 5:15	22.4	0.19	0.42	15,198
8/8/2020 4:50	8/8/2020 10:15	5.4	0.16	0.03	0.24	42.6	8/8/2020 4:50	8/8/2020 22:15	17.5	0.17	0.24	10,788

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)
8/20/2020 20:00	8/20/2020 23:45	3.8	0.09	0.02	0.24	299.2	8/20/2020 20:00	8/21/2020 6:55	11.0	0.18	0.20	7,044
8/21/2020 7:00	8/21/2020 12:55	5.9	0.05	0.01	0.12	7.6	8/21/2020 6:55	8/21/2020 17:00	10.2	0.19	0.20	7,032

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)
10/3/2019 1:50	10/3/2019 4:05	2.3	0.04	0.02	0.12	96.8	10/3/2019 1:50	10/3/2019 16:05	14.3	0.21	0.25	11,031
10/3/2019 22:15	10/4/2019 4:40	6.4	0.06	0.01	0.12	20.4	10/3/2019 22:15	10/4/2019 16:40	18.5	0.22	0.25	14,400
10/7/2019 18:45	10/8/2019 16:20	21.6	0.82	0.04	0.72	87.8	10/7/2019 18:40	10/9/2019 4:15	33.7	0.41	0.73	49,158
10/16/2019 5:20	10/16/2019 9:50	4.5	0.13	0.03	0.24	181.2	10/16/2019 5:20	10/16/2019 15:45	10.5	0.21	0.25	8,118
10/16/2019 15:45	10/16/2019 20:25	4.7	0.25	0.05	0.24	6.8	10/16/2019 15:45	10/17/2019 3:30	11.8	0.33	0.50	14,061
10/17/2019 3:35	10/17/2019 17:40	14.1	0.13	0.01	0.36	7.4	10/17/2019 3:30	10/18/2019 5:35	26.2	0.25	0.29	23,406
10/18/2019 15:10	10/19/2019 15:00	23.8	0.98	0.04	0.36	25.2	10/18/2019 15:10	10/20/2019 3:00	35.9	0.54	1.09	70,200
10/20/2019 7:20	10/20/2019 22:50	15.5	0.49	0.03	0.72	19.7	10/20/2019 7:20	10/21/2019 7:05	23.8	0.40	0.80	33,906
10/21/2019 7:05	10/22/2019 6:45	23.7	1.02	0.04	0.60	8.3	10/21/2019 7:05	10/22/2019 18:40	35.7	0.64	1.17	82,332
10/25/2019 9:30	10/25/2019 12:05	2.6	0.13	0.05	0.12	77.4	10/25/2019 9:30	10/25/2019 18:40	9.3	0.34	0.41	11,373
10/25/2019 18:40	10/25/2019 21:10	2.5	0.21	0.08	0.60	7.2	10/25/2019 18:40	10/26/2019 9:10	14.6	0.37	0.41	19,589
11/9/2019 0:45	11/9/2019 16:20	15.6	0.27	0.02	0.24	339.9	11/9/2019 0:40	11/10/2019 4:15	27.7	0.37	0.50	36,726
11/12/2019 4:00	11/12/2019 8:15	4.3	0.31	0.07	0.12	60.6	11/12/2019 3:55	11/12/2019 20:10	16.3	0.40	0.55	23,331
11/15/2019 3:35	11/15/2019 10:35	7.0	0.23	0.03	0.24	68.3	11/15/2019 3:30	11/15/2019 17:05	13.7	0.40	0.55	19,455
11/15/2019 17:05	11/15/2019 20:20	3.3	1.50	0.46	2.40	11.9	11/15/2019 17:05	11/16/2019 8:15	15.3	1.73	6.17	94,992
11/16/2019 14:25	11/17/2019 20:30	30.1	0.47	0.02	0.36	18.2	11/16/2019 14:25	11/18/2019 8:30	42.2	0.60	0.80	91,347
11/18/2019 11:50	11/19/2019 10:05	22.3	0.53	0.02	0.48	16.8	11/18/2019 11:50	11/19/2019 22:05	34.3	0.59	0.87	73,110
11/23/2019 23:40	11/24/2019 1:45	2.1	0.12	0.06	0.24	112.3	11/23/2019 23:35	11/24/2019 13:40	14.2	0.31	0.41	15,726
11/24/2019 21:40	11/25/2019 22:40	25.0	0.81	0.03	0.48	20.3	11/24/2019 21:40	11/26/2019 10:40	37.1	0.56	0.73	75,360
12/1/2019 11:30	12/1/2019 15:40	4.2	0.06	0.01	0.12	134.7	12/1/2019 11:30	12/2/2019 3:40	16.3	0.28	0.33	16,089
12/4/2019 6:15	12/4/2019 7:55	1.7	0.04	0.02	0.12	66.6	12/4/2019 6:10	12/4/2019 19:50	13.8	0.33	0.37	16,467
12/6/2019 20:35	12/7/2019 17:25	20.8	0.41	0.02	0.12	62.3	12/6/2019 20:35	12/8/2019 5:25	32.9	0.36	0.55	42,642
12/10/2019 11:40	12/10/2019 23:50	12.2	0.26	0.02	0.12	74.8	12/10/2019 11:35	12/11/2019 9:55	22.4	0.35	0.41	28,203
12/11/2019 10:00	12/11/2019 23:50	13.8	0.33	0.02	0.12	12.9	12/11/2019 9:55	12/12/2019 5:55	20.1	0.42	0.50	30,081
12/12/2019 6:00	12/12/2019 17:55	11.9	0.19	0.02	0.24	10.2	12/12/2019 5:55	12/13/2019 5:55	24.1	0.37	0.41	31,995
12/14/2019 0:45	12/14/2019 18:05	17.3	0.45	0.03	0.24	31.9	12/14/2019 0:40	12/15/2019 0:20	23.8	0.56	0.87	48,240
12/15/2019 0:25	12/15/2019 4:05	3.7	0.06	0.02	0.12	8	12/15/2019 0:20	12/15/2019 16:05	15.8	0.49	0.55	27,840
12/18/2019 18:10	12/19/2019 3:05	8.9	0.32	0.04	0.12	86.5	12/18/2019 18:10	12/19/2019 12:20	18.3	0.49	0.67	32,160
12/19/2019 12:25	12/21/2019 14:45	50.3	4.42	0.09	0.96	11	12/19/2019 12:20	12/22/2019 2:45	62.5	3.80	8.49	855,360
12/22/2019 16:50	12/23/2019 3:30	10.7	0.19	0.02	0.12	27.4	12/22/2019 16:50	12/23/2019 13:05	20.3	1.17	1.42	85,443
12/23/2019 13:05	12/23/2019 13:30	0.4	0.05	0.12	0.12	12.6	12/23/2019 13:05	12/24/2019 1:25	12.4	0.91	1.01	40,485
12/30/2019 5:05	12/30/2019 8:05	3.0	0.08	0.03	0.12	159.9	12/30/2019 5:05	12/30/2019 20:00	15.0	0.47	0.50	25,155
12/30/2019 23:30	12/31/2019 16:05	16.6	0.13	0.01	0.24	16.7	12/30/2019 23:25	1/1/2020 4:05	27.8	0.45	0.50	44,868
1/1/2020 7:35	1/1/2020 7:40	0.1	0.18	2.16	1.44	16.2	1/1/2020 7:30	1/1/2020 19:25	12.0	0.63	1.09	27,144
1/1/2020 19:30	1/2/2020 2:15	6.8	0.48	0.07	0.48	11.8	1/1/2020 19:25	1/2/2020 11:55	16.6	0.72	0.94	43,197
1/2/2020 12:00	1/2/2020 19:15	7.3	0.12	0.02	0.12	10.8	1/2/2020 11:55	1/3/2020 7:15	19.4	0.56	0.61	39,330
1/3/2020 20:20	1/4/2020 3:25	7.1	0.22	0.03	0.12	30.3	1/3/2020 20:15	1/4/2020 15:20	19.2	0.56	0.73	38,355
1/5/2020 3:35	1/5/2020 15:25	11.8	0.42	0.04	0.48	27.3	1/5/2020 3:30	1/6/2020 0:40	21.3	0.64	1.01	49,137
1/6/2020 0:40	1/6/2020 8:45	8.1	0.05	0.01	0.12	9.7	1/6/2020 0:40	1/6/2020 18:55	18.3	0.54	0.55	35,325
1/6/2020 19:00	1/7/2020 9:10	14.2	0.35	0.02	0.12	28	1/6/2020 18:55	1/7/2020 15:40	20.8	0.70	0.87	52,704
1/7/2020 15:45	1/8/2020 1:50	10.1	0.15	0.01	0.12	9.8	1/7/2020 15:40	1/8/2020 3:55	12.3	0.67	0.80	29,763
1/8/2020 4:00	1/8/2020 5:25	1.4	0.03	0.02	0.12	7.9	1/8/2020 3:55	1/8/2020 17:25	13.6	0.57	0.61	27,741
1/8/2020 18:20	1/8/2020 19:20	1.0	0.04	0.04	0.12	16.5	1/8/2020 18:20	1/9/2020 7:15	13.0	0.52	0.55	24,300

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)
1/9/2020 11:20	1/9/2020 12:05	0.8	0.10	0.13	0.24	17	1/9/2020 11:15	1/10/2020 0:00	12.8	0.51	0.55	23,700
1/10/2020 9:30	1/11/2020 23:55	38.4	1.42	0.04	0.36	21.8	1/10/2020 9:30	1/12/2020 6:15	44.8	1.05	2.42	169,996
1/12/2020 6:15	1/12/2020 17:50	11.6	0.05	0.00	0.12	7.8	1/12/2020 6:15	1/13/2020 5:50	23.7	1.12	1.33	95,292
1/16/2020 10:55	1/16/2020 16:35	5.7	0.44	0.08	0.36	108.4	1/16/2020 10:50	1/17/2020 4:35	17.8	0.59	0.61	37,812
1/17/2020 11:00	1/17/2020 18:30	7.5	0.29	0.04	0.24	19.8	1/17/2020 11:00	1/18/2020 1:05	14.2	0.55	0.55	27,990
1/18/2020 1:05	1/18/2020 16:10	15.1	0.95	0.06	0.24	8.9	1/18/2020 1:05	1/19/2020 4:05	27.1	0.91	1.25	89,118
1/21/2020 3:45	1/21/2020 22:30	18.8	0.74	0.04	0.24	60.4	1/21/2020 3:40	1/22/2020 8:35	29.0	0.97	1.51	101,520
1/22/2020 8:35	1/25/2020 15:20	78.8	1.75	0.02	0.24	11.2	1/22/2020 8:35	1/26/2020 1:15	88.8	1.29	2.04	412,424
1/26/2020 1:15	1/26/2020 11:30	10.3	0.36	0.04	0.24	11.6	1/26/2020 1:15	1/26/2020 19:25	18.3	1.17	1.60	76,938
1/26/2020 19:30	1/26/2020 21:45	2.3	0.05	0.02	0.12	11.2	1/26/2020 19:25	1/27/2020 9:40	14.3	0.90	1.01	46,320
1/27/2020 17:30	1/28/2020 10:55	17.4	0.95	0.05	0.36	22	1/27/2020 17:25	1/28/2020 19:50	26.5	1.55	2.42	147,954
1/28/2020 19:55	1/28/2020 23:55	4.0	0.03	0.01	0.12	10.8	1/28/2020 19:50	1/29/2020 9:55	14.2	1.17	1.33	59,838
1/29/2020 9:55	1/29/2020 17:15	7.3	0.09	0.01	0.12	24.8	1/29/2020 9:55	1/30/2020 5:10	19.3	0.96	1.09	66,918
1/30/2020 17:05	2/2/2020 1:10	56.1	1.84	0.03	0.36	24.8	1/30/2020 17:00	2/2/2020 10:30	65.6	1.36	2.42	321,060
2/2/2020 10:35	2/2/2020 11:15	0.7	0.12	0.18	0.48	14.3	2/2/2020 10:30	2/2/2020 23:10	12.8	1.26	1.42	57,933
2/3/2020 1:55	2/3/2020 9:20	7.4	0.08	0.01	0.24	14.8	2/3/2020 1:55	2/3/2020 21:20	19.5	1.01	1.17	70,557
2/4/2020 12:30	2/7/2020 9:45	69.3	5.05	0.07	0.36	30.8	2/4/2020 12:30	2/7/2020 15:30	75.1	4.35	8.00	1,176,883
2/7/2020 15:30	2/7/2020 19:00	3.5	0.19	0.05	0.24	8	2/7/2020 15:30	2/8/2020 3:45	12.3	2.22	2.55	98,451
2/8/2020 3:50	2/8/2020 13:55	10.1	0.27	0.03	0.24	9.2	2/8/2020 3:45	2/9/2020 1:50	22.2	1.61	2.04	128,106
2/11/2020 19:20	2/11/2020 23:30	4.2	0.06	0.01	0.24	80.2	2/11/2020 19:15	2/12/2020 11:25	16.3	0.76	0.80	44,469
2/13/2020 9:35	2/13/2020 19:50	10.3	0.23	0.02	0.36	34.2	2/13/2020 9:30	2/14/2020 7:50	22.4	0.73	0.87	58,710
2/14/2020 21:15	2/15/2020 2:50	5.6	0.11	0.02	0.12	25.6	2/14/2020 21:10	2/15/2020 14:45	17.7	0.66	0.73	41,730
2/15/2020 17:50	2/16/2020 4:40	10.8	0.30	0.03	0.36	18.2	2/15/2020 17:45	2/16/2020 15:15	21.6	0.78	1.09	60,492
2/16/2020 15:15	2/16/2020 16:20	1.1	0.09	0.08	0.36	15.2	2/16/2020 15:15	2/17/2020 4:15	13.1	0.67	0.73	31,647
2/22/2020 23:00	2/22/2020 23:35	0.6	0.03	0.05	0.12	151	2/22/2020 23:00	2/23/2020 5:15	6.3	0.50	0.55	11,415
2/23/2020 5:20	2/23/2020 7:40	2.3	0.14	0.06	0.24	157.3	2/23/2020 5:15	2/23/2020 19:40	14.5	0.56	0.73	29,415
2/28/2020 17:00	2/29/2020 6:50	13.8	0.14	0.01	0.12	129.6	2/28/2020 17:00	2/29/2020 18:45	25.8	0.49	0.55	45,600
2/29/2020 22:05	3/1/2020 1:40	3.6	0.05	0.01	0.12	17.5	2/29/2020 22:05	3/1/2020 13:40	15.7	0.45	0.50	25,395
3/1/2020 18:45	3/3/2020 7:05	36.3	0.83	0.02	0.12	20.4	3/1/2020 18:40	3/3/2020 16:05	45.5	0.64	1.01	104,853
3/3/2020 16:10	3/3/2020 17:00	0.8	0.06	0.07	0.12	10.8	3/3/2020 16:05	3/4/2020 0:55	8.9	0.63	0.67	20,157
3/4/2020 0:55	3/4/2020 5:25	4.5	0.44	0.10	0.72	8.5	3/4/2020 0:55	3/4/2020 17:25	16.6	0.82	1.17	48,765
3/5/2020 20:45	3/6/2020 12:20	15.6	0.74	0.05	0.24	39.6	3/5/2020 20:45	3/7/2020 0:20	27.7	1.02	1.42	102,024
3/7/2020 12:00	3/7/2020 13:35	1.6	0.13	0.08	0.36	25.3	3/7/2020 11:55	3/7/2020 21:20	9.5	0.84	1.60	28,713
3/7/2020 21:20	3/8/2020 7:35	10.3	0.30	0.03	0.24	8.2	3/7/2020 21:20	3/8/2020 19:30	22.3	0.85	1.25	68,112
3/11/2020 4:05	3/11/2020 5:00	0.9	0.05	0.05	0.36	68.8	3/11/2020 4:05	3/11/2020 17:00	13.0	0.63	0.67	29,268
3/13/2020 5:35	3/13/2020 18:00	12.4	0.26	0.02	0.12	48.7	3/13/2020 5:35	3/14/2020 5:55	24.4	0.67	0.87	59,091
3/24/2020 19:10	3/25/2020 6:40	11.5	0.10	0.01	0.12	266.5	3/24/2020 19:05	3/25/2020 10:55	15.9	0.51	0.55	29,085
3/25/2020 10:55	3/25/2020 13:25	2.5	0.08	0.03	0.12	6.8	3/25/2020 10:55	3/26/2020 1:25	14.6	0.51	0.55	26,970
3/26/2020 12:05	3/26/2020 12:25	0.3	0.03	0.09	0.12	23	3/26/2020 12:00	3/26/2020 18:30	6.6	0.50	0.50	11,850
3/26/2020 18:30	3/26/2020 21:15	2.8	0.03	0.01	0.12	29.4	3/26/2020 18:30	3/27/2020 5:45	11.3	0.50	0.55	20,415
3/27/2020 5:45	3/27/2020 8:15	2.5	0.05	0.02	0.12	40.7	3/27/2020 5:45	3/27/2020 20:10	14.5	0.50	0.50	26,100
3/28/2020 2:00	3/28/2020 10:25	8.4	0.08	0.01	0.12	19.2	3/28/2020 2:00	3/28/2020 12:10	10.3	0.51	0.55	18,780
3/28/2020 12:10	3/29/2020 6:00	17.8	0.59	0.03	0.24	9.7	3/28/2020 12:10	3/29/2020 17:55	29.8	0.69	1.33	74,586
3/29/2020 20:05	3/30/2020 5:55	9.8	0.39	0.04	0.48	15.4	3/29/2020 20:05	3/30/2020 12:20	16.3	0.73	1.25	42,984

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)
3/30/2020 12:20	3/31/2020 0:30	12.2	0.54	0.04	0.48	7.5	3/30/2020 12:20	3/31/2020 5:10	16.9	0.73	0.94	44,598
3/31/2020 5:10	3/31/2020 7:30	2.3	0.04	0.02	0.12	7.2	3/31/2020 5:10	3/31/2020 15:20	10.3	0.58	0.61	21,249
3/31/2020 15:20	3/31/2020 19:50	4.5	0.15	0.03	0.24	10.2	3/31/2020 15:20	4/1/2020 7:50	16.6	0.55	0.61	32,592
4/1/2020 11:20	4/1/2020 13:05	1.8	0.05	0.03	0.12	17.2	4/1/2020 11:15	4/2/2020 1:05	13.9	0.51	0.55	25,530
4/3/2020 14:45	4/3/2020 21:55	7.2	0.24	0.03	0.24	51.3	4/3/2020 14:45	4/4/2020 9:55	19.3	0.48	0.55	33,465
4/18/2020 7:50	4/18/2020 10:40	2.8	0.04	0.01	0.12	346.4	4/18/2020 7:50	4/18/2020 22:40	14.9	0.37	0.41	20,013
4/22/2020 5:45	4/23/2020 10:50	29.1	1.19	0.04	0.24	93.9	4/22/2020 5:45	4/23/2020 16:25	34.8	0.65	1.33	81,447
4/23/2020 16:30	4/23/2020 21:25	4.9	0.16	0.03	0.24	7.9	4/23/2020 16:25	4/24/2020 9:25	17.1	0.56	0.80	34,629
4/25/2020 6:25	4/25/2020 11:00	4.6	0.31	0.07	0.36	33.4	4/25/2020 6:20	4/25/2020 23:00	16.8	0.58	1.17	34,911
4/26/2020 22:10	4/27/2020 1:45	3.6	0.10	0.03	0.12	36.8	4/26/2020 22:10	4/27/2020 13:40	15.6	0.42	0.45	23,313
4/29/2020 19:05	4/29/2020 19:50	0.8	0.06	0.08	0.24	65.8	4/29/2020 19:05	4/30/2020 7:50	12.8	0.37	0.41	17,262
5/2/2020 3:30	5/2/2020 18:40	15.2	0.48	0.03	0.48	56.3	5/2/2020 3:30	5/3/2020 6:40	27.3	0.48	1.09	46,710
5/5/2020 19:50	5/6/2020 16:55	21.1	0.47	0.02	0.60	77.2	5/5/2020 19:50	5/7/2020 4:50	33.1	0.45	0.67	53,169
5/11/2020 18:05	5/11/2020 23:50	5.8	0.16	0.03	0.48	121.3	5/11/2020 18:00	5/12/2020 11:50	17.9	0.33	0.33	21,081
5/13/2020 2:45	5/13/2020 6:55	4.2	0.07	0.02	0.12	30.1	5/13/2020 2:45	5/13/2020 18:55	16.3	0.32	0.33	18,573
5/14/2020 5:20	5/14/2020 9:50	4.5	0.13	0.03	0.24	23.6	5/14/2020 5:15	5/14/2020 21:50	16.7	0.34	0.41	20,616
5/16/2020 12:50	5/17/2020 6:45	17.9	0.64	0.04	0.36	53.2	5/16/2020 12:45	5/17/2020 18:40	30.0	0.50	1.25	54,381
5/20/2020 16:30	5/21/2020 10:45	18.3	0.78	0.04	0.36	86.8	5/20/2020 16:25	5/21/2020 14:25	22.1	0.73	2.04	57,642
5/21/2020 14:25	5/21/2020 17:30	3.1	0.29	0.09	0.36	8.2	5/21/2020 14:25	5/22/2020 5:25	15.1	0.59	1.01	31,857
5/22/2020 16:10	5/23/2020 3:40	11.5	0.20	0.02	0.24	22.9	5/22/2020 16:05	5/23/2020 15:40	23.7	0.44	0.55	37,803
5/25/2020 4:40	5/25/2020 18:50	14.2	0.34	0.02	0.12	50.6	5/25/2020 4:40	5/26/2020 6:45	26.2	0.45	0.55	42,051
5/30/2020 7:55	5/31/2020 11:05	27.2	1.45	0.05	0.84	110.6	5/30/2020 7:50	5/31/2020 23:00	39.3	0.77	2.16	108,285
6/6/2020 14:05	6/6/2020 14:10	0.1	0.05	0.60	0.48	147.6	6/6/2020 14:00	6/6/2020 22:40	8.8	0.32	0.33	10,191
6/6/2020 22:45	6/7/2020 12:30	13.8	0.68	0.05	0.84	8.6	6/6/2020 22:40	6/7/2020 18:50	20.3	0.58	1.17	42,042
6/7/2020 18:50	6/8/2020 3:45	8.9	0.11	0.01	0.24	8.7	6/7/2020 18:50	6/8/2020 15:40	20.9	0.57	1.51	42,576
6/9/2020 0:35	6/9/2020 20:35	20.0	0.41	0.02	0.12	26	6/9/2020 0:30	6/10/2020 8:35	32.2	0.46	0.61	53,046
6/11/2020 7:20	6/11/2020 13:30	6.2	0.21	0.03	0.12	36.2	6/11/2020 7:15	6/12/2020 1:25	18.3	0.44	0.61	28,755
6/12/2020 12:30	6/12/2020 15:05	2.6	0.18	0.07	0.24	24.7	6/12/2020 12:30	6/12/2020 21:55	9.5	0.51	0.67	17,367
6/12/2020 21:55	6/13/2020 0:25	2.5	0.07	0.03	0.24	7.3	6/12/2020 21:55	6/13/2020 12:20	14.5	0.46	0.55	23,769
6/13/2020 20:55	6/14/2020 0:05	3.2	0.33	0.10	0.60	20.9	6/13/2020 20:55	6/14/2020 12:00	15.2	0.56	0.94	30,495
6/15/2020 4:45	6/15/2020 14:35	9.8	0.19	0.02	0.24	28.8	6/15/2020 4:45	6/16/2020 2:35	21.9	0.44	0.50	34,329
6/16/2020 3:50	6/16/2020 8:30	4.7	0.07	0.02	0.24	17.8	6/16/2020 3:45	6/16/2020 20:25	16.8	0.40	0.41	24,171
6/20/2020 5:20	6/20/2020 8:25	3.1	0.03	0.01	0.12	96.8	6/20/2020 5:15	6/20/2020 20:25	15.3	0.34	0.37	18,633
6/21/2020 5:30	6/21/2020 6:20	0.8	0.08	0.10	0.24	120.9	6/21/2020 5:25	6/21/2020 18:20	13.0	0.35	0.41	16,608
6/27/2020 12:00	6/28/2020 7:15	19.3	0.38	0.02	0.12	149.8	6/27/2020 12:00	6/28/2020 19:15	31.3	0.44	0.73	50,142
7/1/2020 15:00	7/1/2020 16:55	1.9	0.03	0.02	0.12	82.1	7/1/2020 14:55	7/2/2020 4:50	14.0	0.33	0.37	16,644
7/7/2020 11:40	7/7/2020 13:20	1.7	0.03	0.02	0.12	222.8	7/7/2020 11:35	7/8/2020 1:15	13.8	0.30	0.33	14,871
7/12/2020 4:10	7/12/2020 9:50	5.7	0.12	0.02	0.12	335.2	7/12/2020 4:10	7/12/2020 21:45	17.7	0.33	0.37	20,772
7/24/2020 0:45	7/24/2020 2:10	1.4	0.04	0.03	0.12	281.4	7/24/2020 0:40	7/24/2020 14:10	13.6	0.29	0.33	14,217
8/6/2020 7:00	8/6/2020 17:20	10.3	0.57	0.06	0.72	318.2	8/6/2020 6:55	8/7/2020 5:15	22.4	0.44	1.17	35,478
8/8/2020 4:50	8/8/2020 10:15	5.4	0.16	0.03	0.24	42.6	8/8/2020 4:50	8/8/2020 22:15	17.5	0.35	0.41	22,230
8/20/2020 20:00	8/20/2020 23:45	3.8	0.09	0.02	0.24	299.2	8/20/2020 20:00	8/21/2020 6:55	11.0	0.29	0.33	11,664
8/21/2020 7:00	8/21/2020 12:55	5.9	0.05	0.01	0.12	7.6	8/21/2020 6:55	8/21/2020 17:00	10.2	0.29	0.33	10,734

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)
10/3/2019 1:35	10/3/2019 4:45	3.2	0.03	0.01	0.12	96.3	10/3/2019 1:30	10/3/2019 14:30	13.1	0.15	0.18	7,173
10/3/2019 14:30	10/3/2019 17:30	3.0	0.05	0.02	0.12	109.2	10/3/2019 14:30	10/4/2019 2:10	11.8	0.21	0.74	8,817
10/4/2019 2:15	10/4/2019 4:05	1.8	0.05	0.03	0.12	9.0	10/4/2019 2:10	10/4/2019 16:05	14.0	0.21	0.27	10,512
10/7/2019 19:10	10/8/2019 16:00	20.8	0.39	0.02	0.24	88.8	10/7/2019 19:10	10/9/2019 4:00	32.9	0.42	1.29	49,992
10/16/2019 5:05	10/16/2019 9:40	4.6	0.17	0.04	0.24	186.4	10/16/2019 5:00	10/16/2019 15:40	10.8	0.39	0.95	15,231
10/16/2019 15:40	10/16/2019 20:15	4.6	0.30	0.07	0.48	6.8	10/16/2019 15:40	10/17/2019 4:15	12.7	0.55	3.12	25,155
10/17/2019 4:15	10/17/2019 17:00	12.8	0.13	0.01	0.24	8.5	10/17/2019 4:15	10/18/2019 5:00	24.8	0.26	1.03	23,448
10/18/2019 6:00	10/18/2019 6:15	0.3	0.03	0.12	0.12	16.2	10/18/2019 6:00	10/18/2019 14:40	8.8	0.19	0.20	5,976
10/18/2019 14:40	10/19/2019 14:20	23.7	1.03	0.04	0.48	24.8	10/18/2019 14:40	10/20/2019 2:15	35.7	0.85	3.30	109,227
10/20/2019 7:15	10/21/2019 3:50	20.6	0.56	0.03	0.84	20.2	10/20/2019 7:15	10/21/2019 7:40	24.5	0.63	3.67	55,230
10/21/2019 7:45	10/22/2019 7:50	24.1	1.00	0.04	0.24	9.7	10/21/2019 7:40	10/22/2019 19:50	36.3	0.89	2.64	116,763
10/25/2019 9:40	10/25/2019 19:15	9.6	0.28	0.03	0.36	76.6	10/25/2019 9:40	10/26/2019 7:15	21.7	0.37	1.20	28,761
11/9/2019 0:40	11/9/2019 15:35	14.9	0.24	0.02	0.12	341.6	11/9/2019 0:40	11/10/2019 3:30	26.9	0.24	0.81	23,148
11/12/2019 3:55	11/12/2019 7:50	3.9	0.29	0.07	0.24	60.8	11/12/2019 3:55	11/12/2019 19:50	16.0	0.46	1.49	26,553
11/15/2019 3:35	11/15/2019 6:10	2.6	0.20	0.08	0.24	68.5	11/15/2019 3:30	11/15/2019 18:10	14.8	0.40	1.60	21,135
11/16/2019 14:35	11/16/2019 18:15	3.7	0.08	0.02	0.12	33.6	11/16/2019 14:35	11/16/2019 23:25	8.9	0.34	0.74	10,950
11/16/2019 23:30	11/17/2019 20:50	21.3	0.38	0.02	0.24	6.7	11/16/2019 23:25	11/18/2019 8:45	33.4	0.47	1.49	56,598
11/18/2019 11:40	11/19/2019 10:00	22.3	0.88	0.04	0.60	16.8	11/18/2019 11:35	11/19/2019 21:55	34.4	1.01	6.78	125,457
11/24/2019 0:15	11/24/2019 2:30	2.3	0.11	0.05	0.12	113.2	11/24/2019 0:10	11/24/2019 14:25	14.3	0.23	0.66	11,784
11/25/2019 0:25	11/25/2019 9:10	8.8	0.06	0.01	0.12	22.9	11/25/2019 0:20	11/25/2019 15:20	15.1	0.17	0.20	9,120
11/25/2019 15:25	11/25/2019 21:10	5.8	0.03	0.01	0.12	10.2	11/25/2019 15:20	11/26/2019 9:10	17.9	0.15	0.24	9,978
12/1/2019 11:25	12/1/2019 13:20	1.9	0.03	0.02	0.12	150.2	12/1/2019 11:25	12/2/2019 1:15	13.9	0.13	0.15	6,705
12/4/2019 6:05	12/4/2019 7:45	1.7	0.03	0.02	0.12	216.8	12/4/2019 6:00	12/4/2019 19:40	13.8	0.13	0.15	6,597
12/7/2019 0:00	12/7/2019 13:35	13.6	0.39	0.03	0.24	282.8	12/6/2019 23:55	12/8/2019 1:30	25.7	0.35	1.29	32,544
12/10/2019 11:30	12/10/2019 23:00	11.5	0.20	0.02	0.12	74.3	12/10/2019 11:25	12/11/2019 9:40	22.3	0.24	0.59	19,023
12/11/2019 9:45	12/12/2019 14:35	28.8	0.54	0.02	0.24	15.2	12/11/2019 9:40	12/13/2019 2:35	41.0	0.42	1.39	61,902
12/13/2019 17:45	12/13/2019 22:35	4.8	0.06	0.01	0.24	27.4	12/13/2019 17:45	12/14/2019 4:15	10.6	0.22	0.31	8,433
12/14/2019 4:20	12/14/2019 13:35	9.3	0.17	0.02	0.24	10.5	12/14/2019 4:15	12/14/2019 23:35	19.4	0.36	0.95	25,143
12/14/2019 23:40	12/15/2019 12:50	13.2	0.17	0.01	0.24	11.7	12/14/2019 23:35	12/16/2019 0:45	25.3	0.37	1.03	33,558
12/18/2019 18:10	12/19/2019 2:40	8.5	0.36	0.04	0.12	83.8	12/18/2019 18:10	12/19/2019 11:55	17.8	0.54	1.29	34,506
12/19/2019 11:55	12/21/2019 15:10	51.3	5.04	0.10	1.44	10.8	12/19/2019 11:55	12/22/2019 3:10	63.3	5.48	20.55	1,249,923
12/22/2019 16:55	12/23/2019 8:15	15.3	0.40	0.03	0.12	28.3	12/22/2019 16:55	12/23/2019 20:10	27.3	1.35	2.34	133,284
12/26/2019 21:40	12/27/2019 0:35	2.9	0.03	0.01	0.12	89.7	12/26/2019 21:40	12/27/2019 12:30	14.9	0.50	0.59	27,102
12/30/2019 4:40	12/30/2019 7:40	3.0	0.06	0.02	0.12	168.7	12/30/2019 4:40	12/30/2019 19:40	15.1	0.40	0.52	21,786
12/31/2019 11:40	12/31/2019 15:25	3.8	0.09	0.02	0.24	29.9	12/31/2019 11:35	1/1/2020 2:25	13.9	0.50	1.39	24,999
1/1/2020 2:25	1/1/2020 8:15	5.8	0.18	0.03	0.60	11.2	1/1/2020 2:25	1/1/2020 19:55	17.6	0.56	2.34	35,175
1/1/2020 19:55	1/2/2020 3:50	7.9	0.65	0.08	0.36	12.2	1/1/2020 19:55	1/2/2020 11:00	15.2	1.84	4.71	100,449
1/2/2020 11:00	1/2/2020 20:05	9.1	0.12	0.01	0.12	8.4	1/2/2020 11:00	1/3/2020 8:05	21.2	0.91	1.20	69,090
1/3/2020 19:55	1/4/2020 1:45	5.8	0.34	0.06	0.24	28.4	1/3/2020 19:50	1/4/2020 13:45	18.0	1.12	2.64	72,429
1/4/2020 15:25	1/4/2020 16:25	1.0	0.04	0.04	0.24	15.3	1/4/2020 15:20	1/5/2020 3:25	12.2	0.73	0.95	31,815
1/5/2020 3:25	1/5/2020 11:35	8.2	0.20	0.02	0.24	12.0	1/5/2020 3:25	1/5/2020 23:35	20.3	0.81	1.82	59,295
1/6/2020 2:25	1/6/2020 7:05	4.7	0.03	0.01	0.12	15.3	1/6/2020 2:25	1/6/2020 14:10	11.8	0.66	0.66	28,053
1/6/2020 14:10	1/7/2020 9:00	18.8	0.42	0.02	0.12	27.1	1/6/2020 14:10	1/7/2020 15:45	25.7	0.98	1.71	90,225

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)
1/7/2020 15:50	1/7/2020 20:45	4.9	0.13	0.03	0.36	10.3	1/7/2020 15:45	1/8/2020 8:45	17.1	0.81	2.34	49,536
1/9/2020 6:15	1/9/2020 10:45	4.5	0.09	0.02	0.12	34.4	1/9/2020 6:10	1/9/2020 22:40	16.6	0.53	0.74	31,587
1/10/2020 2:40	1/10/2020 23:30	20.8	0.46	0.02	0.12	18.4	1/10/2020 2:35	1/11/2020 3:45	25.3	0.89	1.49	80,817
1/11/2020 3:50	1/11/2020 13:25	9.6	0.68	0.07	0.96	7.6	1/11/2020 3:45	1/11/2020 19:25	15.8	2.35	10.52	133,080
1/11/2020 19:30	1/12/2020 4:15	8.8	0.12	0.01	0.12	7.2	1/11/2020 19:25	1/12/2020 6:20	11.0	1.31	1.94	51,903
1/12/2020 6:20	1/12/2020 14:45	8.4	0.12	0.01	0.12	7.3	1/12/2020 6:20	1/13/2020 2:45	20.5	1.03	2.34	76,020
1/15/2020 12:10	1/16/2020 12:10	24.0	0.50	0.02	0.24	69.9	1/15/2020 12:10	1/17/2020 0:10	36.1	0.53	0.66	69,159
1/18/2020 0:45	1/18/2020 8:45	8.0	0.49	0.06	0.24	37.1	1/18/2020 0:40	1/18/2020 20:45	20.2	1.10	3.30	80,163
1/19/2020 11:20	1/19/2020 12:25	1.1	0.03	0.03	0.12	28.3	1/19/2020 11:15	1/20/2020 0:25	13.3	0.52	0.88	24,732
1/21/2020 3:20	1/21/2020 22:25	19.1	0.77	0.04	0.36	68.3	1/21/2020 3:20	1/22/2020 8:20	29.1	1.11	4.49	116,718
1/22/2020 8:20	1/23/2020 0:55	16.6	0.30	0.02	0.12	10.4	1/22/2020 8:20	1/23/2020 5:45	21.5	1.11	1.82	86,163
1/23/2020 5:45	1/25/2020 10:50	53.1	1.41	0.03	1.20	15.7	1/23/2020 5:45	1/25/2020 13:50	56.2	1.73	6.21	349,029
1/25/2020 13:50	1/25/2020 15:10	1.3	0.03	0.02	0.12	8.2	1/25/2020 13:50	1/26/2020 1:15	11.5	0.87	1.03	36,021
1/26/2020 1:20	1/26/2020 11:15	9.9	0.32	0.03	0.24	14.5	1/26/2020 1:15	1/26/2020 20:15	19.1	1.11	2.64	76,077
1/26/2020 20:20	1/27/2020 1:30	5.2	0.05	0.01	0.12	9.3	1/26/2020 20:15	1/27/2020 13:25	17.3	0.67	0.95	41,757
1/27/2020 17:05	1/28/2020 9:30	16.4	1.08	0.07	0.36	20.8	1/27/2020 17:05	1/28/2020 19:15	26.3	1.89	5.68	178,989
1/28/2020 19:20	1/28/2020 20:50	1.5	0.04	0.03	0.12	11.5	1/28/2020 19:15	1/29/2020 7:05	11.9	1.01	1.29	43,116
1/29/2020 7:05	1/29/2020 12:10	5.1	0.11	0.02	0.12	11.8	1/29/2020 7:05	1/30/2020 0:10	17.2	0.87	1.39	53,931
1/30/2020 18:00	1/30/2020 23:00	5.0	0.15	0.03	0.12	30.8	1/30/2020 17:55	1/31/2020 4:25	10.6	0.74	1.03	28,158
1/31/2020 4:30	2/1/2020 7:50	27.3	1.10	0.04	0.36	7.0	1/31/2020 4:25	2/1/2020 14:55	34.6	1.35	4.49	168,084
2/1/2020 15:00	2/2/2020 2:05	11.1	0.15	0.01	0.12	7.8	2/1/2020 14:55	2/2/2020 14:00	23.2	1.01	1.60	84,321
2/3/2020 0:40	2/3/2020 4:10	3.5	0.09	0.03	0.12	23.3	2/3/2020 0:40	2/3/2020 16:10	15.6	0.68	0.95	38,034
2/4/2020 11:50	2/7/2020 9:35	69.8	4.61	0.07	0.24	33.8	2/4/2020 11:50	2/7/2020 15:10	75.4	4.28	10.52	1,162,900
2/7/2020 15:15	2/8/2020 13:55	22.7	0.63	0.03	0.84	8.9	2/7/2020 15:10	2/9/2020 1:50	34.8	1.86	4.49	232,074
2/11/2020 23:25	2/11/2020 23:45	0.3	0.10	0.30	0.60	84.0	2/11/2020 23:25	2/12/2020 11:45	12.4	0.70	1.60	31,104
2/13/2020 9:15	2/13/2020 9:55	0.7	0.03	0.05	0.12	33.7	2/13/2020 9:10	2/13/2020 16:15	7.2	0.53	0.59	13,710
2/13/2020 16:15	2/13/2020 19:20	3.1	0.23	0.07	0.72	40.7	2/13/2020 16:15	2/14/2020 7:15	15.1	0.76	1.94	41,415
2/14/2020 20:35	2/15/2020 2:35	6.0	0.13	0.02	0.12	25.7	2/14/2020 20:35	2/15/2020 14:35	18.1	0.58	1.20	37,938
2/15/2020 14:35	2/16/2020 0:25	9.8	0.40	0.04	0.36	15.0	2/15/2020 14:35	2/16/2020 12:25	21.9	0.91	3.67	71,913
2/23/2020 4:40	2/23/2020 7:35	2.9	0.17	0.06	0.36	173.0	2/23/2020 4:40	2/23/2020 19:30	14.9	0.49	1.94	26,553
2/25/2020 19:25	2/25/2020 20:20	0.9	0.03	0.03	0.12	60.1	2/25/2020 19:25	2/26/2020 3:55	8.6	0.32	0.36	9,999
2/26/2020 3:55	2/26/2020 6:15	2.3	0.03	0.01	0.12	68.6	2/26/2020 3:55	2/26/2020 18:10	14.3	0.33	0.36	16,809
2/28/2020 16:55	2/28/2020 23:45	6.8	0.10	0.01	0.12	129.6	2/28/2020 16:55	2/29/2020 11:45	18.9	0.37	1.20	25,449
3/1/2020 0:25	3/1/2020 5:05	4.7	0.06	0.01	0.12	30.5	3/1/2020 0:20	3/1/2020 17:00	16.8	0.33	0.59	19,911
3/1/2020 18:15	3/1/2020 21:15	3.0	0.03	0.01	0.12	13.5	3/1/2020 18:15	3/2/2020 4:50	10.7	0.31	0.31	11,904
3/2/2020 4:55	3/2/2020 15:50	10.9	0.26	0.02	0.12	24.2	3/2/2020 4:50	3/3/2020 1:25	20.7	0.52	1.11	38,874
3/3/2020 1:25	3/3/2020 8:40	7.3	0.09	0.01	0.12	10.2	3/3/2020 1:25	3/3/2020 20:35	19.3	0.42	0.52	29,424
3/5/2020 19:55	3/6/2020 12:55	17.0	0.77	0.05	0.12	62.8	3/5/2020 19:50	3/7/2020 0:55	29.2	1.02	1.82	107,193
3/7/2020 12:20	3/7/2020 14:20	2.0	0.05	0.03	0.12	25.4	3/7/2020 12:20	3/7/2020 21:55	9.7	0.47	0.74	16,272
3/7/2020 22:00	3/7/2020 23:55	1.9	0.18	0.09	0.36	9.6	3/7/2020 21:55	3/8/2020 6:00	8.2	0.69	1.60	20,301
3/8/2020 6:05	3/8/2020 6:40	0.6	0.03	0.05	0.12	6.8	3/8/2020 6:00	3/8/2020 18:40	12.8	0.43	0.52	19,548
3/11/2020 4:25	3/11/2020 5:15	0.8	0.06	0.07	0.12	77.1	3/11/2020 4:25	3/11/2020 17:10	12.8	0.27	0.52	12,279
3/13/2020 5:45	3/13/2020 19:40	13.9	0.31	0.02	0.12	48.8	3/13/2020 5:45	3/14/2020 7:40	26.0	0.38	0.74	35,910
3/24/2020 14:45	3/24/2020 20:55	6.2	0.08	0.01	0.48	261.5	3/24/2020 14:45	3/24/2020 21:30	6.8	0.19	0.24	4,644

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)
3/24/2020 21:30	3/25/2020 13:30	16.0	0.14	0.01	0.12	6.7	3/24/2020 21:30	3/26/2020 1:25	28.0	0.20	0.27	20,343
3/27/2020 6:05	3/27/2020 12:35	6.5	0.04	0.01	0.12	43.0	3/27/2020 6:00	3/28/2020 0:30	18.6	0.19	0.20	12,378
3/28/2020 1:40	3/28/2020 6:05	4.4	0.06	0.01	0.12	62.6	3/28/2020 1:40	3/28/2020 15:55	14.3	0.20	0.27	10,569
3/28/2020 16:00	3/29/2020 8:50	16.8	0.66	0.04	0.24	12.6	3/28/2020 15:55	3/29/2020 20:45	28.9	0.67	2.64	69,474
3/30/2020 1:10	3/30/2020 5:05	3.9	0.36	0.09	0.60	20.5	3/30/2020 1:05	3/30/2020 12:00	11.0	0.82	2.95	32,664
3/30/2020 12:05	3/31/2020 1:20	13.3	0.30	0.02	0.24	7.2	3/30/2020 12:00	3/31/2020 13:15	25.3	0.54	1.39	48,828
3/31/2020 17:35	3/31/2020 20:20	2.8	0.06	0.02	0.24	19.2	3/31/2020 17:35	4/1/2020 3:30	10.0	0.33	0.41	11,730
4/1/2020 3:35	4/1/2020 12:30	8.9	0.09	0.01	0.12	9.9	4/1/2020 3:30	4/2/2020 0:30	21.1	0.37	1.39	27,918
4/3/2020 15:10	4/3/2020 19:25	4.3	0.04	0.01	0.24	53.2	4/3/2020 15:10	4/4/2020 7:25	16.3	0.24	0.24	14,100

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)
10/3/2019 1:35	10/3/2019 4:45	3.2	0.03	0.01	0.12	96.3	10/3/2019 1:30	10/3/2019 14:30	13.1	0.05	0.05	2,325
10/3/2019 14:30	10/3/2019 17:30	3.0	0.05	0.02	0.12	109.2	10/3/2019 14:30	10/4/2019 2:10	11.8	0.06	0.10	2,556
10/4/2019 2:15	10/4/2019 4:05	1.8	0.05	0.03	0.12	9.0	10/4/2019 2:10	10/4/2019 16:05	14.0	0.06	0.08	3,168
10/7/2019 19:10	10/8/2019 16:00	20.8	0.39	0.02	0.24	88.8	10/7/2019 19:10	10/9/2019 4:00	32.9	0.12	0.30	13,983
10/16/2019 5:05	10/16/2019 9:40	4.6	0.17	0.04	0.24	186.4	10/16/2019 5:00	10/16/2019 15:40	10.8	0.19	0.34	7,533
10/16/2019 15:40	10/16/2019 20:15	4.6	0.30	0.07	0.48	6.8	10/16/2019 15:40	10/17/2019 4:15	12.7	0.19	0.74	8,646
10/17/2019 4:15	10/17/2019 17:00	12.8	0.13	0.01	0.24	8.5	10/17/2019 4:15	10/18/2019 5:00	24.8	0.14	0.34	12,936
10/18/2019 6:00	10/18/2019 6:15	0.3	0.03	0.12	0.12	16.2	10/18/2019 6:00	10/18/2019 14:40	8.8	0.13	0.15	4,107
10/18/2019 14:40	10/19/2019 14:20	23.7	1.03	0.04	0.48	24.8	10/18/2019 14:40	10/20/2019 2:15	35.7	0.29	0.87	36,921
10/20/2019 7:15	10/21/2019 3:50	20.6	0.56	0.03	0.84	20.2	10/20/2019 7:15	10/21/2019 7:40	24.5	0.24	0.80	21,561
10/21/2019 7:45	10/22/2019 7:50	24.1	1.00	0.04	0.24	9.7	10/21/2019 7:40	10/22/2019 19:50	36.3	0.32	0.80	42,279
10/25/2019 9:40	10/25/2019 19:15	9.6	0.28	0.03	0.36	76.6	10/25/2019 9:40	10/26/2019 7:15	21.7	0.11	0.34	8,811
11/9/2019 0:40	11/9/2019 15:35	14.9	0.24	0.02	0.12	341.6	11/9/2019 0:40	11/10/2019 3:30	26.9	0.07	0.22	6,696
11/12/2019 3:55	11/12/2019 7:50	3.9	0.29	0.07	0.24	60.8	11/12/2019 3:55	11/12/2019 19:50	16.0	0.11	0.34	6,621
11/15/2019 3:35	11/15/2019 6:10	2.6	0.20	0.08	0.24	68.5	11/15/2019 3:30	11/15/2019 18:10	14.8	0.10	0.39	5,151
11/16/2019 14:35	11/16/2019 18:15	3.7	0.08	0.02	0.12	33.6	11/16/2019 14:35	11/16/2019 23:25	8.9	0.08	0.15	2,409
11/16/2019 23:30	11/17/2019 20:50	21.3	0.38	0.02	0.24	6.7	11/16/2019 23:25	11/18/2019 8:45	33.4	0.12	0.39	14,334
11/18/2019 11:40	11/19/2019 10:00	22.3	0.88	0.04	0.60	16.8	11/18/2019 11:35	11/19/2019 21:55	34.4	0.32	1.61	39,609
11/24/2019 0:15	11/24/2019 2:30	2.3	0.11	0.05	0.12	113.2	11/24/2019 0:10	11/24/2019 14:25	14.3	0.08	0.18	4,113
11/25/2019 0:25	11/25/2019 9:10	8.8	0.06	0.01	0.12	22.9	11/25/2019 0:20	11/25/2019 15:20	15.1	0.06	0.07	3,378
11/25/2019 15:25	11/25/2019 21:10	5.8	0.03	0.01	0.12	10.2	11/25/2019 15:20	11/26/2019 9:10	17.9	0.06	0.07	3,885
12/1/2019 11:25	12/1/2019 13:20	1.9	0.03	0.02	0.12	150.2	12/1/2019 11:25	12/2/2019 1:15	13.9	0.05	0.06	2,667
12/4/2019 6:05	12/4/2019 7:45	1.7	0.03	0.02	0.12	216.8	12/4/2019 6:00	12/4/2019 19:40	13.8	0.05	0.06	2,532
12/7/2019 0:00	12/7/2019 13:35	13.6	0.39	0.03	0.24	282.8	12/6/2019 23:55	12/8/2019 1:30	25.7	0.11	0.34	10,206
12/10/2019 11:30	12/10/2019 23:00	11.5	0.20	0.02	0.12	74.3	12/10/2019 11:25	12/11/2019 9:40	22.3	0.08	0.16	6,687
12/11/2019 9:45	12/12/2019 14:35	28.8	0.54	0.02	0.24	15.2	12/11/2019 9:40	12/13/2019 2:35	41.0	0.14	0.49	20,688
12/13/2019 17:45	12/13/2019 22:35	4.8	0.06	0.01	0.24	27.4	12/13/2019 17:45	12/14/2019 4:15	10.6	0.09	0.12	3,243
12/14/2019 4:20	12/14/2019 13:35	9.3	0.17	0.02	0.24	10.5	12/14/2019 4:15	12/14/2019 23:35	19.4	0.13	0.30	8,736
12/14/2019 23:40	12/15/2019 12:50	13.2	0.17	0.01	0.24	11.7	12/14/2019 23:35	12/16/2019 0:45	25.3	0.15	0.49	13,311
12/18/2019 18:10	12/19/2019 2:40	8.5	0.36	0.04	0.12	83.8	12/18/2019 18:10	12/19/2019 11:55	17.8	0.18	0.39	11,670
12/19/2019 11:55	12/21/2019 15:10	51.3	5.04	0.10	1.44	10.8	12/19/2019 11:55	12/22/2019 3:10	63.3	0.88	2.06	201,147
12/22/2019 16:55	12/23/2019 8:15	15.3	0.40	0.03	0.12	28.3	12/22/2019 16:55	12/23/2019 20:10	27.3	0.30	0.62	29,658
12/26/2019 21:40	12/27/2019 0:35	2.9	0.03	0.01	0.12	89.7	12/26/2019 21:40	12/27/2019 12:30	14.9	0.09	0.11	4,572
12/30/2019 4:40	12/30/2019 7:40	3.0	0.06	0.02	0.12	168.7	12/30/2019 4:40	12/30/2019 19:40	15.1	0.06	0.08	3,111
12/31/2019 11:40	12/31/2019 15:25	3.8	0.09	0.02	0.24	29.9	12/31/2019 11:35	1/1/2020 2:25	14.0	0.08	0.24	3,780
1/1/2020 2:25	1/1/2020 8:15	5.8	0.18	0.03	0.60	11.2	1/1/2020 2:25	1/1/2020 19:55	17.6	0.08	0.44	5,355
1/1/2020 19:55	1/2/2020 3:50	7.9	0.65	0.08	0.36	12.2	1/1/2020 19:55	1/2/2020 11:00	15.2	0.34	0.94	18,417
1/2/2020 11:00	1/2/2020 20:05	9.1	0.12	0.01	0.12	8.4	1/2/2020 11:00	1/3/2020 8:05	21.2	0.16	0.22	12,108
1/3/2020 19:55	1/4/2020 1:45	5.8	0.34	0.06	0.24	28.4	1/3/2020 19:50	1/4/2020 13:45	18.0	0.19	0.55	12,549
1/4/2020 15:25	1/4/2020 16:25	1.0	0.04	0.04	0.24	15.3	1/4/2020 15:20	1/5/2020 3:25	12.2	0.13	0.16	5,598
1/5/2020 3:25	1/5/2020 11:35	8.2	0.20	0.02	0.24	12.0	1/5/2020 3:25	1/5/2020 23:35	20.3	0.14	0.34	10,311
1/6/2020 2:25	1/6/2020 7:05	4.7	0.03	0.01	0.12	15.3	1/6/2020 2:25	1/6/2020 14:10	11.8	0.12	0.12	5,010
1/6/2020 14:10	1/7/2020 9:00	18.8	0.42	0.02	0.12	27.1	1/6/2020 14:10	1/7/2020 15:45	25.7	0.16	0.28	15,204

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)
1/7/2020 15:50	1/7/2020 20:45	4.9	0.13	0.03	0.36	10.3	1/7/2020 15:45	1/8/2020 8:45	17.1	0.16	0.77	9,984
1/9/2020 6:15	1/9/2020 10:45	4.5	0.09	0.02	0.12	34.4	1/9/2020 6:10	1/9/2020 22:40	16.6	0.12	0.15	6,891
1/10/2020 2:40	1/10/2020 23:30	20.8	0.46	0.02	0.12	18.4	1/10/2020 2:35	1/11/2020 3:45	25.3	0.17	0.28	15,558
1/11/2020 3:50	1/11/2020 13:25	9.6	0.68	0.07	0.96	7.6	1/11/2020 3:45	1/11/2020 19:25	15.8	0.48	1.24	26,991
1/11/2020 19:30	1/12/2020 4:15	8.8	0.12	0.01	0.12	7.2	1/11/2020 19:25	1/12/2020 6:20	11.0	0.35	0.55	13,875
1/12/2020 6:20	1/12/2020 14:45	8.4	0.12	0.01	0.12	7.3	1/12/2020 6:20	1/13/2020 2:45	20.5	0.27	0.77	19,977
1/15/2020 12:10	1/16/2020 12:10	24.0	0.50	0.02	0.24	69.9	1/15/2020 12:10	1/17/2020 0:10	36.1	0.13	0.15	17,433
1/18/2020 0:45	1/18/2020 8:45	8.0	0.49	0.06	0.24	37.1	1/18/2020 0:40	1/18/2020 20:45	20.2	0.27	0.85	19,557
1/19/2020 11:20	1/19/2020 12:25	1.1	0.03	0.03	0.12	28.3	1/19/2020 11:15	1/20/2020 0:25	13.3	0.14	0.16	6,813
1/21/2020 3:20	1/21/2020 22:25	19.1	0.77	0.04	0.36	68.3	1/21/2020 3:20	1/22/2020 8:20	29.1	0.28	1.03	28,974
1/22/2020 8:20	1/23/2020 0:55	16.6	0.30	0.02	0.12	10.4	1/22/2020 8:20	1/23/2020 5:45	21.5	0.28	0.49	22,044
1/23/2020 5:45	1/25/2020 10:50	53.1	1.41	0.03	1.20	15.7	1/23/2020 5:45	1/25/2020 13:50	56.2	0.55	1.13	111,738
1/25/2020 13:50	1/25/2020 15:10	1.3	0.03	0.02	0.12	8.2	1/25/2020 13:50	1/26/2020 1:15	11.5	0.33	0.39	13,485
1/26/2020 1:20	1/26/2020 11:15	9.9	0.32	0.03	0.24	14.5	1/26/2020 1:15	1/26/2020 20:15	19.1	0.40	1.03	27,375
1/26/2020 20:20	1/27/2020 1:30	5.2	0.05	0.01	0.12	9.3	1/26/2020 20:15	1/27/2020 13:25	17.3	0.26	0.34	16,218
1/27/2020 17:05	1/28/2020 9:30	16.4	1.08	0.07	0.36	20.8	1/27/2020 17:05	1/28/2020 19:15	26.3	0.71	1.24	66,855
1/28/2020 19:20	1/28/2020 20:50	1.5	0.04	0.03	0.12	11.5	1/28/2020 19:15	1/29/2020 7:05	11.9	0.47	0.55	20,040
1/29/2020 7:05	1/29/2020 12:10	5.1	0.11	0.02	0.12	11.8	1/29/2020 7:05	1/30/2020 0:10	17.2	0.36	0.55	22,236
1/30/2020 18:00	1/30/2020 23:00	5.0	0.15	0.03	0.12	30.8	1/30/2020 17:55	1/31/2020 4:25	10.6	0.31	0.49	11,704
1/31/2020 4:30	2/1/2020 7:50	27.3	1.10	0.04	0.36	7.0	1/31/2020 4:25	2/1/2020 14:55	34.6	0.54	1.36	67,601
2/1/2020 15:00	2/2/2020 2:05	11.1	0.15	0.01	0.12	7.8	2/1/2020 14:55	2/2/2020 14:00	23.2	0.65	1.03	54,219
2/3/2020 0:40	2/3/2020 4:10	3.5	0.09	0.03	0.12	23.3	2/3/2020 0:40	2/3/2020 16:10	15.6	0.39	0.55	22,117
2/4/2020 11:50	2/7/2020 9:35	69.8	4.61	0.07	0.24	33.8	2/4/2020 11:50	2/7/2020 15:10	75.4	1.91	3.37	517,356
2/7/2020 15:15	2/8/2020 13:55	22.7	0.63	0.03	0.84	8.9	2/7/2020 15:10	2/9/2020 1:50	34.8	0.88	1.40	110,055
2/11/2020 23:25	2/11/2020 23:45	0.3	0.10	0.30	0.60	84.0	2/11/2020 23:25	2/12/2020 11:45	12.4	0.16	0.23	6,993
2/13/2020 9:15	2/13/2020 9:55	0.7	0.03	0.05	0.12	33.7	2/13/2020 9:10	2/13/2020 16:15	7.2	0.09	0.10	2,373
2/13/2020 16:15	2/13/2020 19:20	3.1	0.23	0.07	0.72	40.7	2/13/2020 16:15	2/14/2020 7:15	15.1	0.18	0.23	9,915
2/14/2020 20:35	2/15/2020 2:35	6.0	0.13	0.02	0.12	25.7	2/14/2020 20:35	2/15/2020 14:35	18.1	0.09	0.15	6,090
2/15/2020 14:35	2/16/2020 0:25	9.8	0.40	0.04	0.36	15.0	2/15/2020 14:35	2/16/2020 12:25	21.9	0.21	0.32	16,260
2/23/2020 4:40	2/23/2020 7:35	2.9	0.17	0.06	0.36	173.0	2/23/2020 4:40	2/23/2020 19:30	14.9	0.11	0.23	5,982
2/25/2020 19:25	2/25/2020 20:20	0.9	0.03	0.03	0.12	60.1	2/25/2020 19:25	2/26/2020 3:55	8.6	0.02	0.03	663
2/26/2020 3:55	2/26/2020 6:15	2.3	0.03	0.01	0.12	68.6	2/26/2020 3:55	2/26/2020 18:10	14.3	0.02	0.03	1,119
2/28/2020 16:55	2/28/2020 23:45	6.8	0.10	0.01	0.12	129.6	2/28/2020 16:55	2/29/2020 11:45	18.9	0.03	0.07	2,229
3/1/2020 0:25	3/1/2020 5:05	4.7	0.06	0.01	0.12	30.5	3/1/2020 0:20	3/1/2020 17:00	16.8	0.02	0.07	1,449
3/1/2020 18:15	3/1/2020 21:15	3.0	0.03	0.01	0.12	13.5	3/1/2020 18:15	3/2/2020 4:50	10.7	0.05	0.07	1,734
3/2/2020 4:55	3/2/2020 15:50	10.9	0.26	0.02	0.12	24.2	3/2/2020 4:50	3/3/2020 1:25	20.7	0.14	0.23	10,683
3/3/2020 1:25	3/3/2020 8:40	7.3	0.09	0.01	0.12	10.2	3/3/2020 1:25	3/3/2020 20:35	19.3	0.17	0.23	11,547
3/5/2020 19:55	3/6/2020 12:55	17.0	0.77	0.05	0.12	62.8	3/5/2020 19:50	3/7/2020 0:55	29.2	0.12	0.22	12,528
3/7/2020 12:20	3/7/2020 14:20	2.0	0.05	0.03	0.12	25.4	3/7/2020 12:20	3/7/2020 21:55	9.7	0.09	0.10	2,997
3/7/2020 22:00	3/7/2020 23:55	1.9	0.18	0.09	0.36	9.6	3/7/2020 21:55	3/8/2020 6:00	8.2	0.10	0.24	2,970
3/8/2020 6:05	3/8/2020 6:40	0.6	0.03	0.05	0.12	6.8	3/8/2020 6:00	3/8/2020 18:40	12.8	0.09	0.09	4,020
3/11/2020 4:25	3/11/2020 5:15	0.8	0.06	0.07	0.12	77.1	3/11/2020 4:25	3/11/2020 17:10	12.8	0.08	0.10	3,747
3/13/2020 5:45	3/13/2020 19:40	13.9	0.31	0.02	0.12	48.8	3/13/2020 5:45	3/14/2020 7:40	26.0	0.08	0.10	7,440
3/24/2020 14:45	3/24/2020 20:55	6.2	0.08	0.01	0.48	261.5	3/24/2020 14:45	3/24/2020 21:30	6.8	0.06	0.08	1,503

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)
3/24/2020 21:30	3/25/2020 13:30	16.0	0.14	0.01	0.12	6.7	3/24/2020 21:30	3/26/2020 1:25	28.0	0.07	0.08	6,696
3/27/2020 6:05	3/27/2020 12:35	6.5	0.04	0.01	0.12	43.0	3/27/2020 6:00	3/28/2020 0:30	18.6	0.07	0.07	4,674
3/28/2020 1:40	3/28/2020 6:05	4.4	0.06	0.01	0.12	62.6	3/28/2020 1:40	3/28/2020 15:55	14.3	0.07	0.08	3,705
3/28/2020 16:00	3/29/2020 8:50	16.8	0.66	0.04	0.24	12.6	3/28/2020 15:55	3/29/2020 20:45	28.9	0.20	1.03	20,808
3/30/2020 1:10	3/30/2020 5:05	3.9	0.36	0.09	0.60	20.5	3/30/2020 1:05	3/30/2020 12:00	11.0	0.25	1.13	10,080
3/30/2020 12:05	3/31/2020 1:20	13.3	0.30	0.02	0.24	7.2	3/30/2020 12:00	3/31/2020 13:15	25.3	0.16	0.44	14,925
3/31/2020 17:35	3/31/2020 20:20	2.8	0.06	0.02	0.24	19.2	3/31/2020 17:35	4/1/2020 3:30	10.0	0.12	0.13	4,431
4/1/2020 3:35	4/1/2020 12:30	8.9	0.09	0.01	0.12	9.9	4/1/2020 3:30	4/2/2020 0:30	21.1	0.14	0.62	10,935
4/3/2020 15:10	4/3/2020 19:25	4.3	0.04	0.01	0.24	53.2	4/3/2020 15:10	4/4/2020 7:25	16.3	0.11	0.11	6,468
4/11/2020 11:25	4/11/2020 12:05	0.7	0.04	0.06	0.12	188.2	4/11/2020 11:25	4/12/2020 0:05	12.8	0.09	0.11	4,242
4/18/2020 6:55	4/18/2020 10:25	3.5	0.05	0.01	0.12	163.5	4/18/2020 6:55	4/18/2020 22:25	15.6	0.09	0.11	5,316
4/22/2020 5:30	4/22/2020 21:25	15.9	0.60	0.04	0.24	92.1	4/22/2020 5:25	4/22/2020 22:05	16.8	0.16	0.39	9,456
4/22/2020 22:10	4/23/2020 3:35	5.4	0.38	0.07	0.24	6.7	4/22/2020 22:05	4/23/2020 15:30	17.5	0.16	0.44	10,212
4/23/2020 15:55	4/23/2020 23:20	7.4	0.16	0.02	0.36	12.9	4/23/2020 15:55	4/24/2020 11:15	19.4	0.09	0.12	6,336
4/25/2020 6:15	4/25/2020 11:05	4.8	0.44	0.09	0.48	33.2	4/25/2020 6:15	4/25/2020 23:00	16.8	0.19	1.13	11,592
4/26/2020 21:45	4/27/2020 3:20	5.6	0.12	0.02	0.12	35.8	4/26/2020 21:40	4/27/2020 15:20	17.8	0.12	0.22	7,494
4/29/2020 19:00	4/29/2020 19:40	0.7	0.04	0.06	0.24	65.5	4/29/2020 18:55	4/30/2020 7:40	12.8	0.10	0.11	4,656
5/2/2020 2:55	5/2/2020 15:25	12.5	0.49	0.04	0.24	55.9	5/2/2020 2:55	5/3/2020 3:20	24.5	0.15	0.77	12,810
5/5/2020 19:45	5/6/2020 13:10	17.4	0.28	0.02	0.60	76.9	5/5/2020 19:45	5/7/2020 1:05	29.4	0.10	0.39	10,194
5/11/2020 18:40	5/11/2020 23:45	5.1	0.05	0.01	0.12	125.7	5/11/2020 18:40	5/12/2020 11:45	17.2	0.08	0.08	4,944
5/13/2020 2:10	5/13/2020 6:15	4.1	0.04	0.01	0.12	29.8	5/13/2020 2:10	5/13/2020 18:10	16.1	0.08	0.08	4,413
5/14/2020 4:35	5/14/2020 8:05	3.5	0.10	0.03	0.24	26.4	5/14/2020 4:30	5/14/2020 20:00	15.6	0.09	0.18	5,196
5/16/2020 10:25	5/17/2020 7:05	20.7	0.65	0.03	0.36	51.2	5/16/2020 10:25	5/17/2020 19:05	32.8	0.19	1.48	22,896
5/20/2020 16:00	5/20/2020 18:25	2.4	0.05	0.02	0.12	86.6	5/20/2020 15:55	5/21/2020 1:50	10.0	0.09	0.09	3,084
5/21/2020 1:50	5/21/2020 21:20	19.5	0.71	0.04	0.24	9.3	5/21/2020 1:50	5/22/2020 9:20	31.6	0.19	1.13	21,522
5/22/2020 14:50	5/23/2020 4:10	13.3	0.57	0.04	0.60	22.0	5/22/2020 14:45	5/23/2020 16:10	25.5	0.13	0.34	11,871
5/25/2020 4:00	5/25/2020 13:10	9.2	0.22	0.02	0.12	48.6	5/25/2020 3:55	5/26/2020 1:10	21.3	0.08	0.11	6,438
5/30/2020 7:05	5/31/2020 10:45	27.7	1.45	0.05	0.48	115.8	5/30/2020 7:05	5/31/2020 22:40	39.7	0.50	1.75	71,094
6/5/2020 20:15	6/5/2020 20:30	0.3	0.16	0.64	0.96	133.0	6/5/2020 20:15	6/6/2020 8:25	12.3	0.09	0.26	3,864
6/7/2020 0:10	6/7/2020 10:15	10.1	0.64	0.06	0.36	27.8	6/7/2020 0:10	6/7/2020 20:45	20.7	0.20	0.77	14,523
6/7/2020 20:50	6/7/2020 20:55	0.1	0.03	0.36	0.24	10.8	6/7/2020 20:45	6/8/2020 8:55	12.3	0.10	0.13	4,521
6/9/2020 0:10	6/9/2020 12:00	11.8	0.26	0.02	0.12	38.2	6/9/2020 0:10	6/9/2020 18:40	18.6	0.10	0.16	6,735
6/9/2020 18:45	6/9/2020 20:10	1.4	0.06	0.04	0.12	8.8	6/9/2020 18:40	6/10/2020 8:10	13.6	0.09	0.11	4,395
6/11/2020 9:05	6/11/2020 11:55	2.8	0.22	0.08	0.24	38.1	6/11/2020 9:00	6/11/2020 23:55	15.0	0.12	0.44	6,723
6/12/2020 12:05	6/12/2020 15:05	3.0	0.28	0.09	0.24	25.1	6/12/2020 12:00	6/12/2020 21:10	9.3	0.18	0.62	6,111
6/12/2020 21:15	6/13/2020 1:25	4.2	0.11	0.03	0.24	6.8	6/12/2020 21:10	6/13/2020 13:25	16.3	0.14	0.69	8,307
6/13/2020 21:45	6/14/2020 0:25	2.7	0.04	0.02	0.12	23.9	6/13/2020 21:40	6/14/2020 12:25	14.8	0.10	0.10	5,340
6/15/2020 4:00	6/15/2020 14:20	10.3	0.14	0.01	0.12	30.2	6/15/2020 3:55	6/16/2020 2:15	22.4	0.09	0.12	7,167
6/16/2020 3:40	6/16/2020 13:15	9.6	0.08	0.01	0.12	18.1	6/16/2020 3:40	6/17/2020 1:15	21.7	0.08	0.11	6,243
6/27/2020 10:35	6/28/2020 5:40	19.1	0.68	0.04	0.36	264.8	6/27/2020 10:30	6/28/2020 17:40	31.3	0.08	0.48	9,072
6/30/2020 5:40	6/30/2020 9:30	3.8	0.03	0.01	0.12	51.2	6/30/2020 5:35	6/30/2020 21:30	16.0	0.03	0.04	1,851

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)
10/3/2019 1:40	10/3/2019 2:45	1.1	0.03	0.03	0.12	95.8	10/3/2019 1:40	10/3/2019 14:45	13.2	0.08	0.11	3,873
10/3/2019 17:25	10/3/2019 17:50	0.4	0.03	0.07	0.12	111.6	10/3/2019 17:25	10/4/2019 2:25	9.1	0.09	0.33	2,841
10/4/2019 2:30	10/4/2019 4:50	2.3	0.04	0.02	0.12	120.7	10/4/2019 2:25	10/4/2019 16:50	14.5	0.07	0.18	3,891
10/7/2019 18:45	10/8/2019 15:45	21.0	0.65	0.03	1.32	88.2	10/7/2019 18:40	10/9/2019 3:40	33.1	0.53	5.92	63,453
10/16/2019 5:15	10/16/2019 9:50	4.6	0.13	0.03	0.12	186.7	10/16/2019 5:10	10/16/2019 15:40	10.6	0.84	3.64	31,905
10/16/2019 15:40	10/16/2019 20:10	4.5	0.23	0.05	0.24	6.7	10/16/2019 15:40	10/17/2019 4:15	12.7	1.23	9.51	56,307
10/17/2019 4:20	10/17/2019 17:40	13.3	0.10	0.01	0.12	11.5	10/17/2019 4:15	10/18/2019 5:35	25.4	0.36	1.11	32,760
10/18/2019 15:10	10/19/2019 12:25	21.3	1.03	0.05	0.48	25.3	10/18/2019 15:10	10/20/2019 0:20	33.3	2.53	11.86	302,553
10/20/2019 7:05	10/21/2019 0:30	17.4	0.30	0.02	0.48	19.9	10/20/2019 7:05	10/21/2019 7:50	24.8	0.93	8.44	82,863
10/21/2019 7:50	10/22/2019 5:20	21.5	0.93	0.04	0.48	9.5	10/21/2019 7:50	10/22/2019 17:20	33.6	1.58	5.36	190,803
10/25/2019 9:40	10/25/2019 20:50	11.2	0.33	0.03	0.36	77.8	10/25/2019 9:40	10/26/2019 8:45	23.2	0.65	4.09	53,805
11/9/2019 0:40	11/9/2019 16:25	15.8	0.33	0.02	0.24	339.9	11/9/2019 0:40	11/10/2019 4:25	27.8	0.45	3.21	45,051
11/12/2019 3:55	11/12/2019 7:50	3.9	0.30	0.08	0.12	60.4	11/12/2019 3:55	11/12/2019 19:50	16.0	0.70	2.62	40,563
11/15/2019 3:40	11/15/2019 5:40	2.0	0.19	0.10	0.24	68.5	11/15/2019 3:40	11/15/2019 17:25	13.8	0.46	2.62	22,770
11/15/2019 17:25	11/15/2019 19:40	2.3	0.81	0.36	0.96	12.4	11/15/2019 17:25	11/16/2019 7:40	14.3	1.10	5.36	56,502
11/16/2019 14:35	11/16/2019 18:15	3.7	0.07	0.02	0.12	19.0	11/16/2019 14:35	11/16/2019 23:25	8.9	0.54	1.35	17,310
11/16/2019 23:25	11/17/2019 20:50	21.4	0.40	0.02	0.36	6.6	11/16/2019 23:25	11/18/2019 8:45	33.4	0.71	3.21	84,816
11/18/2019 11:50	11/19/2019 1:55	14.1	0.41	0.03	0.24	16.3	11/18/2019 11:50	11/19/2019 3:20	15.6	1.18	4.09	66,315
11/19/2019 3:25	11/19/2019 9:55	6.5	0.11	0.02	0.12	7.1	11/19/2019 3:20	11/19/2019 21:55	18.7	0.77	1.63	51,921
11/23/2019 23:00	11/24/2019 5:50	6.8	0.12	0.02	0.12	111.9	11/23/2019 23:00	11/24/2019 17:45	18.8	0.23	0.88	15,915
11/24/2019 21:25	11/25/2019 8:30	11.1	0.52	0.05	0.60	20.1	11/24/2019 21:20	11/25/2019 15:00	17.8	0.77	2.26	49,245
11/25/2019 15:05	11/26/2019 4:20	13.3	0.21	0.02	0.24	7.4	11/25/2019 15:00	11/26/2019 16:15	25.3	0.63	2.44	57,303
12/1/2019 11:25	12/1/2019 13:40	2.3	0.03	0.01	0.12	133.9	12/1/2019 11:25	12/2/2019 1:40	14.3	0.11	0.11	5,658
12/6/2019 20:20	12/7/2019 16:45	20.4	0.39	0.02	0.12	262.8	12/6/2019 20:15	12/8/2019 4:40	32.5	0.49	1.93	56,790
12/10/2019 11:30	12/10/2019 21:55	10.4	0.21	0.02	0.12	72.6	12/10/2019 11:25	12/11/2019 9:55	22.6	0.39	1.23	31,782
12/11/2019 9:55	12/12/2019 0:15	14.3	0.34	0.02	0.12	14.9	12/11/2019 9:55	12/12/2019 6:10	20.3	0.75	2.09	55,242
12/12/2019 6:10	12/12/2019 9:05	2.9	0.04	0.01	0.12	7.5	12/12/2019 6:10	12/12/2019 13:40	7.6	0.57	1.11	15,669
12/12/2019 13:45	12/12/2019 17:30	3.8	0.11	0.03	0.24	7.6	12/12/2019 13:40	12/13/2019 5:25	15.8	0.55	3.21	31,230
12/13/2019 23:55	12/14/2019 15:55	16.0	0.50	0.03	0.84	33.4	12/13/2019 23:55	12/14/2019 23:35	23.8	1.22	6.81	104,190
12/14/2019 23:35	12/15/2019 7:15	7.7	0.10	0.01	0.12	8.0	12/14/2019 23:35	12/15/2019 19:15	19.8	0.64	1.35	45,216
12/18/2019 18:00	12/19/2019 7:25	13.4	0.32	0.02	0.12	84.0	12/18/2019 17:55	12/19/2019 12:10	18.3	0.65	1.78	42,972
12/19/2019 12:10	12/21/2019 18:50	54.7	4.87	0.09	1.44	11.8	12/19/2019 12:10	12/22/2019 6:45	66.7	5.90	16.87	1,416,109
12/22/2019 16:55	12/23/2019 4:00	11.1	0.19	0.02	0.12	27.6	12/22/2019 16:55	12/23/2019 16:00	23.2	1.36	2.26	113,817
12/30/2019 4:45	12/30/2019 7:20	2.6	0.05	0.02	0.12	171.4	12/30/2019 4:40	12/30/2019 19:20	14.8	0.17	0.33	8,775
12/31/2019 8:10	12/31/2019 15:25	7.3	0.07	0.01	0.24	26.9	12/31/2019 8:10	1/1/2020 3:25	18.4	0.19	1.11	12,768
1/1/2020 7:10	1/1/2020 8:15	1.1	0.37	0.34	1.08	15.9	1/1/2020 7:05	1/1/2020 19:25	12.4	1.02	6.21	45,741
1/1/2020 19:30	1/2/2020 7:30	12.0	0.50	0.04	0.48	11.9	1/1/2020 19:25	1/2/2020 11:55	16.6	1.64	4.33	98,037
1/2/2020 11:55	1/2/2020 19:40	7.8	0.11	0.01	0.12	10.9	1/2/2020 11:55	1/3/2020 7:40	19.8	0.77	1.23	55,311
1/3/2020 20:15	1/4/2020 1:05	4.8	0.30	0.06	0.12	28.3	1/3/2020 20:10	1/4/2020 13:05	17.0	0.98	3.01	60,207
1/4/2020 15:30	1/4/2020 16:50	1.3	0.03	0.02	0.12	15.4	1/4/2020 15:30	1/5/2020 3:30	12.1	0.41	0.60	18,000
1/5/2020 3:30	1/5/2020 15:15	11.8	0.30	0.03	0.24	27.4	1/5/2020 3:30	1/6/2020 2:20	22.9	0.71	3.21	58,683
1/6/2020 2:20	1/6/2020 8:00	5.7	0.03	0.01	0.12	11.5	1/6/2020 2:20	1/6/2020 13:30	11.3	0.45	0.53	18,063
1/6/2020 13:35	1/7/2020 9:00	19.4	0.33	0.02	0.12	22.8	1/6/2020 13:30	1/7/2020 15:40	26.3	0.85	1.93	80,703

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)
1/7/2020 15:40	1/7/2020 21:05	5.4	0.08	0.01	0.12	10.2	1/7/2020 15:40	1/8/2020 9:00	17.4	0.66	1.63	41,577
1/8/2020 18:15	1/8/2020 21:55	3.7	0.04	0.01	0.12	24.9	1/8/2020 18:10	1/9/2020 6:55	12.8	0.36	0.60	16,785
1/9/2020 7:00	1/9/2020 10:10	3.2	0.08	0.03	0.12	12.8	1/9/2020 6:55	1/9/2020 22:05	15.3	0.43	0.88	23,337
1/10/2020 3:00	1/10/2020 21:50	18.8	0.42	0.02	0.12	18.4	1/10/2020 2:55	1/11/2020 4:40	25.8	0.87	1.93	80,787
1/11/2020 4:40	1/12/2020 1:50	21.2	0.73	0.03	0.36	9.2	1/11/2020 4:40	1/12/2020 9:10	28.6	1.67	4.58	171,447
1/12/2020 9:10	1/12/2020 20:20	11.2	0.41	0.04	0.24	10.3	1/12/2020 9:10	1/13/2020 8:15	23.2	1.57	3.86	131,208
1/15/2020 11:30	1/16/2020 12:25	24.9	0.80	0.03	0.24	64.2	1/15/2020 11:25	1/17/2020 0:20	37.0	0.55	0.99	72,813
1/17/2020 20:30	1/18/2020 10:45	14.3	0.35	0.02	0.24	32.2	1/17/2020 20:25	1/18/2020 22:45	26.4	1.38	3.86	131,007
1/21/2020 3:35	1/21/2020 22:40	19.1	0.81	0.04	0.36	67.9	1/21/2020 3:30	1/22/2020 8:35	29.2	1.44	5.36	150,888
1/22/2020 8:35	1/23/2020 0:40	16.1	0.30	0.02	0.12	10.8	1/22/2020 8:35	1/23/2020 5:10	20.7	1.37	2.44	101,604
1/23/2020 5:15	1/24/2020 7:55	26.7	0.99	0.04	0.36	10.3	1/23/2020 5:10	1/24/2020 10:50	29.8	2.34	4.58	251,071
1/24/2020 10:50	1/25/2020 8:10	21.3	0.27	0.01	0.12	7.2	1/24/2020 10:50	1/25/2020 12:40	25.9	1.68	4.33	156,744
1/25/2020 12:45	1/25/2020 15:05	2.3	0.04	0.02	0.12	8.7	1/25/2020 12:40	1/26/2020 1:15	12.7	1.05	1.63	47,844
1/26/2020 1:20	1/26/2020 11:20	10.0	0.30	0.03	0.24	12.6	1/26/2020 1:15	1/26/2020 19:45	18.6	1.42	3.21	95,256
1/26/2020 19:45	1/26/2020 21:20	1.6	0.05	0.03	0.12	14.3	1/26/2020 19:45	1/27/2020 9:20	13.7	0.80	1.35	39,162
1/27/2020 17:15	1/28/2020 11:10	17.9	0.96	0.05	0.36	21.5	1/27/2020 17:10	1/28/2020 20:35	27.5	2.34	5.92	231,828
1/28/2020 20:35	1/29/2020 0:50	4.3	0.03	0.01	0.12	12.9	1/28/2020 20:35	1/29/2020 10:05	13.6	1.18	2.26	57,789
1/29/2020 10:05	1/29/2020 17:25	7.3	0.10	0.01	0.12	26.4	1/29/2020 10:05	1/30/2020 5:25	19.4	0.91	1.78	63,495
1/30/2020 15:10	1/31/2020 3:30	12.3	0.16	0.01	0.12	27.1	1/30/2020 15:10	1/31/2020 8:15	17.2	0.91	2.09	56,235
1/31/2020 8:15	2/2/2020 1:10	40.9	1.33	0.03	0.24	10.4	1/31/2020 8:15	2/2/2020 10:50	50.7	2.22	5.92	405,616
2/2/2020 10:50	2/2/2020 11:35	0.8	0.03	0.04	0.12	10.2	2/2/2020 10:50	2/2/2020 23:35	12.8	1.27	1.49	58,848
2/3/2020 0:25	2/3/2020 2:10	1.8	0.08	0.05	0.12	23.8	2/3/2020 0:20	2/3/2020 14:10	13.9	1.07	2.26	53,739
2/4/2020 12:15	2/7/2020 10:30	70.3	4.55	0.06	0.24	34.6	2/4/2020 12:10	2/7/2020 15:20	75.3	6.08	13.57	1,646,066
2/7/2020 15:20	2/7/2020 20:35	5.3	0.23	0.04	0.24	7.1	2/7/2020 15:20	2/8/2020 3:45	12.5	2.56	5.07	115,008
2/8/2020 3:50	2/8/2020 13:35	9.8	0.20	0.02	0.24	9.0	2/8/2020 3:45	2/9/2020 1:30	21.8	1.59	5.07	125,244
2/13/2020 15:55	2/13/2020 19:35	3.7	0.13	0.04	0.36	128.1	2/13/2020 15:55	2/14/2020 7:30	15.7	0.44	1.70	24,993
2/14/2020 21:35	2/15/2020 3:10	5.6	0.06	0.01	0.12	26.8	2/14/2020 21:35	2/15/2020 15:10	17.7	0.24	0.76	14,979
2/15/2020 19:55	2/16/2020 3:50	7.9	0.28	0.04	0.48	20.5	2/15/2020 19:50	2/16/2020 14:55	19.2	0.59	3.48	40,950
2/16/2020 15:00	2/16/2020 17:15	2.3	0.08	0.04	0.12	15.4	2/16/2020 14:55	2/17/2020 5:10	14.3	0.40	2.71	20,835
2/23/2020 4:50	2/23/2020 7:35	2.8	0.15	0.05	0.36	156.8	2/23/2020 4:50	2/23/2020 19:30	14.8	0.33	2.95	17,658
2/28/2020 16:50	2/28/2020 23:55	7.1	0.10	0.01	0.12	129.3	2/28/2020 16:50	2/29/2020 11:55	19.2	0.21	1.87	14,271
3/1/2020 0:00	3/1/2020 4:50	4.8	0.07	0.01	0.12	30.1	2/29/2020 23:55	3/1/2020 16:50	17.0	0.15	0.67	8,877
3/1/2020 19:10	3/1/2020 21:15	2.1	0.09	0.04	0.12	14.8	3/1/2020 19:05	3/2/2020 3:30	8.5	0.32	1.10	9,855
3/2/2020 3:30	3/3/2020 6:05	26.6	0.46	0.02	0.12	7.0	3/2/2020 3:30	3/3/2020 16:05	36.7	0.59	2.26	77,649
3/3/2020 16:10	3/3/2020 16:45	0.6	0.04	0.07	0.12	11.2	3/3/2020 16:05	3/4/2020 1:05	9.1	0.36	0.98	11,733
3/4/2020 1:10	3/4/2020 5:45	4.6	0.21	0.05	0.36	9.0	3/4/2020 1:05	3/4/2020 17:45	16.8	0.60	2.71	36,111
3/5/2020 18:45	3/6/2020 12:25	17.7	0.86	0.05	0.24	37.2	3/5/2020 18:45	3/7/2020 0:20	29.7	1.40	3.76	149,925
3/7/2020 11:35	3/7/2020 12:40	1.1	0.03	0.03	0.12	24.7	3/7/2020 11:35	3/7/2020 21:40	10.2	0.57	1.10	20,889
3/7/2020 21:45	3/8/2020 8:05	10.3	0.35	0.03	0.60	34.8	3/7/2020 21:40	3/8/2020 20:05	22.5	0.79	3.76	64,203
3/11/2020 4:00	3/11/2020 5:05	1.1	0.07	0.06	0.24	71.5	3/11/2020 3:55	3/11/2020 17:05	13.3	0.28	1.23	13,290
3/13/2020 5:40	3/13/2020 19:35	13.9	0.27	0.02	0.12	48.8	3/13/2020 5:35	3/14/2020 7:35	26.1	0.42	0.87	39,879
3/24/2020 14:50	3/25/2020 9:25	18.6	0.38	0.02	0.72	262.0	3/24/2020 14:45	3/25/2020 12:45	22.1	0.26	1.38	20,547
3/25/2020 12:50	3/25/2020 13:05	0.3	0.05	0.20	0.36	7.2	3/25/2020 12:45	3/26/2020 1:05	12.4	0.27	1.70	11,892
3/26/2020 11:55	3/26/2020 14:15	2.3	0.03	0.01	0.12	23.0	3/26/2020 11:55	3/27/2020 2:15	14.4	0.14	0.14	7,221

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)
3/28/2020 2:25	3/28/2020 4:40	2.3	0.04	0.02	0.12	61.5	3/28/2020 2:25	3/28/2020 15:45	13.4	0.18	0.37	8,613
3/28/2020 15:50	3/29/2020 6:15	14.4	0.71	0.05	0.24	13.4	3/28/2020 15:45	3/29/2020 18:10	26.5	1.10	4.06	104,721
3/30/2020 1:15	3/30/2020 5:00	3.8	0.33	0.09	0.48	20.6	3/30/2020 1:15	3/30/2020 12:10	11.0	1.25	4.72	49,620
3/30/2020 12:10	3/31/2020 4:30	16.3	0.38	0.02	0.48	7.5	3/30/2020 12:10	3/31/2020 14:45	26.7	1.28	6.65	123,033
3/31/2020 14:50	3/31/2020 17:50	3.0	0.13	0.04	0.24	17.1	3/31/2020 14:45	4/1/2020 3:45	13.1	0.97	4.38	45,678
4/1/2020 3:50	4/1/2020 14:40	10.8	0.23	0.02	0.24	10.2	4/1/2020 3:45	4/2/2020 2:35	22.9	0.82	2.95	67,914
4/3/2020 14:30	4/3/2020 20:10	5.7	0.17	0.03	0.24	47.9	4/3/2020 14:25	4/4/2020 8:10	17.8	0.46	1.10	29,523
4/11/2020 11:10	4/11/2020 12:25	1.3	0.06	0.05	0.12	183.9	4/11/2020 11:10	4/12/2020 0:20	13.3	0.18	0.58	8,775
4/18/2020 1:00	4/18/2020 10:00	9.0	0.06	0.01	0.12	157.7	4/18/2020 0:55	4/18/2020 21:55	21.1	0.14	0.37	10,782
4/22/2020 5:30	4/23/2020 8:40	27.2	1.08	0.04	0.24	95.2	4/22/2020 5:25	4/23/2020 16:05	34.8	1.09	3.20	136,020
4/23/2020 16:05	4/23/2020 22:15	6.2	0.29	0.05	0.36	13.2	4/23/2020 16:05	4/24/2020 10:15	18.3	0.70	1.23	46,236
4/25/2020 6:15	4/25/2020 10:15	4.0	0.38	0.10	0.48	33.3	4/25/2020 6:15	4/25/2020 22:15	16.1	1.04	6.23	60,150
4/26/2020 22:05	4/27/2020 1:55	3.8	0.11	0.03	0.12	36.8	4/26/2020 22:05	4/27/2020 13:50	15.8	0.39	0.98	22,392
4/29/2020 19:05	4/29/2020 19:35	0.5	0.03	0.06	0.12	66.0	4/29/2020 19:05	4/30/2020 7:30	12.5	0.17	0.26	7,554
5/2/2020 3:05	5/2/2020 6:35	3.5	0.12	0.03	0.24	122.0	5/2/2020 3:05	5/2/2020 10:15	7.3	0.31	1.87	7,989
5/2/2020 10:20	5/2/2020 15:30	5.2	0.43	0.08	0.48	6.7	5/2/2020 10:15	5/3/2020 3:30	17.3	0.85	5.07	52,860
5/5/2020 19:50	5/6/2020 9:10	13.3	0.30	0.02	1.08	77.7	5/5/2020 19:50	5/6/2020 21:10	25.4	0.32	2.71	29,232
5/11/2020 18:55	5/11/2020 21:45	2.8	0.08	0.03	0.24	130.2	5/11/2020 18:55	5/12/2020 9:40	14.8	0.12	0.37	6,636
5/13/2020 2:40	5/13/2020 6:10	3.5	0.03	0.01	0.12	29.9	5/13/2020 2:35	5/13/2020 18:10	15.7	0.09	0.11	4,896
5/14/2020 4:35	5/14/2020 8:50	4.3	0.17	0.04	0.36	55.8	5/14/2020 4:30	5/14/2020 20:45	16.3	0.24	1.70	14,100
5/16/2020 13:30	5/17/2020 7:20	17.8	0.66	0.04	0.48	53.9	5/16/2020 13:25	5/17/2020 19:15	29.9	0.84	5.82	90,030
5/20/2020 16:30	5/20/2020 20:05	3.6	0.11	0.03	0.12	86.9	5/20/2020 16:25	5/21/2020 1:50	9.5	0.25	0.43	8,574
5/21/2020 1:55	5/21/2020 17:10	15.3	1.01	0.07	0.60	6.3	5/21/2020 1:50	5/22/2020 5:10	27.4	1.57	7.56	155,023
5/22/2020 15:20	5/23/2020 4:55	13.6	0.24	0.02	0.24	22.3	5/22/2020 15:20	5/23/2020 16:50	25.6	0.62	1.70	57,423
5/25/2020 4:10	5/25/2020 18:50	14.7	0.24	0.02	0.12	49.1	5/25/2020 4:05	5/26/2020 6:45	26.8	0.45	1.23	43,164
5/30/2020 7:10	5/31/2020 11:15	28.1	1.50	0.05	0.48	117.7	5/30/2020 7:05	5/31/2020 23:10	40.2	1.72	7.09	248,069
6/5/2020 20:30	6/5/2020 20:35	0.1	0.12	1.44	0.84	130.9	6/5/2020 20:25	6/6/2020 8:35	12.3	0.26	1.87	11,445
6/6/2020 23:00	6/7/2020 10:25	11.4	0.70	0.06	0.60	26.4	6/6/2020 23:00	6/7/2020 22:25	23.5	1.15	6.23	97,584
6/9/2020 0:10	6/9/2020 12:35	12.4	0.29	0.02	0.12	40.9	6/9/2020 0:10	6/9/2020 18:40	18.6	0.66	1.53	43,830
6/9/2020 18:45	6/9/2020 20:15	1.5	0.03	0.02	0.12	8.7	6/9/2020 18:40	6/10/2020 8:10	13.6	0.36	0.50	17,703
6/11/2020 9:15	6/11/2020 12:05	2.8	0.21	0.07	0.24	47.2	6/11/2020 9:10	6/12/2020 0:05	15.0	0.32	2.48	17,511
6/12/2020 11:35	6/12/2020 14:55	3.3	0.25	0.08	0.24	24.6	6/12/2020 11:35	6/12/2020 21:10	9.7	0.53	2.71	18,357
6/12/2020 21:15	6/13/2020 0:30	3.3	0.10	0.03	0.24	6.8	6/12/2020 21:10	6/13/2020 12:30	15.4	0.24	1.23	13,362
6/13/2020 20:20	6/13/2020 23:50	3.5	0.35	0.10	0.36	20.6	6/13/2020 20:15	6/14/2020 11:50	15.7	0.49	3.76	27,879
6/15/2020 4:35	6/15/2020 10:35	6.0	0.11	0.02	0.12	29.8	6/15/2020 4:30	6/15/2020 22:30	18.1	0.17	0.50	11,298

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)
10/3/2019 1:40	10/3/2019 2:45	1.1	0.03	0.03	0.12	95.8	10/3/2019 1:40	10/3/2019 14:45	13.2	0.02	0.02	786
10/3/2019 17:25	10/3/2019 17:50	0.4	0.03	0.07	0.12	111.6	10/3/2019 17:25	10/4/2019 2:25	9.1	0.01	0.02	
10/4/2019 2:30	10/4/2019 4:50	2.3	0.04	0.02	0.12	120.7	10/4/2019 2:25	10/4/2019 16:50	14.5	0.01	0.02	
10/7/2019 18:45	10/8/2019 15:45	21.0	0.65	0.03	1.32	88.2	10/7/2019 18:40	10/9/2019 3:40	33.1	0.12	0.23	
10/16/2019 5:15	10/16/2019 9:50	4.6	0.13	0.03	0.12	186.7	10/16/2019 5:10	10/16/2019 15:40	10.6	0.03	0.04	
10/16/2019 15:40	10/16/2019 20:10	4.5	0.23	0.05	0.24	6.7	10/16/2019 15:40	10/17/2019 4:15	12.7	0.10	0.12	
10/17/2019 4:20	10/17/2019 17:40	13.3	0.10	0.01	0.12	11.5	10/17/2019 4:15	10/18/2019 5:35	25.4	0.06	0.10	
10/18/2019 15:10	10/19/2019 12:25	21.3	1.03	0.05	0.48	25.3	10/18/2019 15:10	10/20/2019 0:20	33.3	0.36	0.54	
10/20/2019 7:05	10/21/2019 0:30	17.4	0.30	0.02	0.48	19.9	10/20/2019 7:05	10/21/2019 7:50	24.8	0.24	0.40	
10/21/2019 7:50	10/22/2019 5:20	21.5	0.93	0.04	0.48	9.5	10/21/2019 7:50	10/22/2019 17:20	33.6	0.67	1.19	
10/25/2019 9:40	10/25/2019 20:50	11.2	0.33	0.03	0.36	77.8	10/25/2019 9:40	10/26/2019 8:45	23.2	0.18	0.23	
11/9/2019 0:40	11/9/2019 16:25	15.8	0.33	0.02	0.24	339.9	11/9/2019 0:40	11/10/2019 4:25	27.8	0.13	0.19	
11/12/2019 3:55	11/12/2019 7:50	3.9	0.30	0.08	0.12	60.4	11/12/2019 3:55	11/12/2019 19:50	16.0	0.21	0.28	
11/15/2019 3:40	11/15/2019 5:40	2.0	0.19	0.10	0.24	68.5	11/15/2019 3:40	11/15/2019 17:25	13.8	0.15	0.19	
11/15/2019 17:25	11/15/2019 19:40	2.3	0.81	0.36	0.96	12.4	11/15/2019 17:25	11/16/2019 7:40	14.3	0.52	0.86	
11/16/2019 14:35	11/16/2019 18:15	3.7	0.07	0.02	0.12	19.0	11/16/2019 14:35	11/16/2019 23:25	8.9	0.29	0.33	
11/16/2019 23:25	11/17/2019 20:50	21.4	0.40	0.02	0.36	6.6	11/16/2019 23:25	11/18/2019 8:45	33.4	0.33	0.47	
11/18/2019 11:50	11/19/2019 1:55	14.1	0.41	0.03	0.24	16.3	11/18/2019 11:50	11/19/2019 3:20	15.6	0.52	0.74	
11/19/2019 3:25	11/19/2019 9:55	6.5	0.11	0.02	0.12	7.1	11/19/2019 3:20	11/19/2019 21:55	18.7	0.45	0.54	
11/23/2019 23:00	11/24/2019 5:50	6.8	0.12	0.02	0.12	111.9	11/23/2019 23:00	11/24/2019 17:45	18.8	0.08	0.12	
11/24/2019 21:25	11/25/2019 8:30	11.1	0.52	0.05	0.60	20.1	11/24/2019 21:20	11/25/2019 15:00	17.8	0.28	0.47	
11/25/2019 15:05	11/26/2019 4:20	13.3	0.21	0.02	0.24	7.4	11/25/2019 15:00	11/26/2019 16:15	25.3	0.36	0.47	
12/1/2019 11:25	12/1/2019 13:40	2.3	0.03	0.01	0.12	133.9	12/1/2019 11:25	12/2/2019 1:40	14.3	0.06	0.06	
12/6/2019 20:20	12/7/2019 16:45	20.4	0.39	0.02	0.12	262.8	12/6/2019 20:15	12/8/2019 4:40	32.5	0.17	0.28	
12/10/2019 11:30	12/10/2019 21:55	10.4	0.21	0.02	0.12	72.6	12/10/2019 11:25	12/11/2019 9:55	22.6	0.14	0.19	
12/11/2019 9:55	12/12/2019 0:15	14.3	0.34	0.02	0.12	14.9	12/11/2019 9:55	12/12/2019 6:10	20.3	0.28	0.40	
12/12/2019 6:10	12/12/2019 9:05	2.9	0.04	0.01	0.12	7.5	12/12/2019 6:10	12/12/2019 13:40	7.6	0.28	0.28	
12/12/2019 13:45	12/12/2019 17:30	3.8	0.11	0.03	0.24	7.6	12/12/2019 13:40	12/13/2019 5:25	15.8	0.28	0.33	
12/13/2019 23:55	12/14/2019 15:55	16.0	0.50	0.03	0.84	33.4	12/13/2019 23:55	12/14/2019 23:35	23.8	0.62	0.80	
12/14/2019 23:35	12/15/2019 7:15	7.7	0.10	0.01	0.12	8.0	12/14/2019 23:35	12/15/2019 19:15	19.8	0.48	0.63	
12/18/2019 18:00	12/19/2019 7:25	13.4	0.32	0.02	0.12	84.0	12/18/2019 17:55	12/19/2019 12:10	18.3	0.27	0.40	
12/19/2019 12:10	12/21/2019 18:50	54.7	4.87	0.09	1.44	11.8	12/19/2019 12:10	12/22/2019 6:45	66.7	2.41	6.08	
12/22/2019 16:55	12/23/2019 4:00	11.1	0.19	0.02	0.12	27.6	12/22/2019 16:55	12/23/2019 16:00	23.2	0.47	0.54	
12/30/2019 4:45	12/30/2019 7:20	2.6	0.05	0.02	0.12	171.4	12/30/2019 4:40	12/30/2019 19:20	14.8	0.06	0.07	
12/31/2019 8:10	12/31/2019 15:25	7.3	0.07	0.01	0.24	26.9	12/31/2019 8:10	1/1/2020 3:25	18.3	0.06	0.12	
1/1/2020 7:10	1/1/2020 8:15	1.1	0.37	0.34	1.08	15.9	1/1/2020 7:05	1/1/2020 19:25	12.4	0.24	0.28	
1/1/2020 19:30	1/2/2020 7:30	12.0	0.50	0.04	0.48	11.9	1/1/2020 19:25	1/2/2020 11:55	16.6	0.42	0.63	
1/2/2020 11:55	1/2/2020 19:40	7.8	0.11	0.01	0.12	10.9	1/2/2020 11:55	1/3/2020 7:40	19.8	0.28	0.33	
1/3/2020 20:15	1/4/2020 1:05	4.8	0.30	0.06	0.12	28.3	1/3/2020 20:10	1/4/2020 13:05	17.0	0.25	0.33	
1/4/2020 15:30	1/4/2020 16:50	1.3	0.03	0.02	0.12	15.4	1/4/2020 15:30	1/5/2020 3:30	12.1	0.16	0.19	
1/5/2020 3:30	1/5/2020 15:15	11.8	0.30	0.03	0.24	27.4	1/5/2020 3:30	1/6/2020 2:20	22.9	0.19	0.23	
1/6/2020 2:20	1/6/2020 8:00	5.7	0.03	0.01	0.12	11.5	1/6/2020 2:20	1/6/2020 13:30	11.3	0.16	0.19	
1/6/2020 13:35	1/7/2020 9:00	19.4	0.33	0.02	0.12	22.8	1/6/2020 13:30	1/7/2020 15:40	26.3	0.21	0.28	

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)
1/7/2020 15:40	1/7/2020 21:05	5.4	0.08	0.01	0.12	10.2	1/7/2020 15:40	1/8/2020 9:00	17.4	0.21	0.23	
1/8/2020 18:15	1/8/2020 21:55	3.7	0.04	0.01	0.12	24.9	1/8/2020 18:10	1/9/2020 6:55	12.8	0.13	0.15	
1/9/2020 7:00	1/9/2020 10:10	3.2	0.08	0.03	0.12	12.8	1/9/2020 6:55	1/9/2020 22:05	15.3	0.12	0.12	
1/10/2020 3:00	1/10/2020 21:50	18.8	0.42	0.02	0.12	18.4	1/10/2020 2:55	1/11/2020 4:40	25.8	0.23	0.28	
1/11/2020 4:40	1/12/2020 1:50	21.2	0.73	0.03	0.36	9.2	1/11/2020 4:40	1/12/2020 9:10	28.6	0.54	0.92	
1/12/2020 9:10	1/12/2020 20:20	11.2	0.41	0.04	0.24	10.3	1/12/2020 9:10	1/13/2020 8:15	23.2	0.55	0.74	
1/15/2020 11:30	1/16/2020 12:25	24.9	0.80	0.03	0.24	64.2	1/15/2020 11:25	1/17/2020 0:20	37.0	0.18	0.23	
1/17/2020 20:30	1/18/2020 10:45	14.3	0.35	0.02	0.24	32.2	1/17/2020 20:25	1/18/2020 22:45	26.4	0.46	0.74	
1/21/2020 3:35	1/21/2020 22:40	19.1	0.81	0.04	0.36	67.9	1/21/2020 3:30	1/22/2020 8:35	29.2	0.45	0.99	
1/22/2020 8:35	1/23/2020 0:40	16.1	0.30	0.02	0.12	10.8	1/22/2020 8:35	1/23/2020 5:10	20.7	0.57	0.68	
1/23/2020 5:15	1/24/2020 7:55	26.7	0.99	0.04	0.36	10.3	1/23/2020 5:10	1/24/2020 10:50	29.8	0.77	0.99	
1/24/2020 10:50	1/25/2020 8:10	21.3	0.27	0.01	0.12	7.2	1/24/2020 10:50	1/25/2020 12:40	25.9	0.62	0.74	
1/25/2020 12:45	1/25/2020 15:05	2.3	0.04	0.02	0.12	8.7	1/25/2020 12:40	1/26/2020 1:15	12.7	0.39	0.47	
1/26/2020 1:20	1/26/2020 11:20	10.0	0.30	0.03	0.24	12.6	1/26/2020 1:15	1/26/2020 19:45	18.6	0.45	0.63	
1/26/2020 19:45	1/26/2020 21:20	1.6	0.05	0.03	0.12	14.3	1/26/2020 19:45	1/27/2020 9:20	13.7	0.27	0.28	
1/27/2020 17:15	1/28/2020 11:10	17.9	0.96	0.05	0.36	21.5	1/27/2020 17:10	1/28/2020 20:35	27.5	0.72	1.12	
1/28/2020 20:35	1/29/2020 0:50	4.3	0.03	0.01	0.12	12.9	1/28/2020 20:35	1/29/2020 10:05	13.6	0.51	0.63	
1/29/2020 10:05	1/29/2020 17:25	7.3	0.10	0.01	0.12	26.4	1/29/2020 10:05	1/30/2020 5:25	19.4	0.34	0.40	
1/30/2020 15:10	1/31/2020 3:30	12.3	0.16	0.01	0.12	27.1	1/30/2020 15:10	1/31/2020 8:15	17.2	0.23	0.27	
1/31/2020 8:15	2/2/2020 1:10	40.9	1.33	0.03	0.24	10.4	1/31/2020 8:15	2/2/2020 10:50	50.7	0.80	1.65	
2/2/2020 10:50	2/2/2020 11:35	0.8	0.03	0.04	0.12	10.2	2/2/2020 10:50	2/2/2020 23:35	12.8	0.50	0.60	
2/3/2020 0:25	2/3/2020 2:10	1.8	0.08	0.05	0.12	23.8	2/3/2020 0:20	2/3/2020 14:10	13.9	0.40	0.44	
2/4/2020 12:15	2/7/2020 10:30	70.3	4.55	0.06	0.24	34.6	2/4/2020 12:10	2/7/2020 15:20	75.3	1.89	3.37	
2/7/2020 15:20	2/7/2020 20:35	5.3	0.23	0.04	0.24	7.1	2/7/2020 15:20	2/8/2020 3:45	12.5	1.13	1.40	
2/8/2020 3:50	2/8/2020 13:35	9.8	0.20	0.02	0.24	9.0	2/8/2020 3:45	2/9/2020 1:30	21.8	0.74	1.12	
2/13/2020 15:55	2/13/2020 19:35	3.7	0.13	0.04	0.36	128.1	2/13/2020 15:55	2/14/2020 7:30	15.7	0.18	0.23	
2/14/2020 21:35	2/15/2020 3:10	5.6	0.06	0.01	0.12	26.8	2/14/2020 21:35	2/15/2020 15:10	17.7	0.09	0.15	
2/15/2020 19:55	2/16/2020 3:50	7.9	0.28	0.04	0.48	20.5	2/15/2020 19:50	2/16/2020 14:55	19.2	0.24	0.32	
2/16/2020 15:00	2/16/2020 17:15	2.3	0.08	0.04	0.12	15.4	2/16/2020 14:55	2/17/2020 5:10	14.3	0.18	0.23	
2/23/2020 4:50	2/23/2020 7:35	2.8	0.15	0.05	0.36	156.8	2/23/2020 4:50	2/23/2020 19:30	14.8	0.11	0.23	
2/28/2020 16:50	2/28/2020 23:55	7.1	0.10	0.01	0.12	129.3	2/28/2020 16:50	2/29/2020 11:55	19.2	0.03	0.07	
3/1/2020 0:00	3/1/2020 4:50	4.8	0.07	0.01	0.12	30.1	2/29/2020 23:55	3/1/2020 16:50	17.0	0.02	0.07	
3/1/2020 19:10	3/1/2020 21:15	2.1	0.09	0.04	0.12	14.8	3/1/2020 19:05	3/2/2020 3:30	8.5	0.05	0.07	
3/2/2020 3:30	3/3/2020 6:05	26.6	0.46	0.02	0.12	7.0	3/2/2020 3:30	3/3/2020 16:05	36.7	0.15	0.23	
3/3/2020 16:10	3/3/2020 16:45	0.6	0.04	0.07	0.12	11.2	3/3/2020 16:05	3/4/2020 1:05	9.1	0.11	0.15	
3/4/2020 1:10	3/4/2020 5:45	4.6	0.21	0.05	0.36	9.0	3/4/2020 1:05	3/4/2020 17:45	16.8	0.20	0.27	
3/5/2020 18:45	3/6/2020 12:25	17.7	0.86	0.05	0.24	37.2	3/5/2020 18:45	3/7/2020 0:20	29.7	0.56	1.05	
3/7/2020 11:35	3/7/2020 12:40	1.1	0.03	0.03	0.12	24.7	3/7/2020 11:35	3/7/2020 21:40	10.2	0.30	0.32	
3/7/2020 21:45	3/8/2020 8:05	10.3	0.35	0.03	0.60	34.8	3/7/2020 21:40	3/8/2020 20:05	22.5	0.33	0.44	
3/11/2020 4:00	3/11/2020 5:05	1.1	0.07	0.06	0.24	71.5	3/11/2020 3:55	3/11/2020 17:05	13.3	0.12	0.15	
3/13/2020 5:40	3/13/2020 19:35	13.9	0.27	0.02	0.12	48.8	3/13/2020 5:35	3/14/2020 7:35	26.1	0.16	0.23	
3/24/2020 14:50	3/25/2020 9:25	18.6	0.38	0.02	0.72	262.0	3/24/2020 14:45	3/25/2020 12:45	22.1	0.06	0.07	
3/25/2020 12:50	3/25/2020 13:05	0.3	0.05	0.20	0.36	7.2	3/25/2020 12:45	3/26/2020 1:05	12.4	0.07	0.07	
3/26/2020 11:55	3/26/2020 14:15	2.3	0.03	0.01	0.12	23.0	3/26/2020 11:55	3/27/2020 2:15	14.4	0.03	0.04	

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

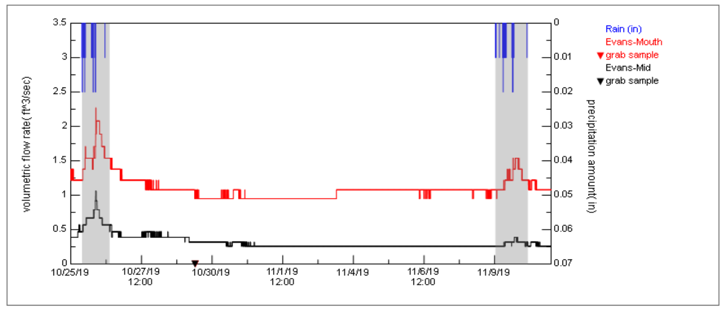
Precipitation Start Time	Precipitation Stop Time	Precipitation Duration (hour)	Precipitation Depth (inch)	Precipitation Average Intensity (inch/hour)	Precipitation Maximum Intensity (inch/hour)	Precipitation Antecedent Dry Period (hour)	Flow Start Time	Flow Stop Time	Flow Duration (hour)	Average Flow Rate ($feet^3$/second)	Maximum Flow Rate ($feet^3$/second)	Flow Volume (feet3)
3/28/2020 2:25	3/28/2020 4:40	2.3	0.04	0.02	0.12	61.5	3/28/2020 2:25	3/28/2020 15:45	13.4	0.04	0.04	
3/28/2020 15:50	3/29/2020 6:15	14.4	0.71	0.05	0.24	13.4	3/28/2020 15:45	3/29/2020 18:10	26.5	0.26	0.52	
3/30/2020 1:15	3/30/2020 5:00	3.8	0.33	0.09	0.48	20.6	3/30/2020 1:15	3/30/2020 12:10	11.0	0.32	0.38	
3/30/2020 12:10	3/31/2020 4:30	16.3	0.38	0.02	0.48	7.5	3/30/2020 12:10	3/31/2020 14:45	26.7	0.41	0.80	
3/31/2020 14:50	3/31/2020 17:50	3.0	0.13	0.04	0.24	17.1	3/31/2020 14:45	4/1/2020 3:45	13.1	0.33	0.38	
4/1/2020 3:50	4/1/2020 14:40	10.8	0.23	0.02	0.24	10.2	4/1/2020 3:45	4/2/2020 2:35	22.9	0.28	0.32	
4/3/2020 14:30	4/3/2020 20:10	5.7	0.17	0.03	0.24	47.9	4/3/2020 14:25	4/4/2020 8:10	17.8	0.14	0.15	
4/11/2020 11:10	4/11/2020 12:25	1.3	0.06	0.05	0.12	183.9	4/11/2020 11:10	4/12/2020 0:20	13.3	0.05	0.07	
4/18/2020 1:00	4/18/2020 10:00	9.0	0.06	0.01	0.12	157.7	4/18/2020 0:55	4/18/2020 21:55	21.1	0.03	0.07	
4/22/2020 5:30	4/23/2020 8:40	27.2	1.08	0.04	0.24	95.2	4/22/2020 5:25	4/23/2020 16:05	34.8	0.24	0.44	
4/23/2020 16:05	4/23/2020 22:15	6.2	0.29	0.05	0.36	13.2	4/23/2020 16:05	4/24/2020 10:15	18.3	0.24	0.27	
4/25/2020 6:15	4/25/2020 10:15	4.0	0.38	0.10	0.48	33.3	4/25/2020 6:15	4/25/2020 22:15	16.1	0.22	0.38	
4/26/2020 22:05	4/27/2020 1:55	3.8	0.11	0.03	0.12	36.8	4/26/2020 22:05	4/27/2020 13:50	15.8	0.12	0.15	
4/29/2020 19:05	4/29/2020 19:35	0.5	0.03	0.06	0.12	66.0	4/29/2020 19:05	4/30/2020 7:30	12.5	0.03	0.04	
5/2/2020 3:05	5/2/2020 6:35	3.5	0.12	0.03	0.24	122.0	5/2/2020 3:05	5/2/2020 10:15	7.3	0.03	0.04	
5/2/2020 10:20	5/2/2020 15:30	5.2	0.43	0.08	0.48	6.7	5/2/2020 10:15	5/3/2020 3:30	17.3	0.11	0.23	
5/5/2020 19:50	5/6/2020 9:10	13.3	0.30	0.02	1.08	77.7	5/5/2020 19:50	5/6/2020 21:10	25.4	0.03	0.04	
5/11/2020 18:55	5/11/2020 21:45	2.8	0.08	0.03	0.24	130.2	5/11/2020 18:55	5/12/2020 9:40	14.8	0.01	0.02	
5/13/2020 2:40	5/13/2020 6:10	3.5	0.03	0.01	0.12	29.9	5/13/2020 2:35	5/13/2020 18:10	15.7	0.01	0.01	
5/14/2020 4:35	5/14/2020 8:50	4.3	0.17	0.04	0.36	55.8	5/14/2020 4:30	5/14/2020 20:45	16.3	0.02	0.03	
5/16/2020 13:30	5/17/2020 7:20	17.8	0.66	0.04	0.48	53.9	5/16/2020 13:25	5/17/2020 19:15	29.9	0.07	0.15	
5/20/2020 16:30	5/20/2020 20:05	3.6	0.11	0.03	0.12	86.9	5/20/2020 16:25	5/21/2020 1:50	9.5	0.01	0.02	
5/21/2020 1:55	5/21/2020 17:10	15.3	1.01	0.07	0.60	6.3	5/21/2020 1:50	5/22/2020 5:10	27.4	0.18	0.32	
5/22/2020 15:20	5/23/2020 4:55	13.6	0.24	0.02	0.24	22.3	5/22/2020 15:20	5/23/2020 16:50	25.6	0.09	0.10	
5/25/2020 4:10	5/25/2020 18:50	14.7	0.24	0.02	0.12	49.1	5/25/2020 4:05	5/26/2020 6:45	26.8	0.04	0.07	
5/30/2020 7:10	5/31/2020 11:15	28.1	1.50	0.05	0.48	117.7	5/30/2020 7:05	5/31/2020 23:10	40.2	0.38	0.92	
6/5/2020 20:30	6/5/2020 20:35	0.1	0.12	1.44	0.84	130.9	6/5/2020 20:25	6/6/2020 8:35	12.3	0.06	0.07	
6/6/2020 23:00	6/7/2020 10:25	11.4	0.70	0.06	0.60	26.4	6/6/2020 23:00	6/7/2020 22:25	23.5	0.25	0.32	
6/9/2020 0:10	6/9/2020 12:35	12.4	0.29	0.02	0.12	40.9	6/9/2020 0:10	6/9/2020 18:40	18.6	0.19	0.23	
6/9/2020 18:45	6/9/2020 20:15	1.5	0.03	0.02	0.12	8.7	6/9/2020 18:40	6/10/2020 8:10	13.6	0.18	0.23	
6/11/2020 9:15	6/11/2020 12:05	2.8	0.21	0.07	0.24	47.2	6/11/2020 9:10	6/12/2020 0:05	15.0	0.11	0.15	
6/12/2020 11:35	6/12/2020 14:55	3.3	0.25	0.08	0.24	24.6	6/12/2020 11:35	6/12/2020 21:10	9.7	0.17	0.23	
6/12/2020 21:15	6/13/2020 0:30	3.3	0.10	0.03	0.24	6.8	6/12/2020 21:10	6/13/2020 12:30	15.4	0.17	0.23	
6/13/2020 20:20	6/13/2020 23:50	3.5	0.35	0.10	0.36	20.6	6/13/2020 20:15	6/14/2020 11:50	15.7	0.25	0.32	

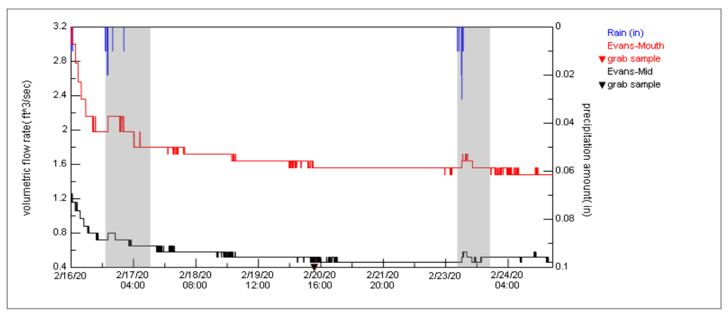
APPENDIX E

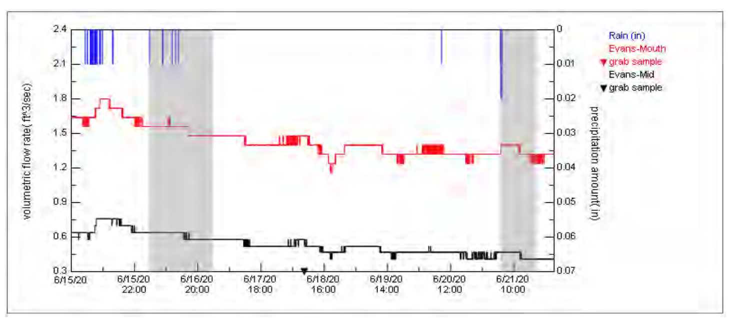
Line Plots Showing Sampling Times Relative to the Storm Event Hydrograph

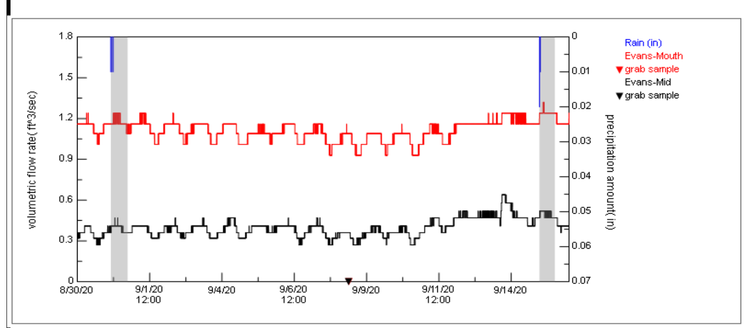
Evans – Application Watershed – Sampled Hydrographs

Base Flow

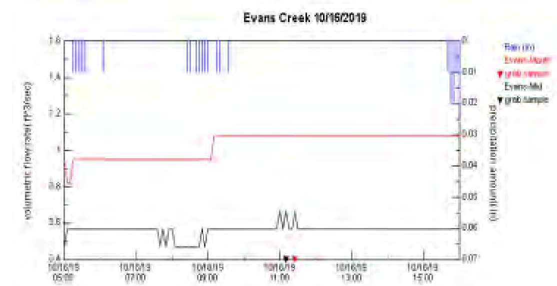


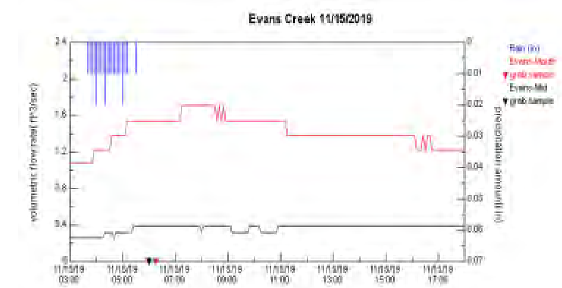


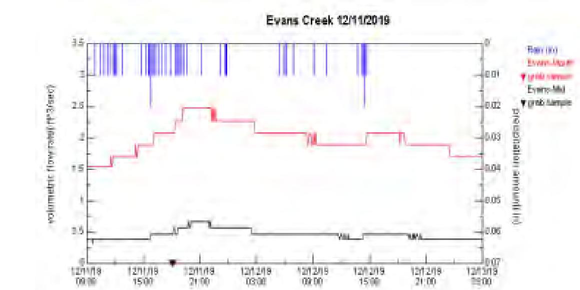


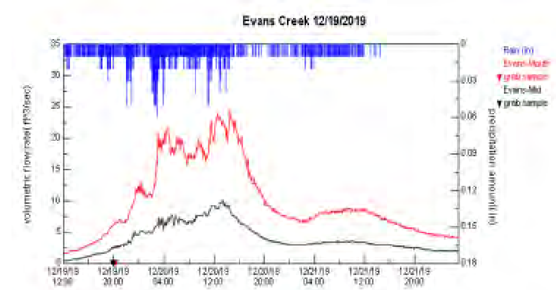


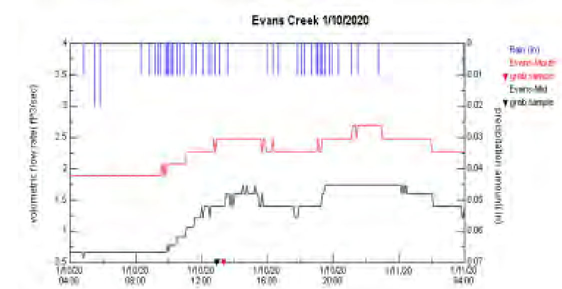
Storm Flow

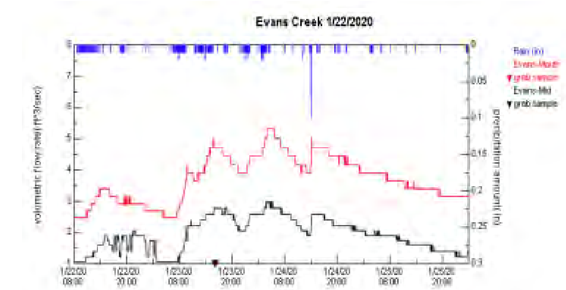


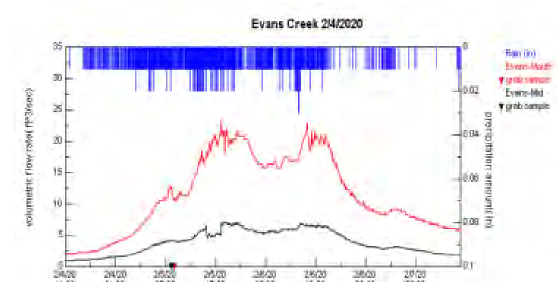


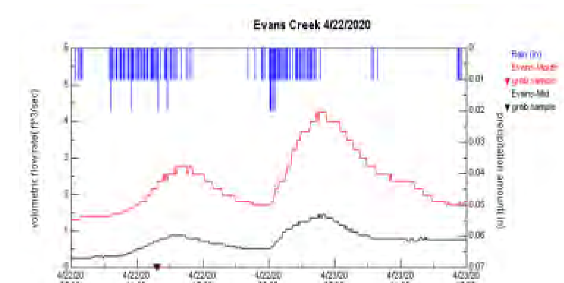


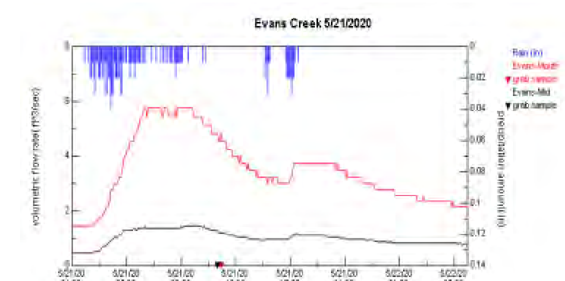


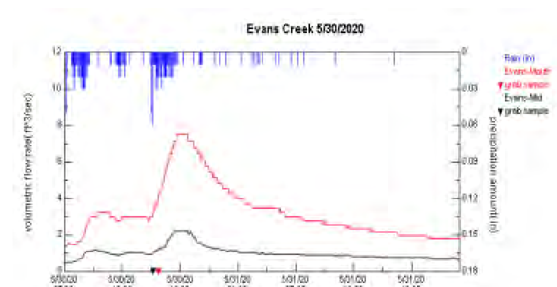


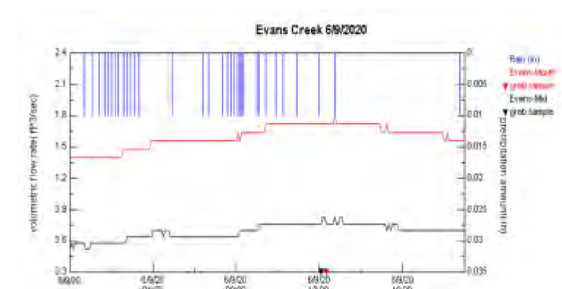


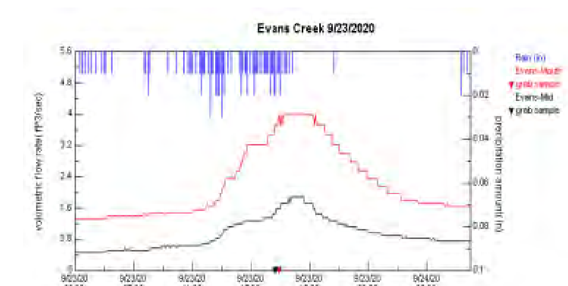






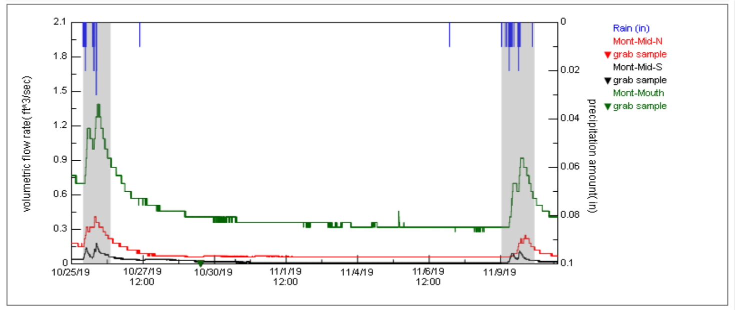


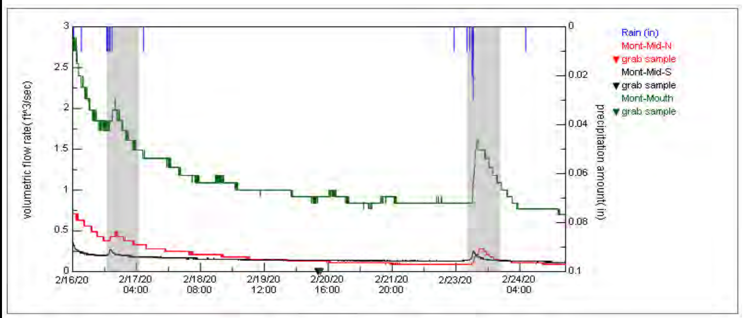


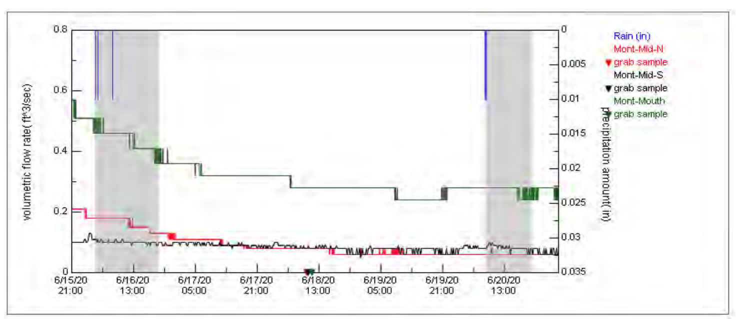


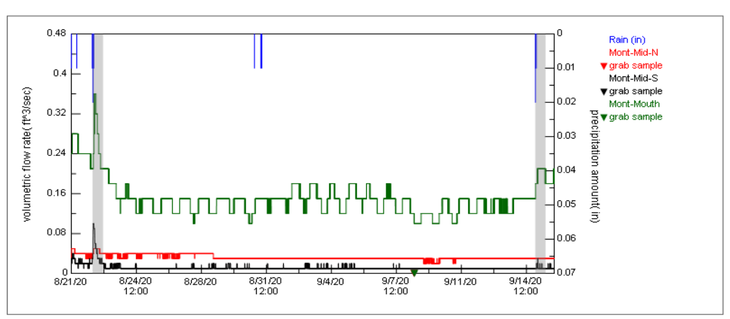
Monticello – Application Watershed – Sampled Hydrographs

Base Flow

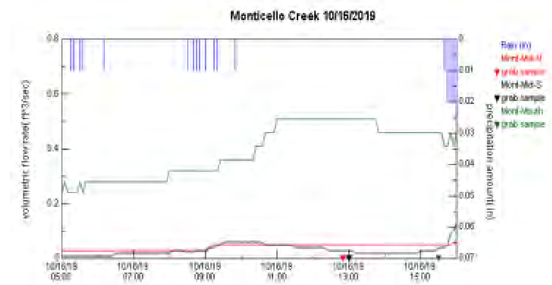


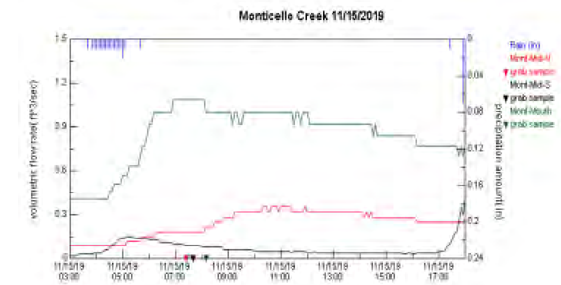


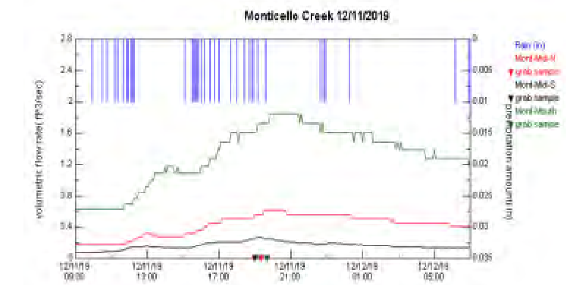


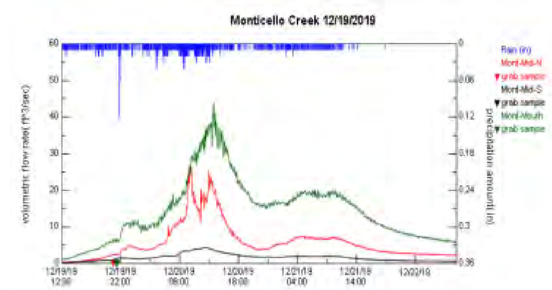


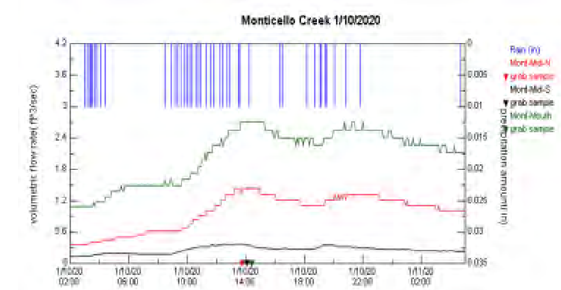
Storm Flow

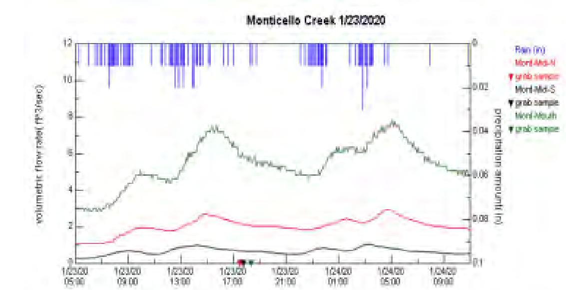


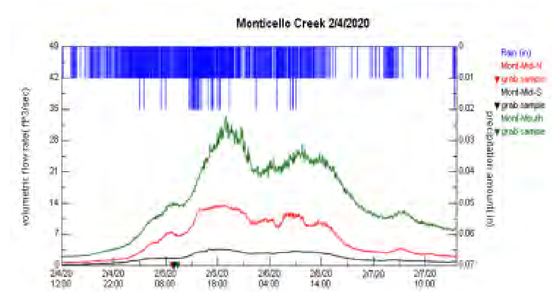


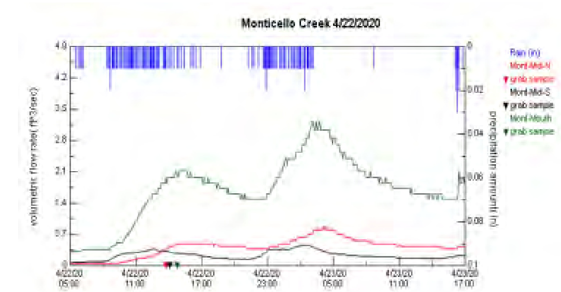


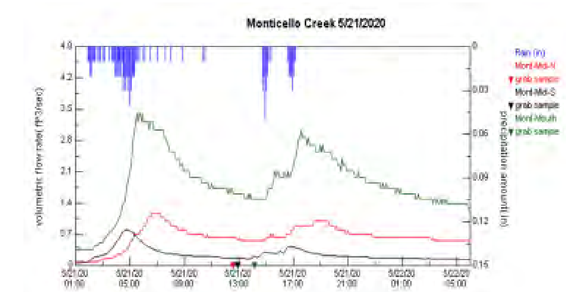


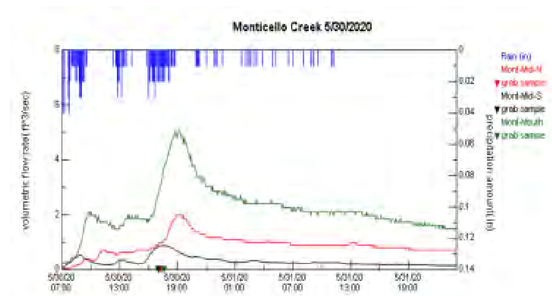


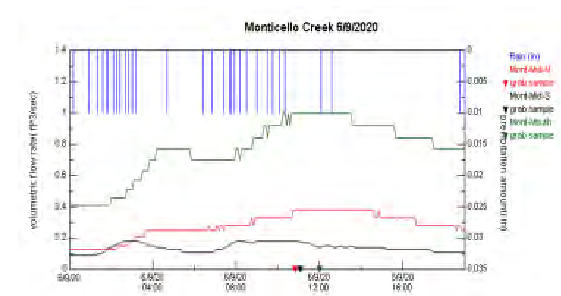


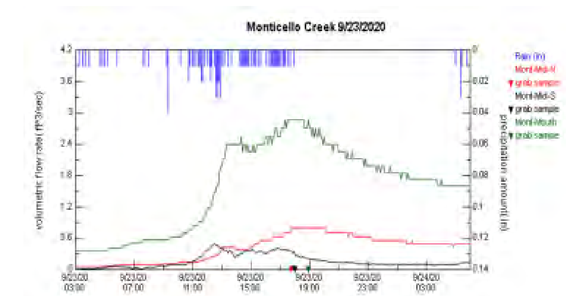






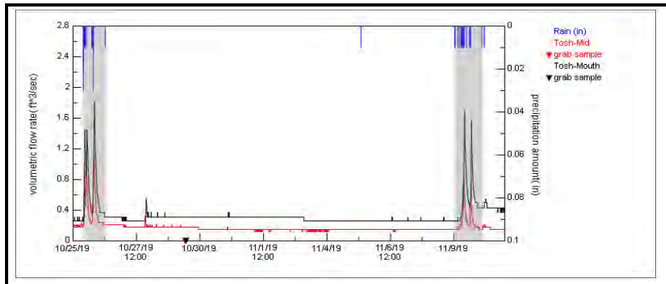


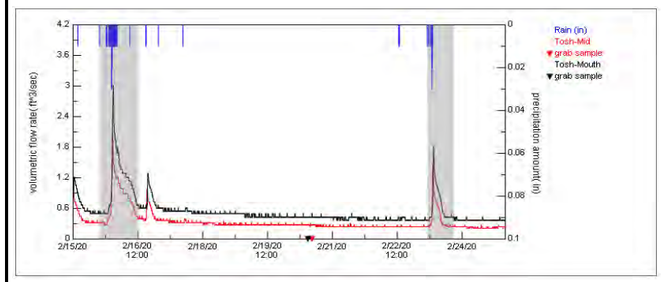


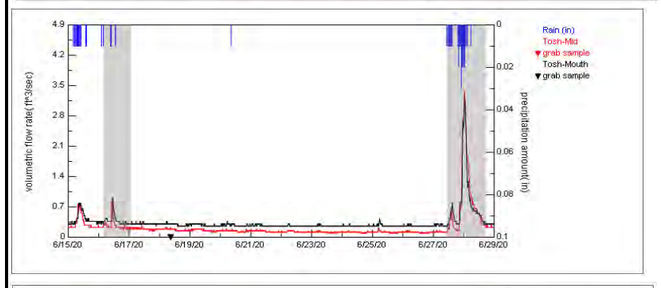


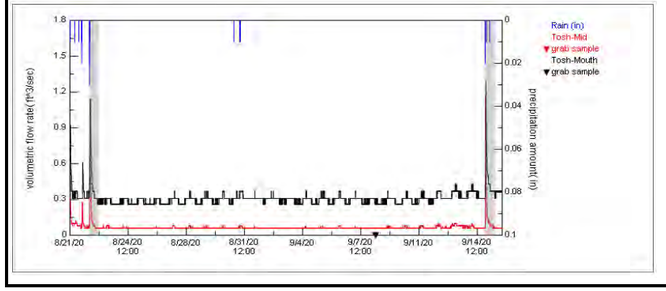
Tosh – Application Watershed – Sampled Hydrographs

Base Flow

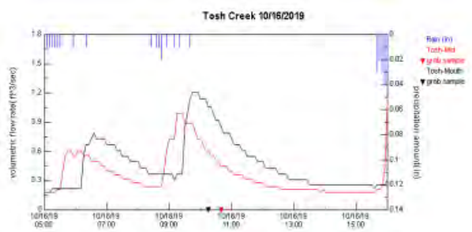


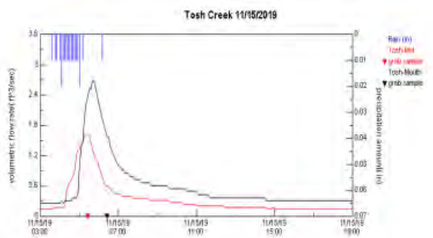


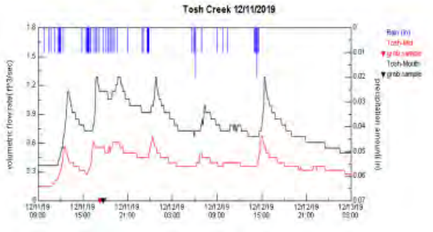


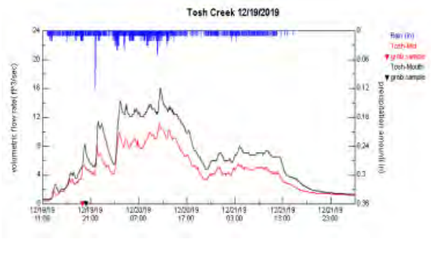


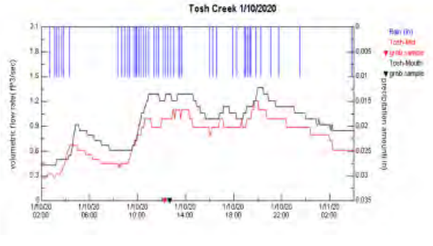
Storm Flow

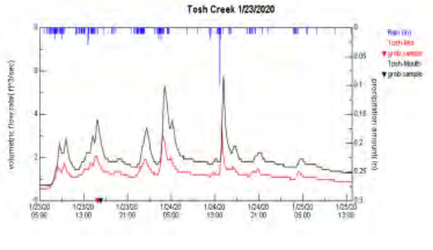


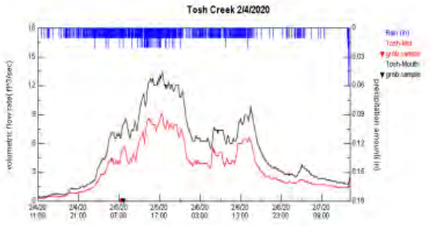


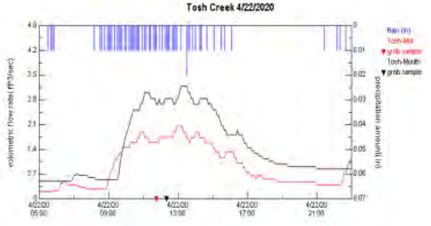


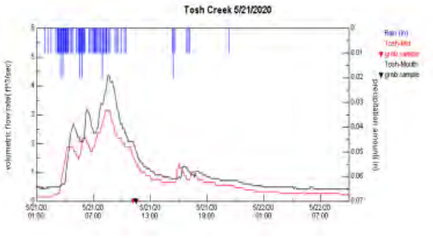


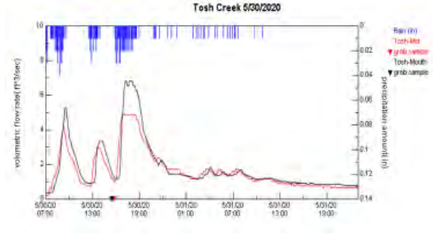


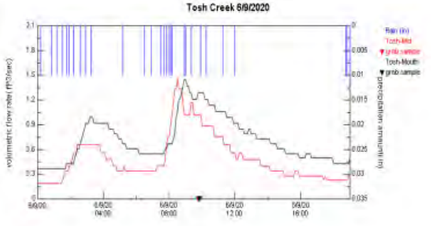


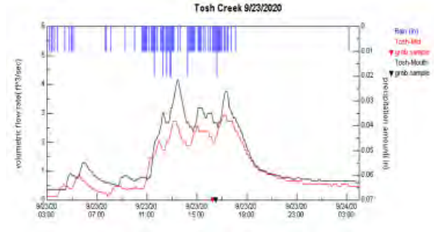






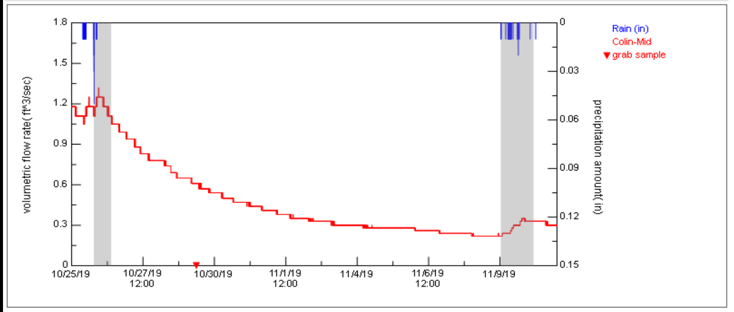


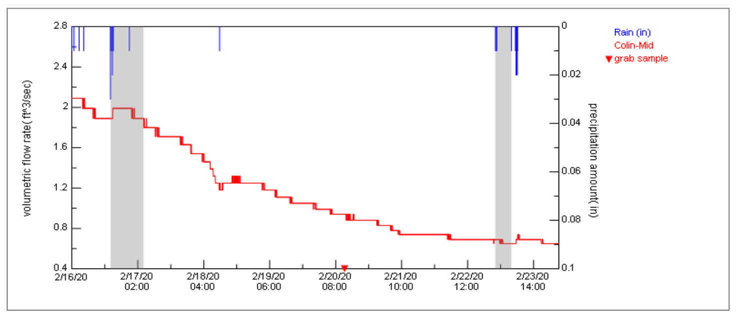


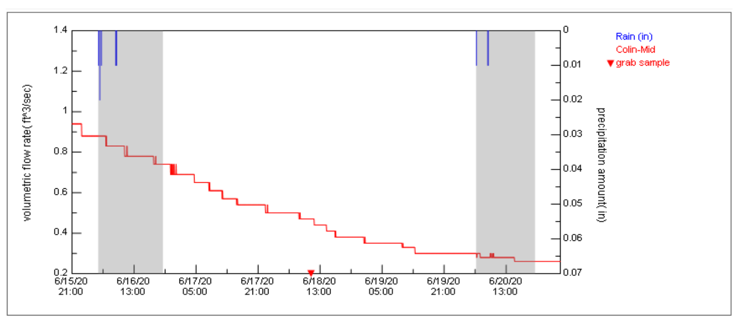


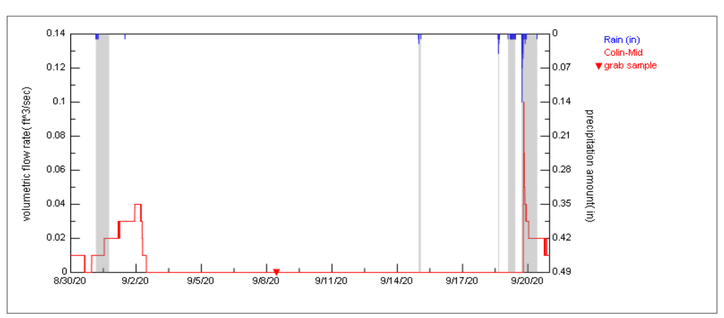
Colin – Application Watershed – Sampled Hydrographs

Base Flow

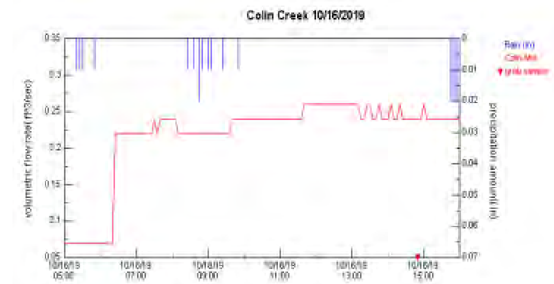


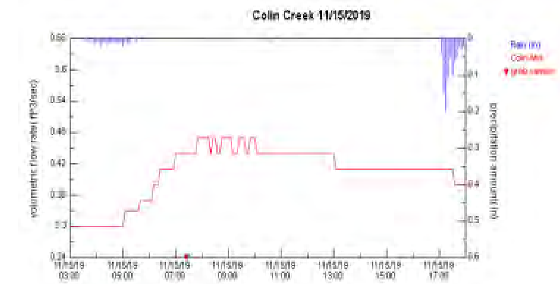


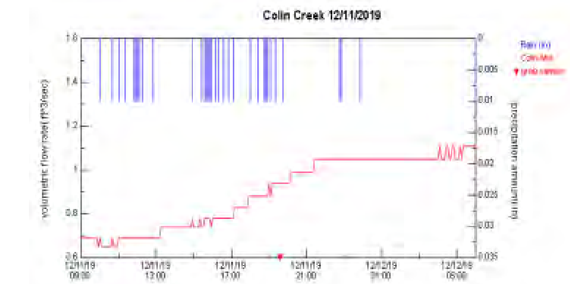


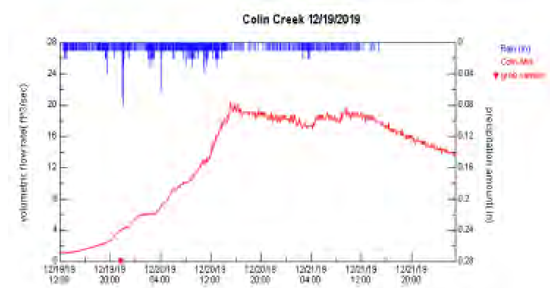


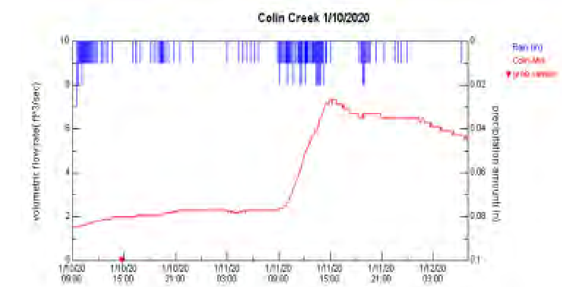
Storm Flow

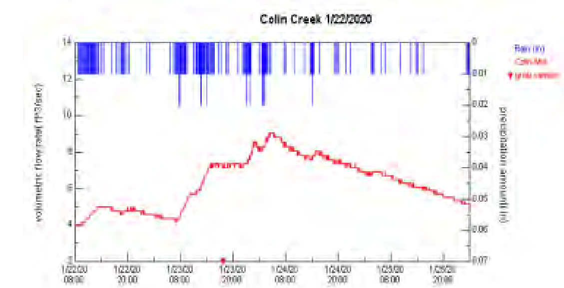


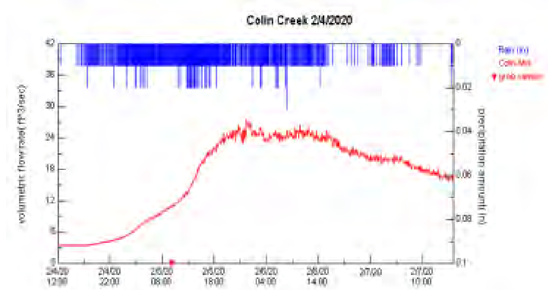


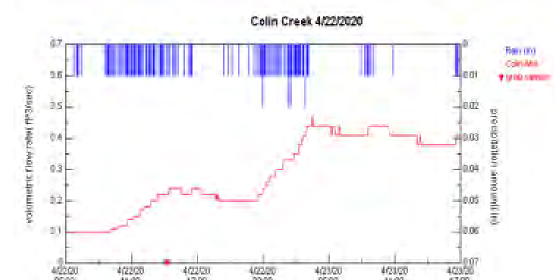


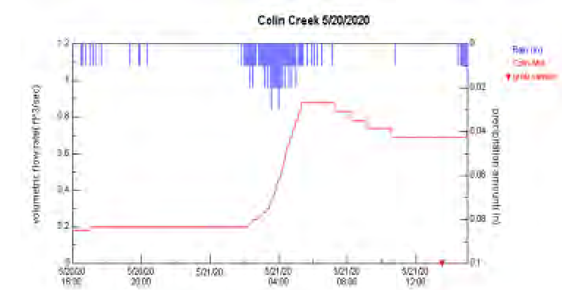


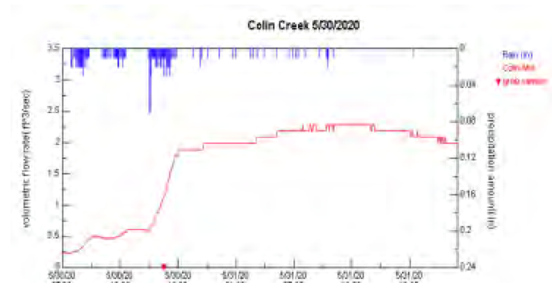


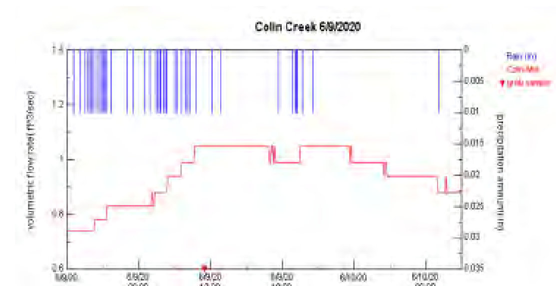


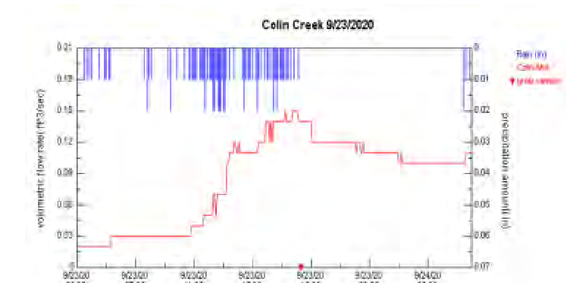






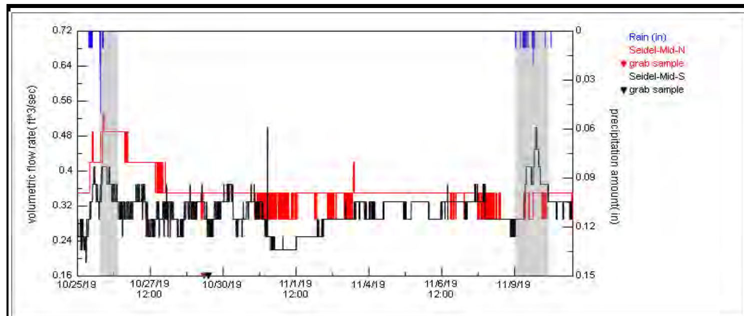


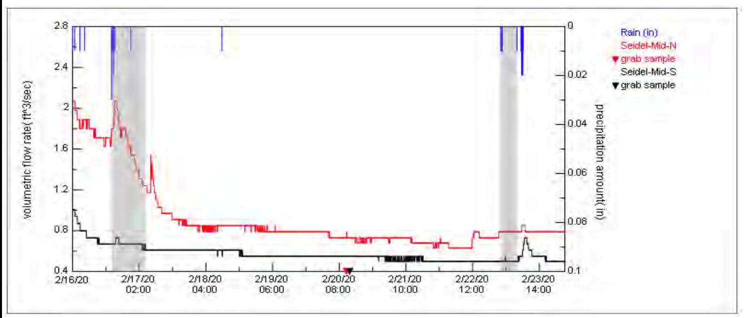


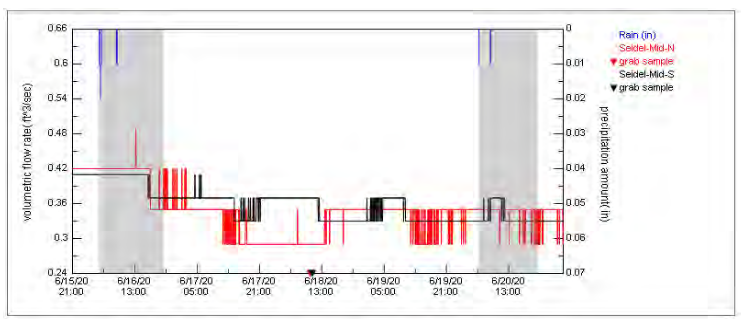


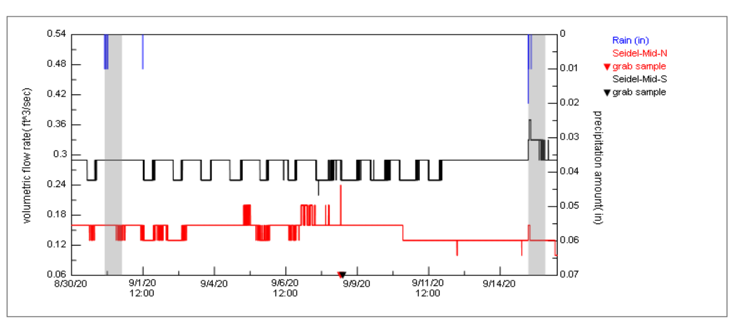
Seidel – Application Watershed – Sampled Hydrographs

Base Flow

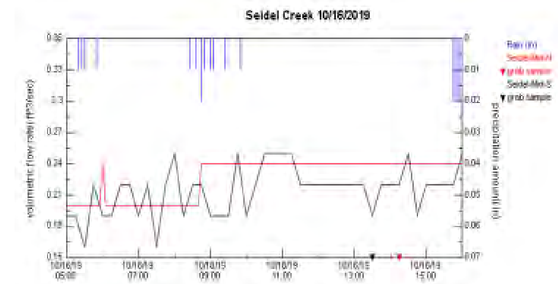


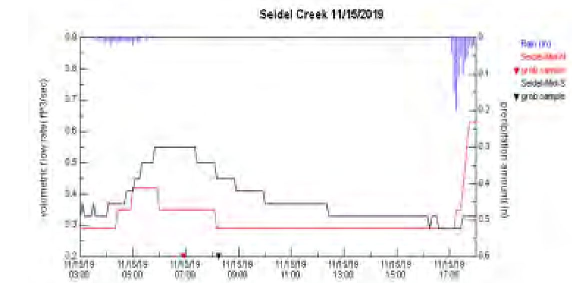


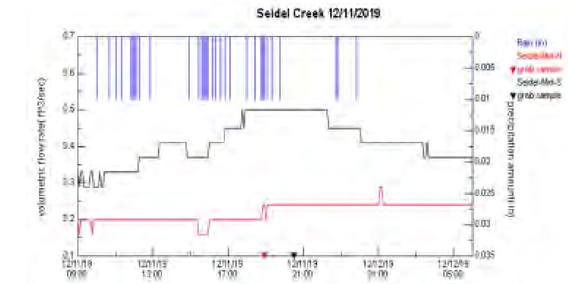


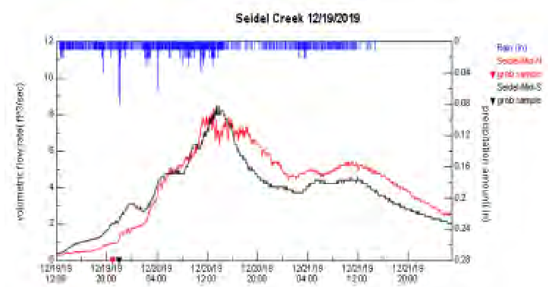


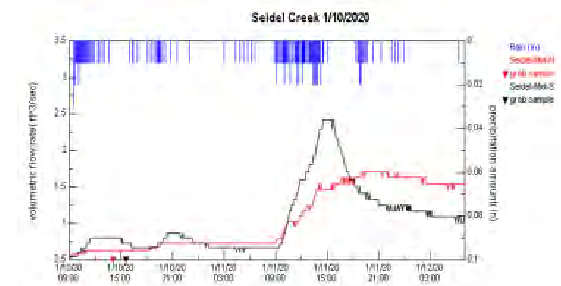
Storm Flow

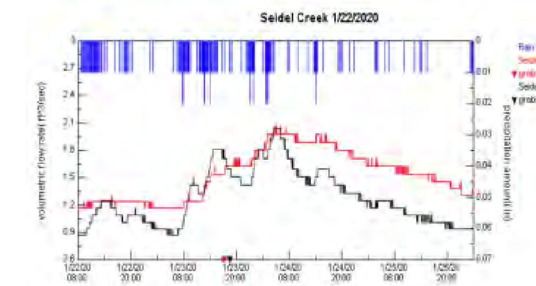


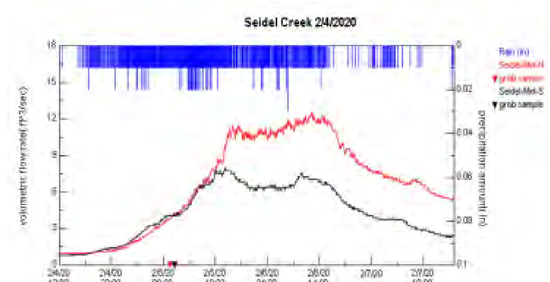


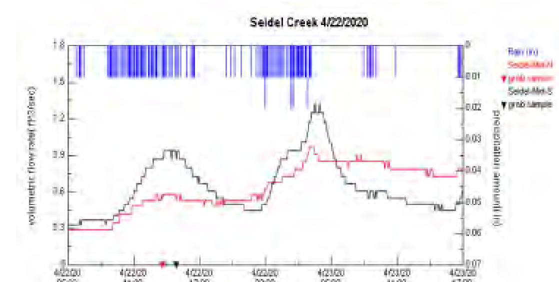


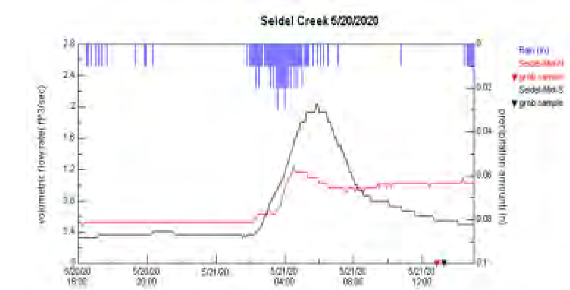


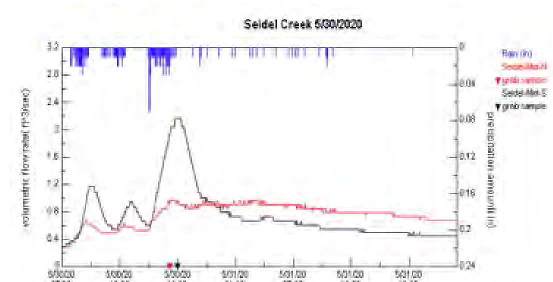


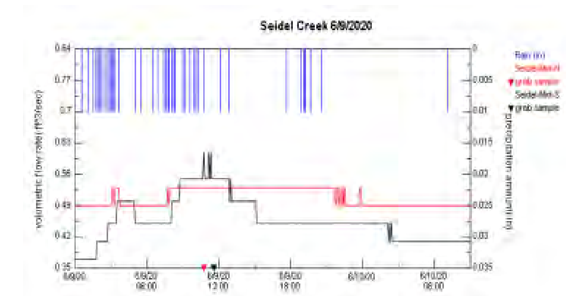


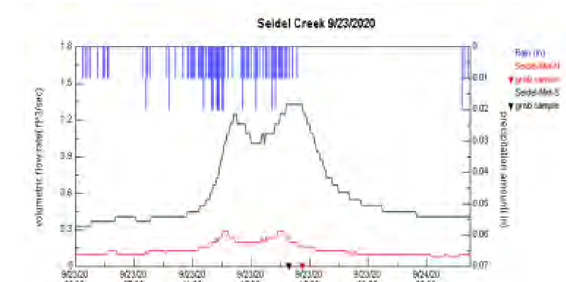






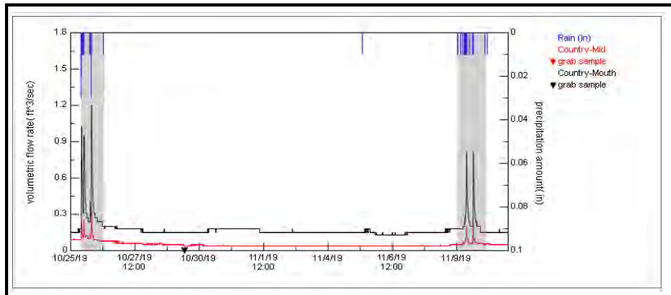


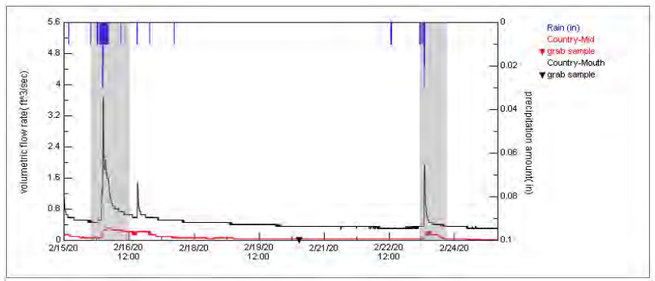


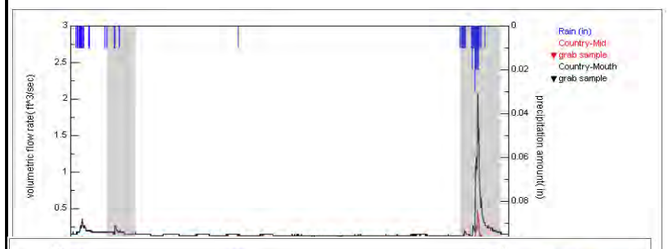


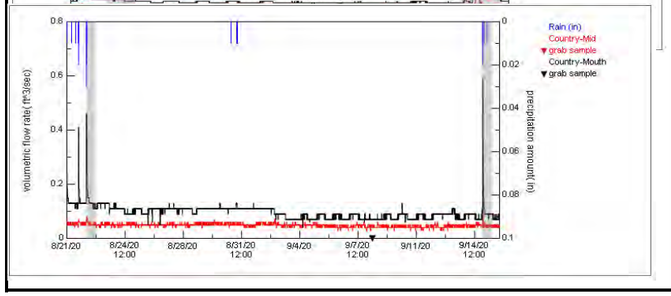
Country – Application Watershed – Sampled Hydrographs

Base Flow

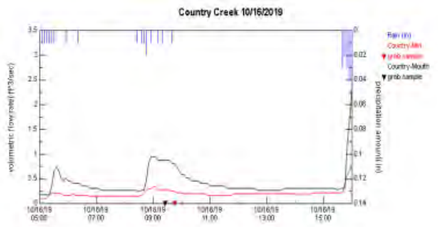


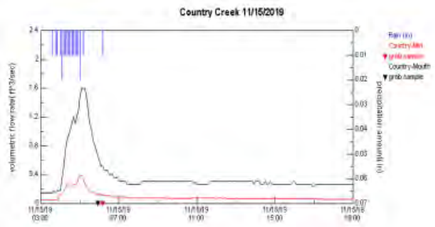


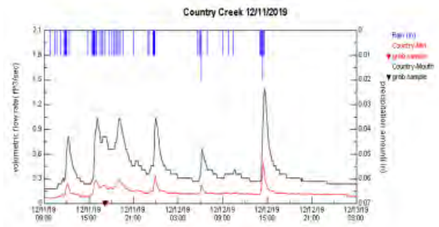


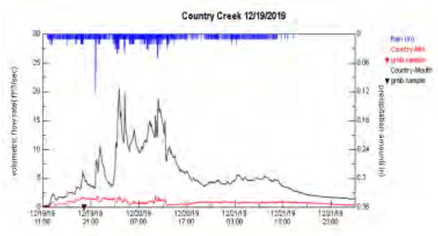


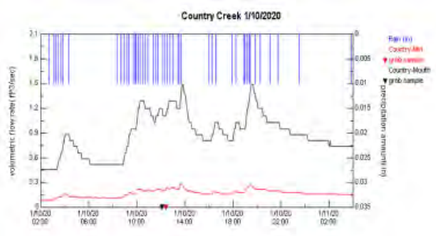
Storm Flow

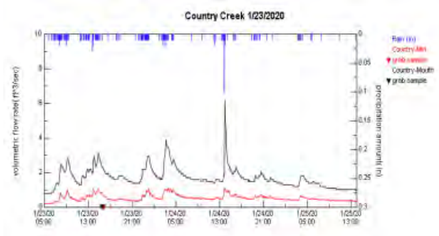


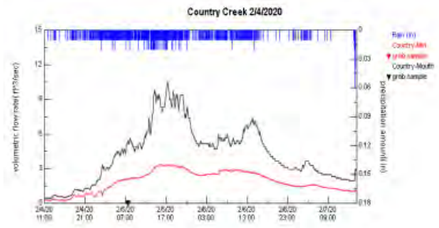


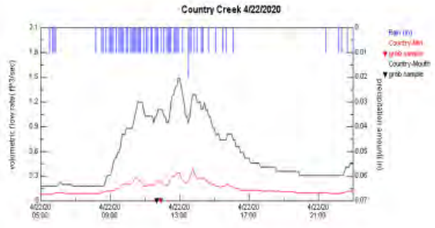


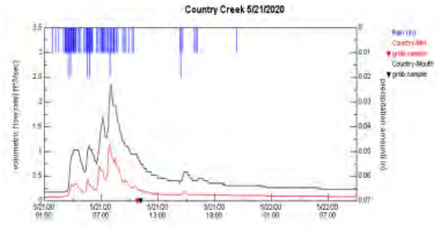


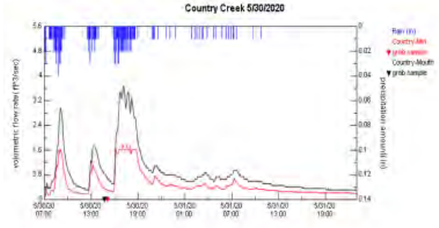


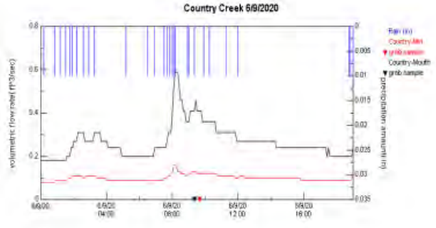


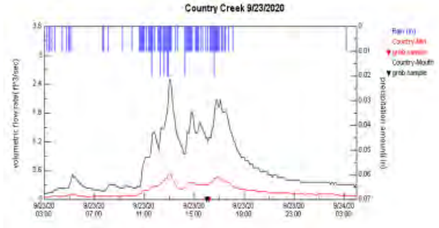






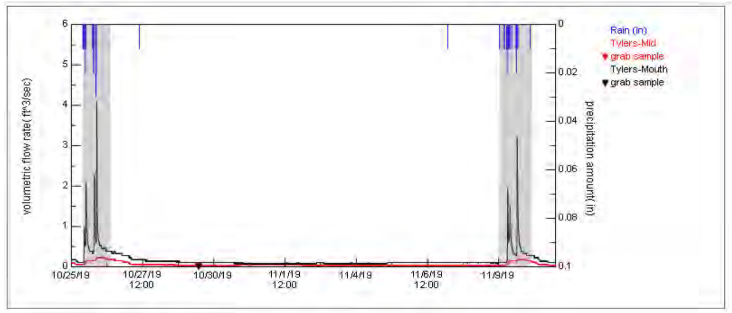


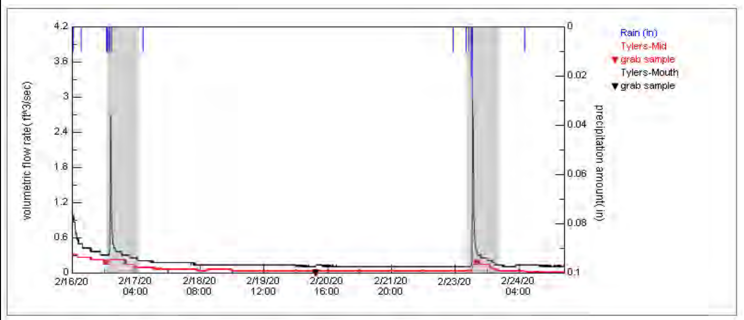


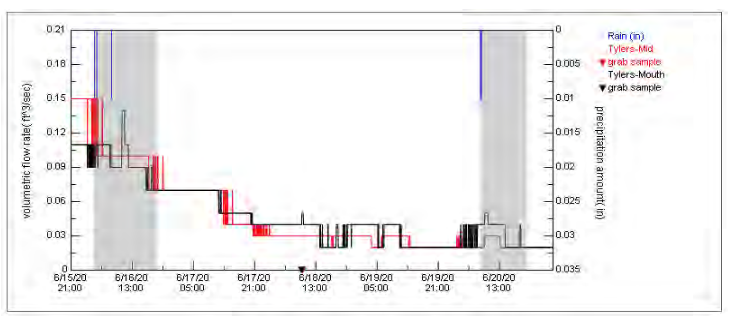


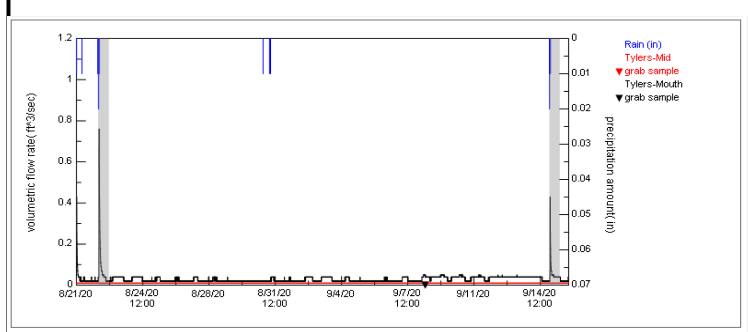
Tyler's – Application Watershed – Sampled Hydrographs

Base Flow

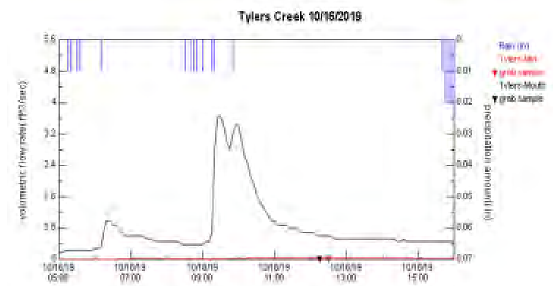


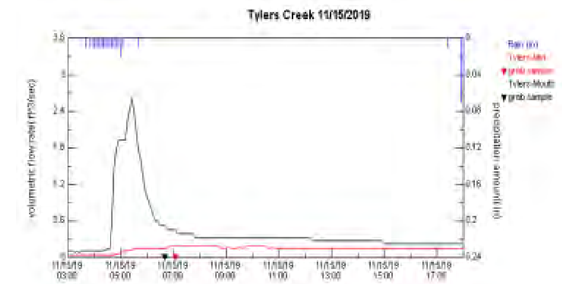


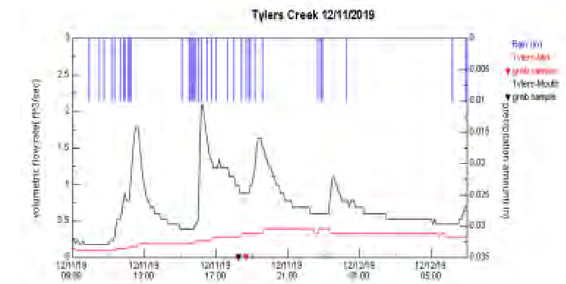


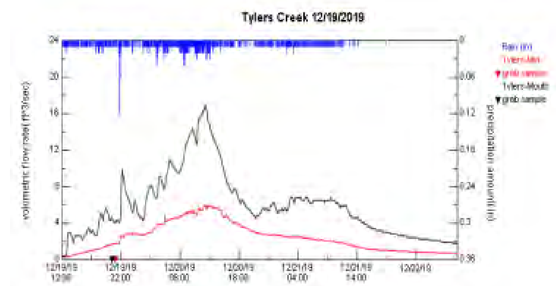


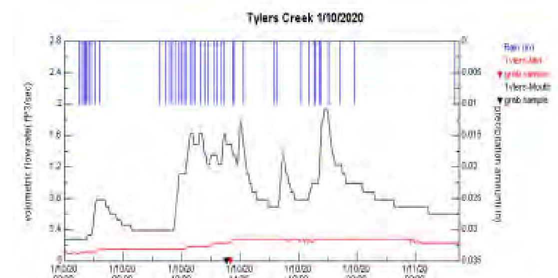
Storm Flow

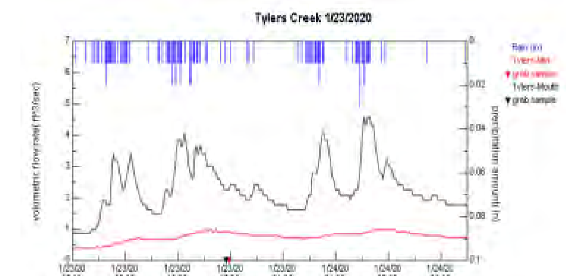


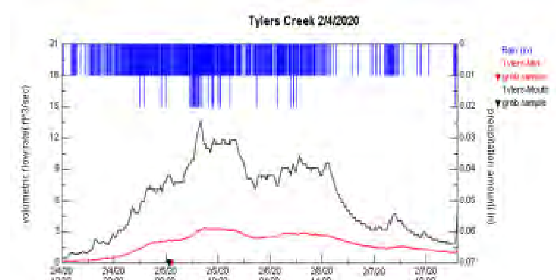


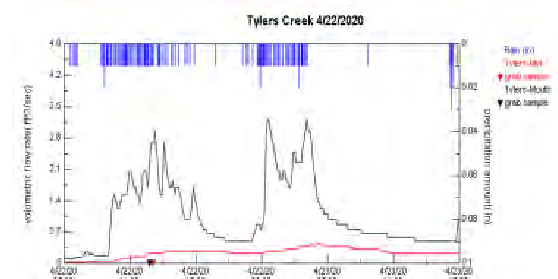


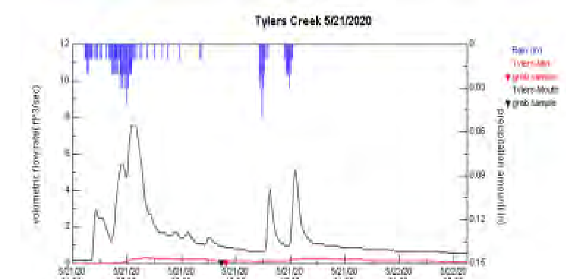


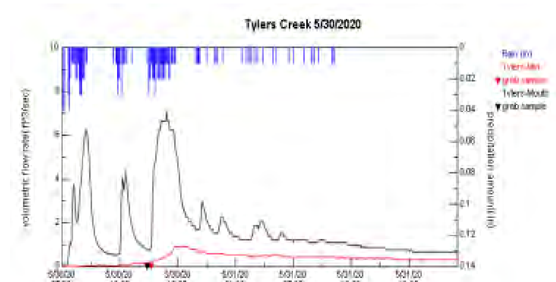


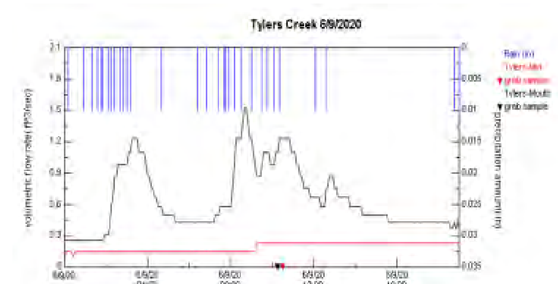


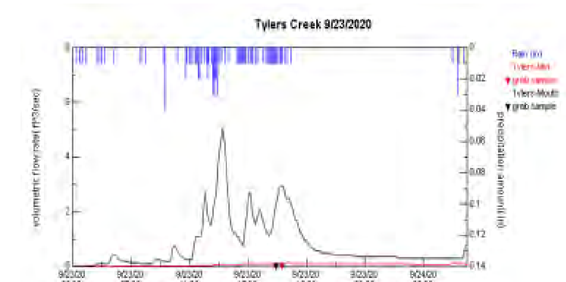












APPENDIX F

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 5, 2019

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1910-217

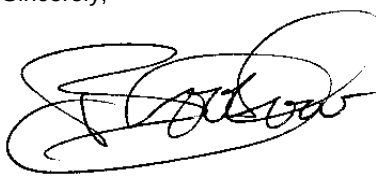
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on October 16, 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: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
Project: 14-05806-000

Case Narrative

Samples were collected on October 16, 2019 and received by the laboratory on October 16, 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: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
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-20191016**					
Laboratory ID:	10-217-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**COUMI-20191016**					
Laboratory ID:	10-217-02					
Total Suspended Solids	**170**	2.5	SM 2540D	10-18-19	10-21-19	
Client ID:	**COUMO-20191016**					
Laboratory ID:	10-217-03					
Total Suspended Solids	**7.0**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**EVAMS-20191016**					
Laboratory ID:	10-217-04					
Total Suspended Solids	**3.4**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**EVALSS-20191016**					
Laboratory ID:	10-217-05					
Total Suspended Solids	**12**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**MONMN-20191016**					
Laboratory ID:	10-217-06					
Total Suspended Solids	**4.2**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**MONMS-20191016**					
Laboratory ID:	10-217-07					
Total Suspended Solids	**9.0**	1.0	SM 2540D	10-18-19	10-21-19	

Date of Report: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
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-20191016**					
Laboratory ID:	10-217-08					
Total Suspended Solids	**1.4**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**SEIMN-20191016**					
Laboratory ID:	10-217-09					
Total Suspended Solids	**23**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**SEIMS-20191016**					
Laboratory ID:	10-217-10					
Total Suspended Solids	**8.6**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**TOSMI-20191016**					
Laboratory ID:	10-217-11					
Total Suspended Solids	**68**	2.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**TOSMO-20191016**					
Laboratory ID:	10-217-12					
Total Suspended Solids	**12**	1.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**TYLMI-20191016**					
Laboratory ID:	10-217-13					
Total Suspended Solids	**15**	2.0	SM 2540D	10-18-19	10-21-19	
Client ID:	**TYLMO-20191016**					
Laboratory ID:	10-217-14					
Total Suspended Solids	**4.6**	1.0	SM 2540D	10-18-19	10-21-19	

Date of Report: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
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:	**QA74-20191016**					
Laboratory ID:	10-217-15					
Total Suspended Solids	**190**	2.5	SM 2540D	10-18-19	10-21-19	

Date of Report: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
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:	MB1018W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-18-19	10-21-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-217-02								
	ORIG	DUP							
Total Suspended Solids	**168**	**179**	NA	NA	NA	NA	6	23	
SPIKE BLANK									
Laboratory ID:	SB1018W2								
	SB		SB		SB				
Total Suspended Solids	**88.0**		100	NA	88	69-122	NA	NA	

Date of Report: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20191016**					
Laboratory ID:	10-217-01					
Turbidity	**1.0**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**COUMI-20191016**					
Laboratory ID:	10-217-02					
Turbidity	**59**	0.20	EPA 180.1	10-17-19	10-17-19	
Client ID:	**COUMO-20191016**					
Laboratory ID:	10-217-03					
Turbidity	**4.9**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**EVAMS-20191016**					
Laboratory ID:	10-217-04					
Turbidity	**1.4**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**EVALSS-20191016**					
Laboratory ID:	10-217-05					
Turbidity	**4.9**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**MONMN-20191016**					
Laboratory ID:	10-217-06					
Turbidity	**2.2**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**MONMS-20191016**					
Laboratory ID:	10-217-07					
Turbidity	**1.4**	0.10	EPA 180.1	10-17-19	10-17-19	

Date of Report: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20191016**					
Laboratory ID:	10-217-08					
Turbidity	**1.8**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**SEIMN-20191016**					
Laboratory ID:	10-217-09					
Turbidity	**6.1**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**SEIMS-20191016**					
Laboratory ID:	10-217-10					
Turbidity	**2.8**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**TOSMI-20191016**					
Laboratory ID:	10-217-11					
Turbidity	**23**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**TOSMO-20191016**					
Laboratory ID:	10-217-12					
Turbidity	**6.7**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**TYLMI-20191016**					
Laboratory ID:	10-217-13					
Turbidity	**5.3**	0.10	EPA 180.1	10-17-19	10-17-19	
Client ID:	**TYLMO-20191016**					
Laboratory ID:	10-217-14					
Turbidity	**3.9**	0.10	EPA 180.1	10-17-19	10-17-19	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA74-20191016**					
Laboratory ID:	10-217-15					
Turbidity	**72**	0.50	EPA 180.1	10-17-19	10-17-19	

Date of Report: November 5, 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:	MB1017W1					
Turbidity	**ND**	0.10	EPA 180.1	10-17-19	10-17-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-217-01								
	ORIG	DUP							
Turbidity	**1.04**	**1.02**	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-20191016**					
Laboratory ID:	10-217-01					
Hardness	**14**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**COUMI-20191016**					
Laboratory ID:	10-217-02					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**COUMO-20191016**					
Laboratory ID:	10-217-03					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**EVAMS-20191016**					
Laboratory ID:	10-217-04					
Hardness	**95**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**EVALSS-20191016**					
Laboratory ID:	10-217-05					
Hardness	**90**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**MONMN-20191016**					
Laboratory ID:	10-217-06					
Hardness	**95**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**MONMS-20191016**					
Laboratory ID:	10-217-07					
Hardness	**140**	5.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	

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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-20191016**					
Laboratory ID:	10-217-08					
Hardness	**98**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**SEIMN-20191016**					
Laboratory ID:	10-217-09					
Hardness	**43**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**SEIMS-20191016**					
Laboratory ID:	10-217-10					
Hardness	**52**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**TOSMI-20191016**					
Laboratory ID:	10-217-11					
Hardness	**41**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**TOSMO-20191016**					
Laboratory ID:	10-217-12					
Hardness	**93**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**TYLMI-20191016**					
Laboratory ID:	10-217-13					
Hardness	**87**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	
Client ID:	**TYLMO-20191016**					
Laboratory ID:	10-217-14					
Hardness	**49**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	

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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:	**QA74-20191016**					
Laboratory ID:	10-217-15					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	

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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:	MB1021WH3					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	10-21-19	10-22-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-217-01										
	ORIG	DUP									
Hardness	**13.8**	**14.6**	NA		NA	NA		NA	6	20	
MATRIX SPIKES											
Laboratory ID:	10-217-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**141**	**138**	132	132	13.8	96	94	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB1021WH3										
	SB		SB			SB					
Hardness	**125**		132		NA	95		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-20191016**					
Laboratory ID:	10-217-01					
Dissolved Organic Carbon	**14**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**COUMI-20191016**					
Laboratory ID:	10-217-02					
Dissolved Organic Carbon	**9.6**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**COUMO-20191016**					
Laboratory ID:	10-217-03					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**EVAMS-20191016**					
Laboratory ID:	10-217-04					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**EVALSS-20191016**					
Laboratory ID:	10-217-05					
Dissolved Organic Carbon	**3.7**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**MONMN-20191016**					
Laboratory ID:	10-217-06					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**MONMS-20191016**					
Laboratory ID:	10-217-07					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	10-21-19	10-21-19	

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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-20191016**					
Laboratory ID:	10-217-08					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**SEIMN-20191016**					
Laboratory ID:	10-217-09					
Dissolved Organic Carbon	**3.7**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**SEIMS-20191016**					
Laboratory ID:	10-217-10					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**TOSMI-20191016**					
Laboratory ID:	10-217-11					
Dissolved Organic Carbon	**9.4**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**TOSMO-20191016**					
Laboratory ID:	10-217-12					
Dissolved Organic Carbon	**6.8**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**TYLMI-20191016**					
Laboratory ID:	10-217-13					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	10-21-19	10-21-19	
Client ID:	**TYLMO-20191016**					
Laboratory ID:	10-217-14					
Dissolved Organic Carbon	**6.7**	1.0	SM 5310B	10-21-19	10-21-19	

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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:	**QA74-20191016**					
Laboratory ID:	10-217-15					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	10-21-19	10-21-19	

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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:	MB1021D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	10-21-19	10-21-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-203-02								
	ORIG	DUP							
Dissolved Organic Carbon	**9.18**	**9.46**	NA	NA	NA	NA	3	15	
MATRIX SPIKE									
Laboratory ID:	10-203-02								
	MS		MS		MS				
Dissolved Organic Carbon	**18.9**		10.0	9.18	97	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1021D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.4**		10.0	NA	104	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-20191016**					
Laboratory ID:	10-217-01					
Total Phosphorus	**ND**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**COUMI-20191016**					
Laboratory ID:	10-217-02					
Total Phosphorus	**0.40**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**COUMO-20191016**					
Laboratory ID:	10-217-03					
Total Phosphorus	**0.082**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**EVAMS-20191016**					
Laboratory ID:	10-217-04					
Total Phosphorus	**0.017**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**EVALSS-20191016**					
Laboratory ID:	10-217-05					
Total Phosphorus	**0.030**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**MONMN-20191016**					
Laboratory ID:	10-217-06					
Total Phosphorus	**0.053**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**MONMS-20191016**					
Laboratory ID:	10-217-07					
Total Phosphorus	**0.34**	0.010	EPA 365.1	10-22-19	10-23-19	

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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-20191016**					
Laboratory ID:	10-217-08					
Total Phosphorus	**0.035**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**SEIMN-20191016**					
Laboratory ID:	10-217-09					
Total Phosphorus	**0.068**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**SEIMS-20191016**					
Laboratory ID:	10-217-10					
Total Phosphorus	**0.037**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**TOSMI-20191016**					
Laboratory ID:	10-217-11					
Total Phosphorus	**0.15**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**TOSMO-20191016**					
Laboratory ID:	10-217-12					
Total Phosphorus	**0.082**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**TYLMI-20191016**					
Laboratory ID:	10-217-13					
Total Phosphorus	**0.040**	0.010	EPA 365.1	10-22-19	10-23-19	
Client ID:	**TYLMO-20191016**					
Laboratory ID:	10-217-14					
Total Phosphorus	**0.046**	0.010	EPA 365.1	10-22-19	10-23-19	

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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:	**QA74-20191016**					
Laboratory ID:	10-217-15					
Total Phosphorus	**0.37**	0.010	EPA 365.1	10-22-19	10-23-19	

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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:	MB1022W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	10-22-19	10-23-19	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	10-217-01							
	ORIG DUP							
Total Phosphorus	**ND** **ND**	NA	NA	NA	NA	NA	14	
MATRIX SPIKE								
Laboratory ID:	10-217-01							
	MS	MS		MS				
Total Phosphorus	**0.257**	0.250	ND	103	79-113	NA	NA	
SPIKE BLANK								
Laboratory ID:	SB1022W1							
	SB	SB		SB				
Total Phosphorus	**0.241**	0.250	NA	96	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-20191016**					
Laboratory ID:	10-217-01					
Copper	**ND**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**COUMI-20191016**					
Laboratory ID:	10-217-02					
Copper	**9.3**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**64**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**COUMO-20191016**					
Laboratory ID:	10-217-03					
Copper	**2.8**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**470**	13	EPA 200.8	10-21-19	10-21-19	
Client ID:	**EVAMS-20191016**					
Laboratory ID:	10-217-04					
Copper	**ND**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**EVALSS-20191016**					
Laboratory ID:	10-217-05					
Copper	**1.3**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**MONMN-20191016**					
Laboratory ID:	10-217-06					
Copper	**ND**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**MONMS-20191016**					
Laboratory ID:	10-217-07					
Copper	**1.2**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	

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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-20191016**					
Laboratory ID:	10-217-08					
Copper	**1.0**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**7.8**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**SEIMN-20191016**					
Laboratory ID:	10-217-09					
Copper	**1.5**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**SEIMS-20191016**					
Laboratory ID:	10-217-10					
Copper	**ND**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**TOSMI-20191016**					
Laboratory ID:	10-217-11					
Copper	**13**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**120**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**TOSMO-20191016**					
Laboratory ID:	10-217-12					
Copper	**3.6**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**18**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**TYLMI-20191016**					
Laboratory ID:	10-217-13					
Copper	**8.1**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**22**	5.0	EPA 200.8	10-21-19	10-21-19	
Client ID:	**TYLMO-20191016**					
Laboratory ID:	10-217-14					
Copper	**7.1**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**12**	5.0	EPA 200.8	10-21-19	10-21-19	

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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:	**QA74-20191016**					
Laboratory ID:	10-217-15					
Copper	**9.3**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**64**	5.0	EPA 200.8	10-21-19	10-21-19	

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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:	MB1021WH2					
Copper	**ND**	1.0	EPA 200.8	10-21-19	10-21-19	
Zinc	**ND**	5.0	EPA 200.8	10-21-19	10-21-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-217-05										
	ORIG	DUP									
Copper	**1.30**	**1.28**	NA	NA		NA		NA	1	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-217-05										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**94.0**	**97.4**	100	100	1.30	**93**	**96**	75-125	4	20	
Zinc	**94.0**	**98.2**	100	100	ND	**94**	**98**	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-20191016**					
Laboratory ID:	10-217-01					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**COUMI-20191016**					
Laboratory ID:	10-217-02					
Copper	**2.5**	1.0	EPA 200.8		10-21-19	
Zinc	**8.4**	5.0	EPA 200.8		10-21-19	
Client ID:	**COUMO-20191016**					
Laboratory ID:	10-217-03					
Copper	**1.9**	1.0	EPA 200.8		10-21-19	
Zinc	**470**	13	EPA 200.8		10-21-19	
Client ID:	**EVAMS-20191016**					
Laboratory ID:	10-217-04					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**EVALSS-20191016**					
Laboratory ID:	10-217-05					
Copper	**1.3**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**MONMN-20191016**					
Laboratory ID:	10-217-06					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**MONMS-20191016**					
Laboratory ID:	10-217-07					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	

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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:	**MONM-20191016**					
Laboratory ID:	10-217-08					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**SEIMN-20191016**					
Laboratory ID:	10-217-09					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**SEIMS-20191016**					
Laboratory ID:	10-217-10					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**TOSMI-20191016**					
Laboratory ID:	10-217-11					
Copper	**5.8**	1.0	EPA 200.8		10-21-19	
Zinc	**37**	5.0	EPA 200.8		10-21-19	
Client ID:	**TOSMO-20191016**					
Laboratory ID:	10-217-12					
Copper	**2.3**	1.0	EPA 200.8		10-21-19	
Zinc	**12**	5.0	EPA 200.8		10-21-19	
Client ID:	**TYLMI-20191016**					
Laboratory ID:	10-217-13					
Copper	**4.1**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	
Client ID:	**TYLMO-20191016**					
Laboratory ID:	10-217-14					
Copper	**5.5**	1.0	EPA 200.8		10-21-19	
Zinc	**6.6**	5.0	EPA 200.8		10-21-19	

Date of Report: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
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:	**QA74-20191016**					
Laboratory ID:	10-217-15					
Copper	**2.4**	1.0	EPA 200.8		10-21-19	
Zinc	**8.3**	5.0	EPA 200.8		10-21-19	

Date of Report: November 5, 2019
Samples Submitted: October 16, 2019
Laboratory Reference: 1910-217
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:	MB1021D2					
Copper	**ND**	1.0	EPA 200.8		10-21-19	
Zinc	**ND**	5.0	EPA 200.8		10-21-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-217-15										
	ORIG	DUP									
Copper	**2.40**	**2.44**	NA	NA		NA		NA	2	20	
Zinc	**8.32**	**8.64**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	10-217-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**75.6**	**76.2**	80.0	80.0	2.40	**92**	**92**	75-125	1	20	
Zinc	**83.6**	**85.0**	80.0	80.0	8.32	**94**	**96**	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

Dec 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-20191016	Water	19-A017037	Micro, NUT
COUMI-20191016	Water	19-A017038	Micro, NUT
COUMO-20191016	Water	19-A017039	Micro, NUT
EVAMS-20191016	Water	19-A017040	Micro, NUT
EVALSS-20191016	Water	19-A017041	Micro, NUT
MONMN-20191016	Water	19-A017042	Micro, NUT
MONMS-20191016	Water	19-A017043	Micro, NUT
MONM-20191016	Water	19-A017044	Micro, NUT
SEIMN-20191016	Water	19-A017045	Micro, NUT
SEIMS-20191016	Water	19-A017046	Micro, NUT
TOSMI-20191016	Water	19-A017047	Micro, NUT
TOSMO-20191016	Water	19-A017048	Micro, NUT
TYLMI-20191016	Water	19-A017049	Micro, NUT
TYLMO-20191016	Water	19-A017050	Micro, NUT
QA74-20191016	Water	19-A017051	Micro, NUT

Your samples were received on Thursday, October 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

Dec 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: 10-217

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

Am Test Inc.
13600 NE 126TH PL
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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: 10-217
All results reported on an as received basis.

Date Received: 10/17/19
Date Reported: 12/ 4/19

AMTEST Identification Number **19-A017037**
Client Identification **COLM-20191016**
Sampling Date **10/16/19, 15:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	16.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.79	mg/l		0.1			
Total Nitrogen (TKN)	0.723	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.067	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017038**
Client Identification **COUMI-20191016**
Sampling Date **10/16/19, 10:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	860	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	1.81	mg/l		0.1			
Total Nitrogen (TKN)	1.29	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.52	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017039**
Client Identification **COUMO-20191016**
Sampling Date **10/16/19, 10:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	70.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.82	mg/l		0.1			
Total Nitrogen (TKN)	0.515	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.30	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017040**
Client Identification **EVAMS-20191016**
Sampling Date **10/16/19, 12:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	60.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	2.68	mg/l		0.1			
Total Nitrogen (TKN)	0.779	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	1.9	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017041**
Client Identification **EVALSS-20191016**
Sampling Date **10/16/19, 12:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	82.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	1.79	mg/l		0.1			
Total Nitrogen (TKN)	0.592	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	1.2	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017042**
Client Identification **MONMN-20191016**
Sampling Date **10/16/19, 13:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	900	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.39	mg/l		0.1			
Total Nitrogen (TKN)	0.386	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017043**
Client Identification **MONMS-20191016**
Sampling Date **10/16/19, 14:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	38.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.654	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.026	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017044**
Client Identification **MONM-20191016**
Sampling Date **10/16/19, 14:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.69	mg/l		0.1			
Total Nitrogen (TKN)	0.442	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.25	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017045**
Client Identification **SEIMN-20191016**
Sampling Date **10/16/19, 15:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	13.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.41	mg/l		0.1			
Total Nitrogen (TKN)	0.299	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.11	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017046**
Client Identification **SEIMS-20191016**
Sampling Date **10/16/19, 14:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	24.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.419	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017047**
Client Identification **TOSMI-20191016**
Sampling Date **10/16/19, 11:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	860	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	1.38	mg/l		0.1			
Total Nitrogen (TKN)	1.01	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.37	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017048**
Client Identification **TOSMO-20191016**
Sampling Date **10/16/19, 11:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	1.33	mg/l		0.1			
Total Nitrogen (TKN)	0.828	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.50	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017049**
Client Identification **TYLMI-20191016**
Sampling Date **10/16/19, 13:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	76.	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	1.44	mg/l		0.1			
Total Nitrogen (TKN)	0.576	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.86	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017050**
Client Identification **TYLMO-20191016**
Sampling Date **10/16/19, 13:15**

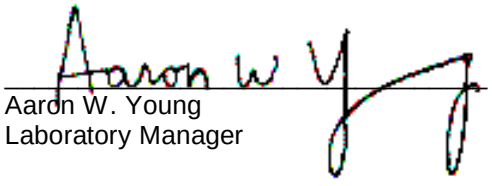
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	440	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.527	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.21	mg/l		0.02	SM4500NO3	SH	10/28/19

AMTEST Identification Number **19-A017051**
Client Identification **QA74-20191016**
Sampling Date **10/16/19, 10:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	760	CFU/100 ml		1	SM 9222D	AG	10/17/19
Total Nitrogen (NOX&TKN)	1.88	mg/l		0.1			
Total Nitrogen (TKN)	1.38	mg/l		0.2	SM4500N	SH	10/23/19
Total Nitrate + Nitrite	0.50	mg/l		0.02	SM4500NO3	SH	10/28/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
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Professional Analytical Services

QC Summary for sample numbers: 19-A017037 to 19-A017051

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A017043	Fecal coliform	CFU/100 ml	38.	32.	17.
19-A017049	Fecal coliform	CFU/100 ml	76.	84.	10.
19-A017088	Fecal coliform	CFU/100 ml	40.	25.	46.
19-A016952	Total Nitrogen (TKN)	mg/l	0.551	0.568	3.0
19-A017045	Total Nitrogen (TKN)	mg/l	0.299	0.298	0.34
19-A017051	Total Nitrogen (TKN)	mg/l	1.38	1.50	8.3
19-A016951	Total Nitrate + Nitrite	mg/l	0.60	0.68	12.
19-A016952	Total Nitrate + Nitrite	mg/l	2.1	2.1	0.00
19-A017045	Total Nitrate + Nitrite	mg/l	0.11	0.13	17.
19-A017131	Total Nitrate + Nitrite	mg/l	2.7	2.6	3.8
19-A017141	Total Nitrate + Nitrite	mg/l	0.28	0.25	11.
19-A017330	Total Nitrate + Nitrite	mg/l	0.14	0.15	6.9

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A016952	Total Nitrogen (TKN)	mg/l	0.551	2.51	2.00	97.95 %
19-A017045	Total Nitrogen (TKN)	mg/l	0.299	2.19	2.00	94.55 %
19-A017051	Total Nitrogen (TKN)	mg/l	1.38	3.42	2.00	102.00 %
19-A016951	Total Nitrate + Nitrite	mg/l	0.60	1.4	1.0	80.00 %
19-A016952	Total Nitrate + Nitrite	mg/l	2.1	3.0	1.0	90.00 %
19-A017045	Total Nitrate + Nitrite	mg/l	0.11	1.1	1.0	99.00 %
19-A017131	Total Nitrate + Nitrite	mg/l	2.7	3.7	1.0	100.00 %
19-A017141	Total Nitrate + Nitrite	mg/l	0.28	1.2	1.0	92.00 %
19-A017330	Total Nitrate + Nitrite	mg/l	0.14	1.1	1.0	96.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.03	103. %
Total Nitrogen (TKN)	mg/l	1.00	0.999	99.9 %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %
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
Total Nitrogen (TKN)	mg/l	< 0.2

QC Summary for sample numbers: 19-A017037 to 19-A017051...

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

OnSite Environmental Inc.

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

Laboratory Reference #: 10-217

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-20191016 17037	10/16/19	15:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20191016 38	10/16/19	10:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20191016 39	10/16/19	10:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20191016 40	10/16/19	12:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20191016 41	10/16/19	12:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20191016 42	10/16/19	13:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20191016 43	10/16/19	14:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20191016 44	10/16/19	14:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20191016 45	10/16/19	15:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20191016 46	10/16/19	14:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:		OnSite Env	10/17/19	825	
Received by:		AmTest	10/17/19	825	
Relinquished by:					
Received by:					
Relinquished by:					
Received by:					

EDDs - CSV

Reporting Limits:

Fecal Coliform - 1.0 cfu/100ml

Total Nitrogen - .10 mg/L

T=1.8

OnSite Environmental Inc.

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

Laboratory Reference #: 10-217

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-20191016 17047	10/16/19	11:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20191016 48	10/16/19	11:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20191016 49	10/16/19	13:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20191016 50	10/16/19	13:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA74-20191016 51	10/16/19	10:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	10/17/19	825	EDDs - CSV
Received by:	AmTest	10/17/19	825	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

T=18

CHAIN OF CUSTODY

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

Page 1 of 1

Laboratory No. 10-217

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 1016	10.16.19	15:50	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 1016		10:45	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 1016		10:25	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 1016		12:10	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 1016		12:25	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 1016		13:50	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 1016		14:00	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 1016		16:30	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 1016		15:25	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 1016		14:30	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 1016		11:40	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 1016		11:15	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 1016		13:30	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 1016		13:15	Water	7	X	X	X	X	X	X	X	X	X			
15	QA74-2019 1016		10:55	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by M. Mullen Date 10.16.19 Received by _____ Date 10/16/19
Firm Herrera Time 16:55 Firm OSE Time 1655
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. 10-217

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-2019 1016 **	10.16.19	15:50	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 1016		10:45	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 1016		10:25	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 1016		12:10	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 1016		12:25	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 1016		13:50	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 1016		14:00	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 1016 **		~~14:50~~ 16:30	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 1016 **		~~15:50~~ 15:15	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 1016		14:30	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 1016		11:46	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 1016		11:15	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 1016		13:30	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 1016		13:15	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 74-2019 1016	↓	10:55	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by M. Mullen Date 10.16.19 Received by _____ Date 10/16/19
Firm Herrera Time 16:55 Firm OSE Time 1655

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

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

** - time edits 10.17.19 by meghan mullen

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	MM + ML
Meter:	YSI Pro DSS #2
Date/Time:	10.15.19 @ 11:15
Barometric Pressure Start of Day:	mmHg: 765.0 Time: 11:15
Barometric Pressure End of Day:	mmHg: 756.9 Time: 8:10 am - 10.17.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.6	0	23.3	Herrera DI water
Conductivity (µS/cm)	1012 / 1000	1,000	23.4	1000 uS Conductivity Standard Solution → calibrated
Conductivity (µS/cm)	100.3	100	23.2	100 µS solution
DO % Saturation	100	100	22.5	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	23.2	Herrera DI water
Conductivity (µS/cm)	100.9	100	13.3	
DO % Saturation	99.8	100	15.1	

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 INL

Sample Date: 20191016 **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: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy 60°

Water Quality Sampling

Sample ID: COLM-20191016

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: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leith **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 X

Stream Stage Measurement

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

Stream Stage (ft): 5.48

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.4°

Specific Conductivity (µs/cm) 46.4

Dissolved Oxygen (mg/L) 9.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NLI MM

Sample Date: 10 16 2019 **Sample Time:** 10:45 PDT: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 10:50 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: 58° Rainy

Water Quality Sampling

Sample ID: COUMI-20191016

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: QA74-20191016

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Turbid

Color: Brown

Odor: NIA

Sheen: NIA

Floatables: Foamy

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leuth **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 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) 11.0

Specific Conductivity (µs/cm) 203.2

Dissolved Oxygen (mg/L) 10.58

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM NL

Sample Date: 10.16.19 **Sample Time:** 10:25 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 10:30 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: 55° rainy

Water Quality Sampling

Sample ID: COUMO - 20191016

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:	some bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **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 X

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) 11.4

Specific Conductivity (µs/cm) 268.2

Dissolved Oxygen (mg/L) 10.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NL

Sample Date: 10/6/19 **Sample Time:** 1210 PDT: X

Base Flow or Storm Event? Base **Field Filtered Time:** 1215 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~~ cloudy 68°

Water Quality Sampling

Sample ID: EVAMS 20191016

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: Shannon Loutzenhiser **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 X

Stream Stage Measurement

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

Stream Stage (ft): 2.88

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.5

Specific Conductivity (µs/cm) 220.9

Dissolved Oxygen (mg/L) 10.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM NL

Sample Date: 101619 **Sample Time:** 1225 PDT: X

Base Flow or Storm Event? (circle) **Field Filtered Time:** 1230 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: cloudy 65°

Water Quality Sampling

Sample ID: EVALSS-20191016

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: [signature] **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 X

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) 10.6

Specific Conductivity (µs/cm) 202.0

Dissolved Oxygen (mg/L) 11.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM / NL

Sample Date: 2019 10 16 **Sample Time:** 1350 PDT: X

Base Flow or (Storm) Event? **Field Filtered Time:** 1355 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: Drizzle 60°

Water Quality Sampling

Sample ID: MONMN-20191016

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: John Leuth **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 X

Stream Stage Measurement

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

Stream Stage (ft): 9.12

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.3

Specific Conductivity (µs/cm) 222.0

Dissolved Oxygen (mg/L) 9.78

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM / NL

Sample Date: 20191016 **Sample Time:** 1400 PDT: X

Base Flow or Storm Event? (B) **Field Filtered Time:** 1405 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: Cloudy 60°

Water Quality Sampling

Sample ID: MONMS20191016

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: Ethan Lentz **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 X

Stream Stage Measurement

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

Stream Stage (ft): 6.80

Reference Point (description): Top of PVC pipe down

Water Quality Measurments

Temperature (°C) 11.6

Specific Conductivity (µs/cm) 361.7

Dissolved Oxygen (mg/L) ~~AM~~ 8.17

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/MM

Sample Date: 20191016 **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: MONM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy 60°

Water Quality Sampling

Sample ID: MONM-20191016

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:**

Quality Assurance

Checked By: John Leuth **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 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) 11.6

Specific Conductivity (µs/cm) 240.3

Dissolved Oxygen (mg/L) 10.40

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/MM

Sample Date: 2019 10 16 **Sample Time:** 15:15 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 15:20 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: cloudy 60°

Water Quality Sampling

Sample ID: SEIMN20191016

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 Lenth **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 X

Stream Stage Measurement

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

Stream Stage (ft): 0.69

Reference Point (description): top of bolt on sidedrum

Water Quality Measurments

Temperature (°C) 10.6

Specific Conductivity (µs/cm) 102.7

Dissolved Oxygen (mg/L) 10.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/MM

Sample Date: 20191016 **Sample Time:** 1430 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1435 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: Cloudy 60°

Water Quality Sampling

Sample ID: SEIMS-20191016

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: NIA

Odor: NIA

Sheen: NIA

Floatables: NIA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lantz **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 X

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) 10.4°

Specific Conductivity (µs/cm) ~~MMMM~~ 112.60

Dissolved Oxygen (mg/L) 10.40

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/MM

Sample Date: 10/6/2019 **Sample Time:** 1146 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1145 PST:

(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: drizzle 60°

Water Quality Sampling

Sample ID: TOSM1-20191016

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: S. Lanthier **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 X

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) 12.2

Specific Conductivity (µs/cm) 187.9

Dissolved Oxygen (mg/L) 10.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/MM

Sample Date: 2019.10.16 **Sample Time:** 11:15 PDT: X

Base Flow or Storm Event? (S) **Field Filtered Time:** 11:20 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: rainy 55°

Water Quality Sampling

Sample ID: TOSMO-20191016

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: some bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Silva Lentz **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 X

Stream Stage Measurement

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

Stream Stage (ft): 0.66

Reference Point (description): SB

Water Quality Measurments

Temperature (°C) 11.00

Specific Conductivity (µs/cm) 375.6

Dissolved Oxygen (mg/L) 10.78

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM / NL

Sample Date: 2019 10 16 **Sample Time:** 1330 PDT: X

Base Flow or (Storm) Event? **Field Filtered Time:** 1335 PST:

(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: cloudy 60°

Water Quality Sampling

Sample ID: TYLM1-20191016

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: leaf litter

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lauth **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 X

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 down

Water Quality Measurments

Temperature (°C) 12.9°

Specific Conductivity (µs/cm) 197.1

Dissolved Oxygen (mg/L) 9.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NL

Sample Date: 101619 **Sample Time:** 1315 PDT: X

Base Flow or Storm Event? Base **Field Filtered Time:** 1320 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: cloudy 60°

Water Quality Sampling

Sample ID: TYLMO-20191016

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: **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): 2.77

Reference Point (description): Top of culvert down

Water Quality Measurments

Temperature (°C) 12.0°

Specific Conductivity (µs/cm) 129.8

Dissolved Oxygen (mg/L) 10.22

Multiple alder trees cleared on both sides of bank.

Data Quality Assurance Worksheet

By N. Maas

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

Date 12/4/19 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 GC

Sample Date/Sample ID: 10/16/2019 /All locations, QA74 (COUMI) Lab Ref No 1910-217

date 12/10/19

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**	88	**±20**	6	**≤ 25**	11	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	2	**≤ 25**	20	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	5	**≤180**	≤1.0 mg/L 1.0 mg/L	96,94	**±25**	95	**±15**	6,2	**≤ 20**	12.6	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	5	**≤15**	5	**≤28**	≤1.0 mg/L 1.0 mg/L	97	**±25**	104	**±15**	3	**≤ 20**	4.1	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	103	**±25**	96	**±20**	NA	**≤ 20**	7.8	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	7	**≤28**	≤0.1 mg/L 0.1 mg/L	98,95, 102	**±25**	103,100	**±20**	3.0,0.34, 8.3	**≤ 20**	6.7	**≤ 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; NR – not reported

Data Quality Assurance Worksheet

By N. Maas

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

Date 12/4/19 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 GC

Sample Date/Sample ID: 10/16/2019 /All locations, QA74 (COUMI) Lab Ref No 1910-217

date 12/10/19

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**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	93,96	**±25**	NR	**±15**	1	**≤ 20**	0	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	94,98	**±25**	NR	**±15**	NA	**≤ 20**	0	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<5	**≤15**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	92	**±25**	NR	**±15**	2	**≤ 20**	D = 0.1	**≤ 2**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<5	**≤15**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	94,96	**±25**	NR	**±15**	4	**≤ 20**	D = 0.1	**≤ 10**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	17,10,**46**	**≤ 35**	12	**≤ 50**	OK	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

November 15, 2019

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1910-378

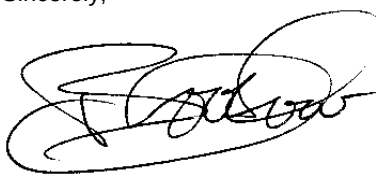
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on October 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: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
Project: 14-05806-000

Case Narrative

Samples were collected on October 29, 2019 and received by the laboratory on October 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.

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
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-20201029**					
Laboratory ID:	10-378-01					
Total Suspended Solids	**1.0**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**COUMI-20201029**					
Laboratory ID:	10-378-02					
Total Suspended Solids	**6.2**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**COUMO-20201029**					
Laboratory ID:	10-378-03					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**EVAMS-20201029**					
Laboratory ID:	10-378-04					
Total Suspended Solids	**11**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**EVALSS-20201029**					
Laboratory ID:	10-378-05					
Total Suspended Solids	**1.4**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**MONMN-20201029**					
Laboratory ID:	10-378-06					
Total Suspended Solids	**2.2**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**MONMS-20201029**					
Laboratory ID:	10-378-07					
Total Suspended Solids	**11**	1.0	SM 2540D	10-30-19	10-31-19	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
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-20201029**					
Laboratory ID:	10-378-08					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**SEIMN-20201029**					
Laboratory ID:	10-378-09					
Total Suspended Solids	**2.6**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**SEIMS-20201029**					
Laboratory ID:	10-378-10					
Total Suspended Solids	**8.4**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**TOSMI-20201029**					
Laboratory ID:	10-378-11					
Total Suspended Solids	**2.4**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**TOSMO-20201029**					
Laboratory ID:	10-378-12					
Total Suspended Solids	**12**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**TYLMI-20201029**					
Laboratory ID:	10-378-13					
Total Suspended Solids	**3.2**	1.0	SM 2540D	10-30-19	10-31-19	
Client ID:	**TYLMO-20201029**					
Laboratory ID:	10-378-14					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-30-19	10-31-19	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
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:	**QA75-20201029**					
Laboratory ID:	10-378-15					
Total Suspended Solids	**2.6**	1.0	SM 2540D	10-30-19	10-31-19	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
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:	MB1030W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	10-30-19	10-31-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-378-11								
	ORIG	DUP							
Total Suspended Solids	**2.40**	**2.80**	NA	NA	NA	NA	15	23	
SPIKE BLANK									
Laboratory ID:	SB1030W1								
	SB		SB		SB				
Total Suspended Solids	**90.0**		100	NA	90	69-122	NA	NA	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20201029**					
Laboratory ID:	10-378-01					
Turbidity	**1.5**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**COUMI-20201029**					
Laboratory ID:	10-378-02					
Turbidity	**3.2**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**COUMO-20201029**					
Laboratory ID:	10-378-03					
Turbidity	**0.94**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**EVAMS-20201029**					
Laboratory ID:	10-378-04					
Turbidity	**3.6**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**EVALSS-20201029**					
Laboratory ID:	10-378-05					
Turbidity	**1.3**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**MONMN-20201029**					
Laboratory ID:	10-378-06					
Turbidity	**1.4**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**MONMS-20201029**					
Laboratory ID:	10-378-07					
Turbidity	**3.8**	0.10	EPA 180.1	10-29-19	10-29-19	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20201029**					
Laboratory ID:	10-378-08					
Turbidity	**1.0**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**SEIMN-20201029**					
Laboratory ID:	10-378-09					
Turbidity	**1.5**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**SEIMS-20201029**					
Laboratory ID:	10-378-10					
Turbidity	**2.2**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**TOSMI-20201029**					
Laboratory ID:	10-378-11					
Turbidity	**1.1**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**TOSMO-20201029**					
Laboratory ID:	10-378-12					
Turbidity	**3.5**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**TYLMI-20201029**					
Laboratory ID:	10-378-13					
Turbidity	**1.8**	0.10	EPA 180.1	10-29-19	10-29-19	
Client ID:	**TYLMO-20201029**					
Laboratory ID:	10-378-14					
Turbidity	**1.7**	0.10	EPA 180.1	10-29-19	10-29-19	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA75-20201029**					
Laboratory ID:	10-378-15					
Turbidity	**2.0**	0.10	EPA 180.1	10-29-19	10-29-19	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
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:	MB1029W1					
Turbidity	**ND**	0.10	EPA 180.1	10-29-19	10-29-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-378-07								
	ORIG	DUP							
Turbidity	**3.81**	**3.86**	NA	NA	NA	NA	1	15	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
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-20201029**					
Laboratory ID:	10-378-01					
Hardness	**15**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**COUMI-20201029**					
Laboratory ID:	10-378-02					
Hardness	**150**	5.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**COUMO-20201029**					
Laboratory ID:	10-378-03					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**EVAMS-20201029**					
Laboratory ID:	10-378-04					
Hardness	**95**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**EVALSS-20201029**					
Laboratory ID:	10-378-05					
Hardness	**85**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**MONMN-20201029**					
Laboratory ID:	10-378-06					
Hardness	**85**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**MONMS-20201029**					
Laboratory ID:	10-378-07					
Hardness	**140**	5.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	

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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-20201029**					
Laboratory ID:	10-378-08					
Hardness	**96**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**SEIMN-20201029**					
Laboratory ID:	10-378-09					
Hardness	**28**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**SEIMS-20201029**					
Laboratory ID:	10-378-10					
Hardness	**51**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**TOSMI-20201029**					
Laboratory ID:	10-378-11					
Hardness	**120**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**TOSMO-20201029**					
Laboratory ID:	10-378-12					
Hardness	**140**	5.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**TYLMI-20201029**					
Laboratory ID:	10-378-13					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	
Client ID:	**TYLMO-20201029**					
Laboratory ID:	10-378-14					
Hardness	**91**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	

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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:	**QA75-20201029**					
Laboratory ID:	10-378-15					
Hardness	**130**	5.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	

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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:	MB1105WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	11-5-19	11-7-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-378-03										
	ORIG	DUP									
Hardness	**113**	**117**	NA		NA	NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	10-378-03										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**244**	**229**	132	132	113	99	88	75-125	6	20	
SPIKE BLANK											
Laboratory ID:	SB1105WH1										
	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-20201029**					
Laboratory ID:	10-378-01					
Dissolved Organic Carbon	**18**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**COUMI-20201029**					
Laboratory ID:	10-378-02					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**COUMO-20201029**					
Laboratory ID:	10-378-03					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**EVAMS-20201029**					
Laboratory ID:	10-378-04					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**EVALSS-20201029**					
Laboratory ID:	10-378-05					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**MONMN-20201029**					
Laboratory ID:	10-378-06					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**MONMS-20201029**					
Laboratory ID:	10-378-07					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	11-5-19	11-5-19	

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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-20201029**					
Laboratory ID:	10-378-08					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**SEIMN-20201029**					
Laboratory ID:	10-378-09					
Dissolved Organic Carbon	**7.5**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**SEIMS-20201029**					
Laboratory ID:	10-378-10					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**TOSMI-20201029**					
Laboratory ID:	10-378-11					
Dissolved Organic Carbon	**2.9**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**TOSMO-20201029**					
Laboratory ID:	10-378-12					
Dissolved Organic Carbon	**3.1**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**TYLMI-20201029**					
Laboratory ID:	10-378-13					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	11-5-19	11-5-19	
Client ID:	**TYLMO-20201029**					
Laboratory ID:	10-378-14					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	11-5-19	11-5-19	

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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:	**QA75-20201029**					
Laboratory ID:	10-378-15					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	11-5-19	11-5-19	

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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:	MB1105D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	11-5-19	11-5-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-378-02								
	ORIG	DUP							
Dissolved Organic Carbon	**3.82**	**3.58**	NA	NA	NA	NA	6	15	
MATRIX SPIKE									
Laboratory ID:	10-378-02								
	MS		MS		MS				
Dissolved Organic Carbon	**13.9**		10.0	3.82	101	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1105D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.6**		10.0	NA	106	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-20201029**					
Laboratory ID:	10-378-01					
Total Phosphorus	**0.012**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**COUMI-20201029**					
Laboratory ID:	10-378-02					
Total Phosphorus	**0.10**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**COUMO-20201029**					
Laboratory ID:	10-378-03					
Total Phosphorus	**0.042**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**EVAMS-20201029**					
Laboratory ID:	10-378-04					
Total Phosphorus	**0.022**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**EVALSS-20201029**					
Laboratory ID:	10-378-05					
Total Phosphorus	**0.014**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**MONMN-20201029**					
Laboratory ID:	10-378-06					
Total Phosphorus	**0.050**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**MONMS-20201029**					
Laboratory ID:	10-378-07					
Total Phosphorus	**0.060**	0.010	EPA 365.1	10-31-19	11-4-19	

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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-20201029**					
Laboratory ID:	10-378-08					
Total Phosphorus	**0.020**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**SEIMN-20201029**					
Laboratory ID:	10-378-09					
Total Phosphorus	**0.022**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**SEIMS-20201029**					
Laboratory ID:	10-378-10					
Total Phosphorus	**0.022**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**TOSMI-20201029**					
Laboratory ID:	10-378-11					
Total Phosphorus	**0.050**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**TOSMO-20201029**					
Laboratory ID:	10-378-12					
Total Phosphorus	**0.065**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**TYLMI-20201029**					
Laboratory ID:	10-378-13					
Total Phosphorus	**0.018**	0.010	EPA 365.1	10-31-19	11-4-19	
Client ID:	**TYLMO-20201029**					
Laboratory ID:	10-378-14					
Total Phosphorus	**0.025**	0.010	EPA 365.1	10-31-19	11-4-19	

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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:	**QA75-20201029**					
Laboratory ID:	10-378-15					
Total Phosphorus	**0.053**	0.010	EPA 365.1	10-31-19	11-4-19	

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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:	MB1031W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	10-31-19	11-4-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	10-378-01								
	ORIG	DUP							
Total Phosphorus	**0.0124**	**0.0108**	NA	NA	NA	NA	14	14	
MATRIX SPIKE									
Laboratory ID:	10-378-01								
	MS		MS		MS				
Total Phosphorus	**0.236**		0.250	0.0124	89	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1031W1								
	SB		SB		SB				
Total Phosphorus	**0.222**		0.250	NA	89	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-20201029**					
Laboratory ID:	10-378-01					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**ND**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**COUMI-20201029**					
Laboratory ID:	10-378-02					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**17**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**COUMO-20201029**					
Laboratory ID:	10-378-03					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**10**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**EVAMS-20201029**					
Laboratory ID:	10-378-04					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**ND**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**EVALSS-20201029**					
Laboratory ID:	10-378-05					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**ND**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**MONMN-20201029**					
Laboratory ID:	10-378-06					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**6.3**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**MONMS-20201029**					
Laboratory ID:	10-378-07					
Copper	**1.3**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**5.8**	5.0	EPA 200.8	11-1-19	11-4-19	

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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-20201029**					
Laboratory ID:	10-378-08					
Copper	**1.0**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**7.7**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**SEIMN-20201029**					
Laboratory ID:	10-378-09					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**ND**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**SEIMS-20201029**					
Laboratory ID:	10-378-10					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**ND**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**TOSMI-20201029**					
Laboratory ID:	10-378-11					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**12**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**TOSMO-20201029**					
Laboratory ID:	10-378-12					
Copper	**1.8**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**34**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**TYLMI-20201029**					
Laboratory ID:	10-378-13					
Copper	**1.8**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**7.4**	5.0	EPA 200.8	11-1-19	11-4-19	
Client ID:	**TYLMO-20201029**					
Laboratory ID:	10-378-14					
Copper	**1.0**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**6.2**	5.0	EPA 200.8	11-1-19	11-4-19	

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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:	**QA75-20201029**					
Laboratory ID:	10-378-15					
Copper	**1.1**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**ND**	5.0	EPA 200.8	11-1-19	11-4-19	

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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:	MB1101WH1					
Copper	**ND**	1.0	EPA 200.8	11-1-19	11-4-19	
Zinc	**ND**	5.0	EPA 200.8	11-1-19	11-4-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-378-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-378-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**83.4**	**81.2**	100	100	ND	**83**	**81**	75-125	3	20	
Zinc	**104**	**104**	100	100	ND	**104**	**104**	75-125	0	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-20201029**					
Laboratory ID:	10-378-01					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	
Client ID:	**COUMI-20201029**					
Laboratory ID:	10-378-02					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**8.2**	5.0	EPA 200.8		11-1-19	
Client ID:	**COUMO-20201029**					
Laboratory ID:	10-378-03					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**7.3**	5.0	EPA 200.8		11-1-19	
Client ID:	**EVAMS-20201029**					
Laboratory ID:	10-378-04					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	
Client ID:	**EVALSS-20201029**					
Laboratory ID:	10-378-05					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	
Client ID:	**MONMN-20201029**					
Laboratory ID:	10-378-06					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	
Client ID:	**MONMS-20201029**					
Laboratory ID:	10-378-07					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	

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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:	**MONM-20201029**					
Laboratory ID:	10-378-08					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**5.3**	5.0	EPA 200.8		11-1-19	
Client ID:	**SEIMN-20201029**					
Laboratory ID:	10-378-09					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	
Client ID:	**SEIMS-20201029**					
Laboratory ID:	10-378-10					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	
Client ID:	**TOSMI-20201029**					
Laboratory ID:	10-378-11					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**7.2**	5.0	EPA 200.8		11-1-19	
Client ID:	**TOSMO-20201029**					
Laboratory ID:	10-378-12					
Copper	**1.1**	1.0	EPA 200.8		11-1-19	
Zinc	**17**	5.0	EPA 200.8		11-1-19	
Client ID:	**TYLMI-20201029**					
Laboratory ID:	10-378-13					
Copper	**1.7**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	
Client ID:	**TYLMO-20201029**					
Laboratory ID:	10-378-14					
Copper	**1.0**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	

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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:	**QA75-20201029**					
Laboratory ID:	10-378-15					
Copper	**1.1**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	

Date of Report: November 15, 2019
Samples Submitted: October 29, 2019
Laboratory Reference: 1910-378
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:	MB1101D1					
Copper	**ND**	1.0	EPA 200.8		11-1-19	
Zinc	**ND**	5.0	EPA 200.8		11-1-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-378-15										
	ORIG	DUP									
Copper	**1.06**	**1.08**	NA	NA		NA		NA	2	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-378-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**70.6**	**66.0**	80.0	80.0	1.06	**87**	**81**	75-125	7	20	
Zinc	**77.4**	**71.8**	80.0	80.0	ND	**97**	**90**	75-125	8	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 15 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-20191029	Water	19-A017853	Micro, NUT
COUMI-20191029	Water	19-A017854	Micro, NUT
COUMO-20191029	Water	19-A017855	Micro, NUT
EVAMS-20191029	Water	19-A017856	Micro, NUT
EVALSS-20191029	Water	19-A017857	Micro, NUT
MONMN-20191029	Water	19-A017858	Micro, NUT
MONMS-20191029	Water	19-A017859	Micro, NUT
MONM-20191029	Water	19-A017860	Micro, NUT
SEIMN-20191029	Water	19-A017861	Micro, NUT
SEIMS-20191029	Water	19-A017862	Micro, NUT
TOSMI-20191029	Water	19-A017863	Micro, NUT
TOSMO-20191029	Water	19-A017864	Micro, NUT
TYLMI-20191029	Water	19-A017865	Micro, NUT
TYLMO-20191029	Water	19-A017866	Micro, NUT
QA75-20191029	Water	19-A017867	Micro, NUT

Your samples were received on Tuesday, October 29, 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

Nov 15 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: 10-378

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

Am Test Inc.
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Kirkland, WA 98034
(425) 885-1664
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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: 10-378
All results reported on an as received basis.

Date Received: 10/29/19
Date Reported: 11/15/19

AMTEST Identification Number **19-A017853**
Client Identification **COLM-20191029**
Sampling Date **10/29/19, 09:46**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.93	mg/l		0.1			
Total Nitrogen (TKN)	0.864	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.062	mg/l		0.02	SM4500NO3	SH	11/04/19

AMTEST Identification Number **19-A017854**
Client Identification **COUMI-20191029**
Sampling Date **10/29/19, 11:22**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.330	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.17	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017855**
Client Identification **COUMO-20191029**
Sampling Date **10/29/19, 11:11**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	48.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.77	mg/l		0.1			
Total Nitrogen (TKN)	0.464	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.31	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017856**
Client Identification **EVAMS-20191029**
Sampling Date **10/29/19, 10:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	38.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	2.38	mg/l		0.1			
Total Nitrogen (TKN)	0.481	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	1.9	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017857**
Client Identification **EVALSS-20191029**
Sampling Date **10/29/19, 10:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	40.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	1.61	mg/l		0.1			
Total Nitrogen (TKN)	0.408	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	1.2	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017858**
Client Identification **MONMN-20191029**
Sampling Date **10/29/19, 13:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	29.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.46	mg/l		0.1			
Total Nitrogen (TKN)	0.411	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.044	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017859**
Client Identification **MONMS-20191029**
Sampling Date **10/29/19, 13:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	14.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.619	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017860**
Client Identification **MONM-20191029**
Sampling Date **10/29/19, 13:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	250	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.66	mg/l		0.1			
Total Nitrogen (TKN)	0.462	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.20	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017861**
Client Identification **SEIMN-20191029**
Sampling Date **10/29/19, 09:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	10.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.56	mg/l		0.1			
Total Nitrogen (TKN)	0.427	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.13	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017862**
Client Identification **SEIMS-20191029**
Sampling Date **10/29/19, 12:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	8.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.436	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.19	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017863**
Client Identification **TOSMI-20191029**
Sampling Date **10/29/19, 11:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	36.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.75	mg/l		0.1			
Total Nitrogen (TKN)	0.310	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.44	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017864**
Client Identification **TOSMO-20191029**
Sampling Date **10/29/19, 11:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	1.22	mg/l		0.1			
Total Nitrogen (TKN)	0.372	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.85	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017865**
Client Identification **TYLMI-20191029**
Sampling Date **10/29/19, 12:08**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	1.25	mg/l		0.1			
Total Nitrogen (TKN)	0.480	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.77	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017866**
Client Identification **TYLMO-20191029**
Sampling Date **10/29/19, 12:20**

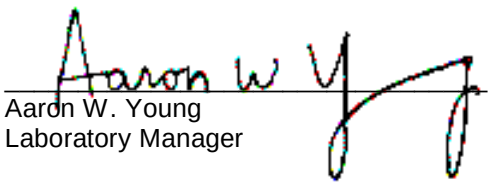
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.341	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	SH	11/11/19

AMTEST Identification Number **19-A017867**
Client Identification **QA75-20191029**
Sampling Date **10/29/19, 13:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	13.	CFU/100 ml		1	SM 9222D	AG	10/30/19
Total Nitrogen (NOX&TKN)	0.72	mg/l		0.1			
Total Nitrogen (TKN)	0.569	mg/l		0.2	SM4500N	SH	11/06/19
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	SH	11/11/19



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-A017853 to 19-A017867

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A017858	Fecal coliform	CFU/100 ml	29.	48.	49.
19-A017869	Fecal coliform	CFU/100 ml	3100	3700	18.
19-A017862	Total Nitrogen (TKN)	mg/l	0.436	0.414	5.2
19-A017931	Total Nitrogen (TKN)	mg/l	0.585	0.591	1.0
19-A018154	Total Nitrogen (TKN)	mg/l	0.538	0.536	0.37
19-A017349	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
19-A017407	Total Nitrate + Nitrite	mg/l	0.033	0.032	3.1
19-A017620	Total Nitrate + Nitrite	mg/l	1.3	1.2	8.0
19-A017653	Total Nitrate + Nitrite	mg/l	0.17	0.16	6.1
19-A017686	Total Nitrate + Nitrite	mg/l	9.6	9.2	4.3
19-A017694	Total Nitrate + Nitrite	mg/l	5.0	4.6	8.3
19-A017863	Total Nitrate + Nitrite	mg/l	0.44	0.46	4.4
19-A017880	Total Nitrate + Nitrite	mg/l	2.2	2.3	4.4
19-A017904	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
19-A018030	Total Nitrate + Nitrite	mg/l	0.68	0.75	9.8
19-A018321	Total Nitrate + Nitrite	mg/l	1.2	1.3	8.0
19-A018339	Total Nitrate + Nitrite	mg/l	4.6	4.6	0.00
19-A018572	Total Nitrate + Nitrite	mg/l	0.69	0.70	1.4

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A017862	Total Nitrogen (TKN)	mg/l	0.436	2.30	2.00	93.20 %
19-A017931	Total Nitrogen (TKN)	mg/l	0.585	2.40	2.00	90.75 %
19-A018154	Total Nitrogen (TKN)	mg/l	0.538	2.42	2.00	94.10 %
19-A017349	Total Nitrate + Nitrite	mg/l	< 0.02	0.94	1.0	94.00 %
19-A017407	Total Nitrate + Nitrite	mg/l	0.033	0.98	1.0	94.70 %
19-A017620	Total Nitrate + Nitrite	mg/l	1.3	2.0	1.0	70.00 %
19-A017653	Total Nitrate + Nitrite	mg/l	0.17	1.1	1.0	93.00 %
19-A017686	Total Nitrate + Nitrite	mg/l	9.6	19.	10.	94.00 %
19-A017694	Total Nitrate + Nitrite	mg/l	5.0	6.6	2.0	80.00 %
19-A017863	Total Nitrate + Nitrite	mg/l	0.44	1.4	1.0	96.00 %
19-A017880	Total Nitrate + Nitrite	mg/l	2.2	12.	10.	98.00 %
19-A017904	Total Nitrate + Nitrite	mg/l	< 0.02	0.83	1.0	83.00 %
19-A018030	Total Nitrate + Nitrite	mg/l	0.68	1.7	1.0	102.00 %
19-A018321	Total Nitrate + Nitrite	mg/l	1.2	2.1	1.0	90.00 %
19-A018339	Total Nitrate + Nitrite	mg/l	4.6	13.	10.	84.00 %
19-A018572	Total Nitrate + Nitrite	mg/l	0.69	1.6	1.0	91.00 %

QC Summary for sample numbers: 19-A017853 to 19-A017867...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.950	95.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.953	95.3 %
Total Nitrate + Nitrite	mg/l	1.0	0.98	98.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.96	96.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %
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
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 #: 10-378

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-20191029 17853	10/29/19	9:46	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20191029 54	10/29/19	11:22	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20191029 55	10/29/19	11:11	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20191029 56	10/29/19	10:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20191029 57	10/29/19	10:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20191029 58	10/29/19	13:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20191029 59	10/29/19	13:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20191029 60	10/29/19	13:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20191029 61	10/29/19	9:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20191029 62	10/29/19	12:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	10/29/19	1510	
Received by:	AMTEST T=4.7	10/29/19	1510	**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. 10-378

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~~ 20201029	10/29/19	9:46am	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-~~2019~~ 20201029	10/29/19	11:22	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-~~2019~~ 20201029	10/29/19	11:15	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-~~2019~~ 20201029	10/29/19	10:30am	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-~~2019~~ 20201029	10/29/19	10:45	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-~~2019~~ 20201029	10/29/19	13:45	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-~~2019~~ 20201029	10/29/19	13:30	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-~~2019~~ 20201029	10/29/19	13:05	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-~~2019~~ 20201029	10/29/19	9:15am	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-~~2019~~ 20201029	10/29/19	12:45	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-~~2019~~ 20201029	10/29/19	11:00	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-~~2019~~ 20201029	10/29/19	11:45	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-~~2019~~ 20201029	10/29/19	12:09	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-~~2019~~ 20201029	10/29/19	12:20	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 75-20201029	10/29	13:40	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nina Maas Date 10/29/19 Received by [illegible] Date 10/29/19
Firm _____ Time _____ Firm OSE Time 1406
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

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

3,6,6

CHAIN OF CUSTODY

Page 1 of 1

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. 10-378

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~~ 20201029	10/29/19	9:46am	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-~~2019~~ 20201029	10/29/19	11:22	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-~~2019~~ 20201029	10/29/19	11:15	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-~~2019~~ 20201029	10/29/19	10:30am	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-~~2019~~ 20201029	10/29/19	10:45	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-~~2019~~ 20201029	10/29/19	13:25	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-~~2019~~ 20201029	10/29/19	13:30	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-~~2019~~ 20201029	10/29/19	13:03	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-~~2019~~ 20201029	10/29/19	9:15am	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-~~2019~~ 20201029	10/29/19	12:45	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-~~2019~~ 20201029	10/29/19	11:00	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-~~2019~~ 20201029	10/29/19	11:45	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-~~2019~~ 20201029	10/29/19	12:08	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-~~2019~~ 20201029	10/29/19	12:25	Water	7	X	X	X	X	X	X	X	X	X			
	QA 75 - 20201029	10/29	13:40	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nina Maas Date 10/29/19 Received by [illegible] Date 10/29/19
Firm _____ Time _____ Firm OSE Time 1406
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:	Nina Maas
Meter:	YSI #2
Date/Time:	10/28/19
Barometric Pressure Start of Day:	mmHg: Time:
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.5	0	23.1	None
Conductivity (µS/cm)	99.7	1,000	23.1	
Conductivity (µS/cm)	99.3	100	23.1	
DO % Saturation	100.8	100	23.1	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.7	0		Forgot to take temp
Conductivity (µS/cm)	101.1	100		
DO % Saturation	107.2	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.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Nina Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 9.46 a.m PDT:

Base Flow or Storm Event? **Field Filtered Time:** 9:56 a.m 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, ~34°

Water Quality Sampling

Sample ID: Colm - 20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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, slightly yellow tint
Color:	Slightly yellow tint
Odor:	None
Sheen:	
Floatables:	Foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [illegible] Lenth **Signature:**

Date Checked: 12-17-19 **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): 5.65

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.4

Specific Conductivity (µs/cm) 49.9

Dissolved Oxygen (mg/L) 11.75

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maar, L. Colligan, M. O'Connor [illegible]

Sample Date: 10/29/19 **Sample Time:** 11:22 am PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:27 am 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: Sunny, 43

Water Quality Sampling

Sample ID: Coumi-20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Leavitt **Signature:**

Date Checked: 12-17-19 **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) 6.2

Specific Conductivity (µs/cm) 329.4

Dissolved Oxygen (mg/L) 12.39

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 11:15 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:20 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: Sunny, 43

Water Quality Sampling

Sample ID: Coumo - 20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lenth **Signature:**

Date Checked: 12-17-19 **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): 1.48

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.5

Specific Conductivity (µs/cm) 267.7

Dissolved Oxygen (mg/L) 11.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 10:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 10:35 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: Sunny, ~41°

Water Quality Sampling

Sample ID: Evams-20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: L. Lenth **Signature:**

Date Checked: 12-17-19 **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): 3.98

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.9°

Specific Conductivity (µs/cm) 215.6

Dissolved Oxygen (mg/L) 12.43

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Leath

Sample Date: 10/29/19 **Sample Time:** 10:45 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 10:50 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: Sunny, 41°

Water Quality Sampling

Sample ID: Evalss-20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Leath **Signature:**

Date Checked: 12-17-19 **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): 2.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.7

Specific Conductivity (µs/cm) 200.6

Dissolved Oxygen (mg/L) 12.82

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 13:15 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 13:20 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: Sunny, 45

Water Quality Sampling

Sample ID: Monmn - 20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Curtis **Signature:**

Date Checked: 12-17-19 **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): ~~0.12~~ 9.12 NM

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.2

Specific Conductivity (µs/cm) 206.3

Dissolved Oxygen (mg/L) 11.45

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 13:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 13:33 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, 45°

Water Quality Sampling

Sample ID: MonMS-20201029

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-MS-20201029

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: None

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: L. Lenth **Signature:**

Date Checked: 12-17-19 **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): 7.3

Reference Point (description): PVC pipe

Water Quality Measurments

Temperature (°C) 6.1

Specific Conductivity (µs/cm) 323.4

Dissolved Oxygen (mg/L) 9.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 13:05 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 13:10 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, 45°

Water Quality Sampling

Sample ID: Monm - 20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lenth **Signature:**

Date Checked: 12-13-19 **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

Reference Point (description): N/A

Water Quality Measurments

Temperature (°C) 6.5

Specific Conductivity (µs/cm) 235.3

Dissolved Oxygen (mg/L) 12.25

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Nina Más, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 9:15 a.m. PDT:

Base Flow or Storm Event? **Field Filtered Time:** 9:25 a.m. 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: Sunny, ~~34~~ 40°

Water Quality Sampling

Sample ID: Seimn - 2020 1029

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. Lenth **Signature:**

Date Checked: 12-17-19 **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) 79.1

Dissolved Oxygen (mg/L) 12.55

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 12:45 PDT:

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

Water Quality Sampling

Sample ID: Seims-2020 1029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: L. Lenth **Signature:**

Date Checked: 12-17-19 **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) 6.0

Specific Conductivity (µs/cm) 121.6

Dissolved Oxygen (mg/L) 12.11

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor, L. Enth

Sample Date: 10/29/19 **Sample Time:** 11:00 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:05 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, 40°

Water Quality Sampling

Sample ID: Tosmo-20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: L. Enth **Signature:**

Date Checked: 12-17-19 **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): ~~0.5~~ 0.56

Reference Point (description): ~~o~~ SG

Water Quality Measurments

Temperature (°C) 6.1°

Specific Conductivity (µs/cm) 270.6

Dissolved Oxygen (mg/L) 12.62

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **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: Tosmo

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny, 43

Water Quality Sampling

Sample ID: Tosmo-2020 1029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:
Sheen:
Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lenth **Signature:**

Date Checked: 12-17-19 **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): 0.73

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 313.6

Dissolved Oxygen (mg/L) 11.98

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Leath

Sample Date: 10/29/19 **Sample Time:** 12:08 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:10 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: Sunny, 44°

Water Quality Sampling

Sample ID: Tylmi-20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Leath **Signature:**

Date Checked: 12-17-19 **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): 4.54

Reference Point (description): Top of culvert to water

Water Quality Measurments

Temperature (°C) 9.3

Specific Conductivity (µs/cm) 228.3

Dissolved Oxygen (mg/L) 11.12

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, L. Colligan, M. O'Connor Lenth

Sample Date: 10/29/19 **Sample Time:** 12 20 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1225 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: Sunny, 44

Water Quality Sampling

Sample ID: Tylmo-20201029

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	None
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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lenth **Signature:**

Date Checked: 12-17-19 **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): 2.88

Reference Point (description): Top of culvert to water

Water Quality Measurments

Temperature (°C) 5.5

Specific Conductivity (µs/cm) 200.7

Dissolved Oxygen (mg/L) 12.62

Data Quality Assurance Worksheet

By N. Maas

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

Date 12/3/19 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 GC

Sample Date/Sample ID: 10/29/2019 /All locations, QA75 (MONMS) Lab Ref No 1910-378

date 12/10/19

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**	2	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	90	**±20**	15	**≤ 25**	**D=8.4**	**<2**	OK	FLAG MONMS J DUE TO FIELD DUPE EXCEEDANCE.
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	1	**≤ 25**	**62**	**≤ 25**	OK	FLAG MONMS J DUE TO FIELD DUPE EXCEEDANCE.
Hardness	OK / SM 2340B	NA	**NA**	10	**≤180**	≤1.0 mg/L 1.0 mg/L	88,99	**±25**	97	**±15**	3	**≤ 20**	7.4	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	10	**≤15**	10	**≤28**	≤1.0 mg/L 1.0 mg/L	101	**±25**	106	**±15**	6	**≤ 20**	0	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	9	**≤28**	≤0.01 mg/L 0.01 mg/L	89	**±25**	89	**±20**	14	**≤ 20**	12	**≤ 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	91,93, 94	**±25**	95,93	**±20**	0.37,1.0, 5.2	**≤ 20**	D = 0.05	**≤ 0.4**	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 N. Maas

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

Date 12/3/19 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 GC

Sample Date/Sample ID: 10/29/2019 /All locations, QA75 (MONMS) Lab Ref No 1910-378

date 12/10/19

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**	9	**≤180**	≤1.0 µg/L 1.0 µg/L	81,83	**±25**	NR	**±15**	NC	**≤ 20**	D=0.2	**≤ 2**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	9	**≤180**	≤5.0 µg/L 5.0 µg/L	104	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	<3	**≤15**	3	**≤180**	≤1.0 µg/L 1.0 µg/L	81,87	**±25**	NR	**±15**	2	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	<3	**≤15**	3	**≤180**	≤5.0 µg/L 5.0 µg/L	90,97	**±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**	18,**49**	**≤ 35**	7.4	**≤ 50**	OK	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

December 4, 2019

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1911-151

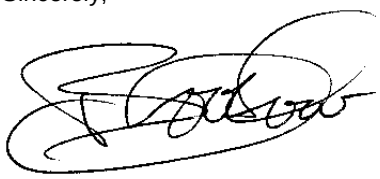
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on November 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: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
Project: 14-05806-000

Case Narrative

Samples were collected on November 15, 2019 and received by the laboratory on November 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: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
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-20191115**					
Laboratory ID:	11-151-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**COUMI-20191115**					
Laboratory ID:	11-151-02					
Total Suspended Solids	**110**	2.5	SM 2540D	11-15-19	11-18-19	
Client ID:	**COUMO-20191115**					
Laboratory ID:	11-151-03					
Total Suspended Solids	**39**	2.5	SM 2540D	11-15-19	11-18-19	
Client ID:	**EVAMS-20191115**					
Laboratory ID:	11-151-04					
Total Suspended Solids	**4.8**	1.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**EVALSS-20191115**					
Laboratory ID:	11-151-05					
Total Suspended Solids	**16**	1.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**MONMN-20191115**					
Laboratory ID:	11-151-06					
Total Suspended Solids	**4.6**	1.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**MONMS-20191115**					
Laboratory ID:	11-151-07					
Total Suspended Solids	**5.8**	1.0	SM 2540D	11-15-19	11-18-19	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
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-20191115**					
Laboratory ID:	11-151-08					
Total Suspended Solids	**8.8**	1.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**SEIMN-20191115**					
Laboratory ID:	11-151-09					
Total Suspended Solids	**20**	2.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**SEIMS-20191115**					
Laboratory ID:	11-151-10					
Total Suspended Solids	**15**	2.5	SM 2540D	11-15-19	11-18-19	
Client ID:	**TOSMI-20191115**					
Laboratory ID:	11-151-11					
Total Suspended Solids	**140**	5.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**TOSMO-20191115**					
Laboratory ID:	11-151-12					
Total Suspended Solids	**160**	5.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**TYLMI-20191115**					
Laboratory ID:	11-151-13					
Total Suspended Solids	**8.2**	1.0	SM 2540D	11-15-19	11-18-19	
Client ID:	**TYLMO-20191115**					
Laboratory ID:	11-151-14					
Total Suspended Solids	**24**	2.0	SM 2540D	11-15-19	11-18-19	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
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-20191115**					
Laboratory ID:	11-151-15					
Total Suspended Solids	**ND**	1.0	SM 2540D	11-15-19	11-18-19	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
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:	MB1115W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	11-15-19	11-18-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-151-02								
	ORIG	DUP							
Total Suspended Solids	**115**	**118**	NA	NA	NA	NA	3	23	
SPIKE BLANK									
Laboratory ID:	SB1115W1								
	SB		SB		SB				
Total Suspended Solids	**103**		100	NA	103	69-122	NA	NA	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20191115**					
Laboratory ID:	11-151-01					
Turbidity	**0.91**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**COUMI-20191115**					
Laboratory ID:	11-151-02					
Turbidity	**56**	0.20	EPA 180.1	11-15-19	11-15-19	
Client ID:	**COUMO-20191115**					
Laboratory ID:	11-151-03					
Turbidity	**18**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**EVAMS-20191115**					
Laboratory ID:	11-151-04					
Turbidity	**1.9**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**EVALSS-20191115**					
Laboratory ID:	11-151-05					
Turbidity	**8.3**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**MONMN-20191115**					
Laboratory ID:	11-151-06					
Turbidity	**2.9**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**MONMS-20191115**					
Laboratory ID:	11-151-07					
Turbidity	**3.3**	0.10	EPA 180.1	11-15-19	11-15-19	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20191115**					
Laboratory ID:	11-151-08					
Turbidity	**5.1**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**SEIMN-20191115**					
Laboratory ID:	11-151-09					
Turbidity	**10**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**SEIMS-20191115**					
Laboratory ID:	11-151-10					
Turbidity	**7.0**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**TOSMI-20191115**					
Laboratory ID:	11-151-11					
Turbidity	**50**	0.20	EPA 180.1	11-15-19	11-15-19	
Client ID:	**TOSMO-20191115**					
Laboratory ID:	11-151-12					
Turbidity	**80**	0.50	EPA 180.1	11-15-19	11-15-19	
Client ID:	**TYLMI-20191115**					
Laboratory ID:	11-151-13					
Turbidity	**3.9**	0.10	EPA 180.1	11-15-19	11-15-19	
Client ID:	**TYLMO-20191115**					
Laboratory ID:	11-151-14					
Turbidity	**15**	0.10	EPA 180.1	11-15-19	11-15-19	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA-20191115**					
Laboratory ID:	11-151-15					
Turbidity	**1.2**	0.10	EPA 180.1	11-15-19	11-15-19	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
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:	MB1115W1					
Turbidity	**ND**	0.10	EPA 180.1	11-15-19	11-15-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-151-13								
	ORIG	DUP							
Turbidity	**3.91**	**4.18**	NA	NA	NA	NA	7	15	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
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-20191115**					
Laboratory ID:	11-151-01					
Hardness	**15**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**COUMI-20191115**					
Laboratory ID:	11-151-02					
Hardness	**66**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**COUMO-20191115**					
Laboratory ID:	11-151-03					
Hardness	**52**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**EVAMS-20191115**					
Laboratory ID:	11-151-04					
Hardness	**90**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**EVALSS-20191115**					
Laboratory ID:	11-151-05					
Hardness	**79**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**MONMN-20191115**					
Laboratory ID:	11-151-06					
Hardness	**73**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**MONMS-20191115**					
Laboratory ID:	11-151-07					
Hardness	**140**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	

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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:	**MONM-20191115**					
Laboratory ID:	11-151-08					
Hardness	**86**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**SEIMN-20191115**					
Laboratory ID:	11-151-09					
Hardness	**31**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**SEIMS-20191115**					
Laboratory ID:	11-151-10					
Hardness	**47**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**TOSMI-20191115**					
Laboratory ID:	11-151-11					
Hardness	**53**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**TOSMO-20191115**					
Laboratory ID:	11-151-12					
Hardness	**80**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**TYLMI-20191115**					
Laboratory ID:	11-151-13					
Hardness	**94**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	
Client ID:	**TYLMO-20191115**					
Laboratory ID:	11-151-14					
Hardness	**27**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	

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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:	**QA76-20191115**					
Laboratory ID:	11-151-15					
Hardness	**16**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	

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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:	MB1118WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	11-18-19	11-18-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-154-01										
	ORIG	DUP									
Hardness	**297**	**297**	NA		NA	NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	11-154-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**439**	**433**	132	132	297	108	103	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB1118WH1										
	SB		SB			SB					
Hardness	**132**		132		NA	100		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-20191115**					
Laboratory ID:	11-151-01					
Dissolved Organic Carbon	**17**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**COUMI-20191115**					
Laboratory ID:	11-151-02					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**COUMO-20191115**					
Laboratory ID:	11-151-03					
Dissolved Organic Carbon	**8.5**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**EVAMS-20191115**					
Laboratory ID:	11-151-04					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**EVALSS-20191115**					
Laboratory ID:	11-151-05					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**MONMN-20191115**					
Laboratory ID:	11-151-06					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**MONMS-20191115**					
Laboratory ID:	11-151-07					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	11-21-19	11-21-19	

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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-20191115**					
Laboratory ID:	11-151-08					
Dissolved Organic Carbon	**5.2**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**SEIMN-20191115**					
Laboratory ID:	11-151-09					
Dissolved Organic Carbon	**6.3**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**SEIMS-20191115**					
Laboratory ID:	11-151-10					
Dissolved Organic Carbon	**8.1**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**TOSMI-20191115**					
Laboratory ID:	11-151-11					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**TOSMO-20191115**					
Laboratory ID:	11-151-12					
Dissolved Organic Carbon	**7.9**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**TYLMI-20191115**					
Laboratory ID:	11-151-13					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	11-21-19	11-21-19	
Client ID:	**TYLMO-20191115**					
Laboratory ID:	11-151-14					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	11-21-19	11-21-19	

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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:	**QA76-20191115**					
Laboratory ID:	11-151-15					
Dissolved Organic Carbon	**16**	1.0	SM 5310B	11-21-19	11-21-19	

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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:	MB1121D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	11-21-19	11-21-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-151-05								
	ORIG	DUP							
Dissolved Organic Carbon	**4.25**	**4.36**	NA	NA	NA	NA	3	15	
MATRIX SPIKE									
Laboratory ID:	11-151-05								
	MS		MS		MS				
Dissolved Organic Carbon	**12.9**		10.0	4.25	87	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1121D1								
	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-20191115**					
Laboratory ID:	11-151-01					
Total Phosphorus	**0.019**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**COUMI-20191115**					
Laboratory ID:	11-151-02					
Total Phosphorus	**0.30**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**COUMO-20191115**					
Laboratory ID:	11-151-03					
Total Phosphorus	**0.14**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**EVAMS-20191115**					
Laboratory ID:	11-151-04					
Total Phosphorus	**0.027**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**EVALSS-20191115**					
Laboratory ID:	11-151-05					
Total Phosphorus	**0.045**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**MONMN-20191115**					
Laboratory ID:	11-151-06					
Total Phosphorus	**0.086**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**MONMS-20191115**					
Laboratory ID:	11-151-07					
Total Phosphorus	**0.058**	0.010	EPA 365.1	11-20-19	11-21-19	

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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-20191115**					
Laboratory ID:	11-151-08					
Total Phosphorus	**0.058**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**SEIMN-20191115**					
Laboratory ID:	11-151-09					
Total Phosphorus	**0.081**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**SEIMS-20191115**					
Laboratory ID:	11-151-10					
Total Phosphorus	**0.086**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**TOSMI-20191115**					
Laboratory ID:	11-151-11					
Total Phosphorus	**0.23**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**TOSMO-20191115**					
Laboratory ID:	11-151-12					
Total Phosphorus	**0.36**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**TYLMI-20191115**					
Laboratory ID:	11-151-13					
Total Phosphorus	**0.064**	0.010	EPA 365.1	11-20-19	11-21-19	
Client ID:	**TYLMO-20191115**					
Laboratory ID:	11-151-14					
Total Phosphorus	**0.10**	0.010	EPA 365.1	11-20-19	11-21-19	

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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:	**QA76-20191115**					
Laboratory ID:	11-151-15					
Total Phosphorus	**0.018**	0.010	EPA 365.1	11-20-19	11-21-19	

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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:	MB1120W2					
Total Phosphorus	**ND**	0.010	EPA 365.1	11-20-19	11-21-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	11-151-01								
	ORIG	DUP							
Total Phosphorus	**0.0189**	**0.0197**	NA	NA	NA	NA	4	14	
MATRIX SPIKE									
Laboratory ID:	11-151-01								
	MS		MS		MS				
Total Phosphorus	**0.261**		0.250	0.0189	97	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1120W2								
	SB		SB		SB				
Total Phosphorus	**0.235**		0.250	NA	94	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-20191115**					
Laboratory ID:	11-151-01					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**ND**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**COUMI-20191115**					
Laboratory ID:	11-151-02					
Copper	**10**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**92**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**COUMO-20191115**					
Laboratory ID:	11-151-03					
Copper	**5.4**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**160**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**EVAMS-20191115**					
Laboratory ID:	11-151-04					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**ND**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**EVALSS-20191115**					
Laboratory ID:	11-151-05					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**ND**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**MONMN-20191115**					
Laboratory ID:	11-151-06					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**6.5**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**MONMS-20191115**					
Laboratory ID:	11-151-07					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**5.1**	5.0	EPA 200.8	11-19-19	11-20-19	

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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-20191115**					
Laboratory ID:	11-151-08					
Copper	**1.2**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**13**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**SEIMN-20191115**					
Laboratory ID:	11-151-09					
Copper	**1.5**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**ND**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**SEIMS-20191115**					
Laboratory ID:	11-151-10					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**ND**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**TOSMI-20191115**					
Laboratory ID:	11-151-11					
Copper	**12**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**160**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**TOSMO-20191115**					
Laboratory ID:	11-151-12					
Copper	**12**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**130**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**TYLMI-20191115**					
Laboratory ID:	11-151-13					
Copper	**3.1**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**14**	5.0	EPA 200.8	11-19-19	11-20-19	
Client ID:	**TYLMO-20191115**					
Laboratory ID:	11-151-14					
Copper	**7.6**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**24**	5.0	EPA 200.8	11-19-19	11-20-19	

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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:	**QA76-20191115**					
Laboratory ID:	11-151-15					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**ND**	5.0	EPA 200.8	11-19-19	11-20-19	

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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:	MB1119WH2					
Copper	**ND**	1.0	EPA 200.8	11-19-19	11-20-19	
Zinc	**ND**	5.0	EPA 200.8	11-19-19	11-20-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-151-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	11-151-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**91.6**	**109**	100	100	ND	**92**	**109**	75-125	17	20	
Zinc	**98.4**	**115**	100	100	ND	**98**	**115**	75-125	16	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-20191115**					
Laboratory ID:	11-151-01					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	
Client ID:	**COUMI-20191115**					
Laboratory ID:	11-151-02					
Copper	**2.4**	1.0	EPA 200.8		11-20-19	
Zinc	**9.0**	5.0	EPA 200.8		11-20-19	
Client ID:	**COUMO-20191115**					
Laboratory ID:	11-151-03					
Copper	**2.6**	1.0	EPA 200.8		11-20-19	
Zinc	**100**	5.0	EPA 200.8		11-20-19	
Client ID:	**EVAMS-20191115**					
Laboratory ID:	11-151-04					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	
Client ID:	**EVALSS-20191115**					
Laboratory ID:	11-151-05					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	
Client ID:	**MONMN-20191115**					
Laboratory ID:	11-151-06					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	
Client ID:	**MONMS-20191115**					
Laboratory ID:	11-151-07					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	

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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:	**MONM-20191115**					
Laboratory ID:	11-151-08					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**5.1**	5.0	EPA 200.8		11-20-19	
Client ID:	**SEIMN-20191115**					
Laboratory ID:	11-151-09					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	
Client ID:	**SEIMS-20191115**					
Laboratory ID:	11-151-10					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	
Client ID:	**TOSMI-20191115**					
Laboratory ID:	11-151-11					
Copper	**4.8**	1.0	EPA 200.8		11-20-19	
Zinc	**51**	5.0	EPA 200.8		11-20-19	
Client ID:	**TOSMO-20191115**					
Laboratory ID:	11-151-12					
Copper	**2.7**	1.0	EPA 200.8		11-20-19	
Zinc	**14**	5.0	EPA 200.8		11-20-19	
Client ID:	**TYLMI-20191115**					
Laboratory ID:	11-151-13					
Copper	**1.5**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	
Client ID:	**TYLMO-20191115**					
Laboratory ID:	11-151-14					
Copper	**4.0**	1.0	EPA 200.8		11-20-19	
Zinc	**5.7**	5.0	EPA 200.8		11-20-19	

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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:	**QA76-20191115**					
Laboratory ID:	11-151-15					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	

Date of Report: December 4, 2019
Samples Submitted: November 15, 2019
Laboratory Reference: 1911-151
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:	MB1120D1					
Copper	**ND**	1.0	EPA 200.8		11-20-19	
Zinc	**ND**	5.0	EPA 200.8		11-20-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-151-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	11-151-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**66.8**	**65.4**	80.0	80.0	ND	**84**	**82**	75-125	2	20	
Zinc	**74.2**	**74.8**	80.0	80.0	ND	**93**	**94**	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

Dec 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-20201115	Water	19-A018879	Micro, NUT
COUMI-20201115	Water	19-A018880	Micro, NUT
COUMO-20201115	Water	19-A018881	Micro, NUT
EVAMS-20201115	Water	19-A018882	Micro, NUT
EVALSS-20201115	Water	19-A018883	Micro, NUT
MONMN-20201115	Water	19-A018884	Micro, NUT
MONMS-20201115	Water	19-A018885	Micro, NUT
MONM-20201115	Water	19-A018886	Micro, NUT
SEIMN-20201115	Water	19-A018887	Micro, NUT
SEIMS-20201115	Water	19-A018888	Micro, NUT
TOSMI-20201115	Water	19-A018889	Micro, NUT
TOSMO-20201115	Water	19-A018890	Micro, NUT
TYLMI-20201115	Water	19-A018891	Micro, NUT
TYLMO-20201115	Water	19-A018892	Micro, NUT
QA76-20201115	Water	19-A018893	Micro, NUT

Your samples were received on Friday, November 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

Dec 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: 11-151

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

Am Test Inc.
13600 NE 126TH PL
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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: 11-151
All results reported on an as received basis.

Date Received: 11/15/19
Date Reported: 12/ 4/19

AMTEST Identification Number **19-A018879**
Client Identification **COLM-20201115**
Sampling Date **11/15/19, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4.	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.712	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.032	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018880**
Client Identification **COUMI-20201115**
Sampling Date **11/15/19, 06:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2300	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	1.10	mg/l		0.1			
Total Nitrogen (TKN)	0.988	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.11	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018881**
Client Identification **COUMO-20201115**
Sampling Date **11/15/19, 05:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	960	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	1.03	mg/l		0.1			
Total Nitrogen (TKN)	0.808	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.22	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018882**
Client Identification **EVAMS-20201115**
Sampling Date **11/15/19, 06:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	38.	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	2.17	mg/l		0.1			
Total Nitrogen (TKN)	0.468	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	1.7	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018883**
Client Identification **EVALSS-20201115**
Sampling Date **11/15/19, 06:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	1.72	mg/l		0.1			
Total Nitrogen (TKN)	0.515	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	1.2	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018884**
Client Identification **MONMN-20201115**
Sampling Date **11/15/19, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	700	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.684	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018885**
Client Identification **MONMS-20201115**
Sampling Date **11/15/19, 07:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	46.	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.58	mg/l		0.1			
Total Nitrogen (TKN)	0.444	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018886**
Client Identification **MONM-20201115**
Sampling Date **11/15/19, 08:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.508	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018887**
Client Identification **SEIMN-20201115**
Sampling Date **11/15/19, 07:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	18.	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.71	mg/l		0.1			
Total Nitrogen (TKN)	0.578	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.13	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018888**
Client Identification **SEIMS-20201115**
Sampling Date **11/15/19, 08:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	82.	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.657	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018889**
Client Identification **TOSMI-20201115**
Sampling Date **11/15/19, 05:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1800	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	1.28	mg/l		0.1			
Total Nitrogen (TKN)	0.829	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.45	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018890**
Client Identification **TOSMO-20201115**
Sampling Date **11/15/19, 06:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	1.66	mg/l		0.1			
Total Nitrogen (TKN)	1.18	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.48	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018891**
Client Identification **TYLMI-20201115**
Sampling Date **11/15/19, 07:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	27.	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	1.16	mg/l		0.1			
Total Nitrogen (TKN)	0.453	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.71	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018892**
Client Identification **TYLMO-20201115**
Sampling Date **11/15/19, 06:45**

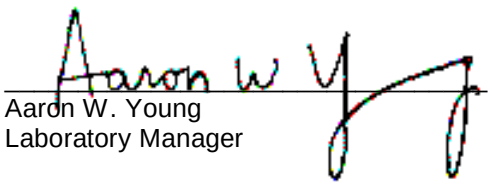
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	840	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.76	mg/l		0.1			
Total Nitrogen (TKN)	0.688	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.067	mg/l		0.02	SM4500NO3	SH	11/19/19

AMTEST Identification Number **19-A018893**
Client Identification **QA76-20201115**
Sampling Date **11/15/19, 07:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		1	SM 9222D	AG	11/15/19
Total Nitrogen (NOX&TKN)	0.72	mg/l		0.1			
Total Nitrogen (TKN)	0.667	mg/l		0.2	SM4500N	SH	11/20/19
Total Nitrate + Nitrite	0.056	mg/l		0.02	SM4500NO3	SH	11/19/19



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-A018879 to 19-A018893

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A018868	Fecal coliform	CFU/100 ml	510	520	1.9
19-A018883	Fecal coliform	CFU/100 ml	200	200	0.00
19-A018884	Total Nitrogen (TKN)	mg/l	0.684	0.682	0.29
19-A018893	Total Nitrogen (TKN)	mg/l	0.667	0.690	3.4
19-A018750	Total Nitrate + Nitrite	mg/l	0.15	0.16	6.5
19-A018759	Total Nitrate + Nitrite	mg/l	0.25	0.28	11.
19-A018832	Total Nitrate + Nitrite	mg/l	0.31	0.33	6.2
19-A018842	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
19-A018888	Total Nitrate + Nitrite	mg/l	0.14	0.17	19.
19-A018916	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A018884	Total Nitrogen (TKN)	mg/l	0.684	2.79	2.00	105.30 %
19-A018893	Total Nitrogen (TKN)	mg/l	0.667	2.71	2.00	102.15 %
19-A018750	Total Nitrate + Nitrite	mg/l	0.15	1.1	1.0	95.00 %
19-A018759	Total Nitrate + Nitrite	mg/l	0.25	1.2	1.0	95.00 %
19-A018832	Total Nitrate + Nitrite	mg/l	0.31	1.2	1.0	89.00 %
19-A018842	Total Nitrate + Nitrite	mg/l	< 0.02	0.87	1.0	87.00 %
19-A018888	Total Nitrate + Nitrite	mg/l	0.14	1.1	1.0	96.00 %
19-A018916	Total Nitrate + Nitrite	mg/l	< 0.02	0.92	1.0	92.00 %

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	1.06	106. %
Total Nitrate + Nitrite	mg/l	1.0	0.91	91.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.98	98.0 %

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

OnSite Environmental Inc.

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

Laboratory Reference #: 11-151

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-20201115 (18879)	11/15/19	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20201115 (80)	11/15/19	6:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMC-20201115 (81)	11/15/19	5:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20201115 (82)	11/15/19	6:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20201115 (83)	11/15/19	6:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20201115 (84)	11/15/19	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20201115 (85)	11/15/19	7:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20201115 (86)	11/15/19	8:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20201115 (87)	11/15/19	7:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20201115 (88)	11/15/19	8:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:		OSE	11/15/19	1224	
Received by:		AmTest	11/15/19	1224	**EDDs - CSV**
Relinquished by:					**Reporting Limits:**
Received by:					**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:					**Total Nitrogen - .10 mg/L**
Received by:					

T=2.0

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

Laboratory Reference #: 11-151

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-20201115 18889	11/15/19	5:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20201115 90	11/15/19	6:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20201115 91	11/15/19	7:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20201115 92	11/15/19	6:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA76-20201115 93	11/15/19	7:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by: Helen Lascom	OSE	11/15/19	1224	EDDs - CSV
Received by:	Amtest	11/15/19	1224	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. 11-151

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~~ 2019 ~~2020~~ 1115	11/15/19	0730	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-~~2019~~ 2019 ~~2020~~ 1115		0615	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-~~2019~~ 2019 ~~2020~~ 1115		0535	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-~~2019~~ 2019 ~~2020~~ 1115		0605	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-~~2019~~ 2019 ~~2020~~ 1115		0620	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-~~2019~~ 2019 ~~2020~~ 1115		0730	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-~~2019~~ 2019 ~~2020~~ 1115		0745	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-~~2019~~ 2019 ~~2020~~ 1115		0815	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-~~2019~~ 2019 ~~2020~~ 1115		0700	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-~~2019~~ 2019 ~~2020~~ 1115		0815	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-~~2019~~ 2019 ~~2020~~ 1115		0530	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-~~2019~~ 2019 ~~2020~~ 1115		0630	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-~~2019~~ 2019 ~~2020~~ 1115		0710	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-~~2019~~ 2019 ~~2020~~ 1115		0645	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 76 - ~~2019~~ 2019 ~~2020~~ 1115	↓	0740	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 11/15/19 Received by _____ Date 11/15/19
Firm _____ Time _____ Firm OSE Time 9:00

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

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. 11-151

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~~ 20201115	11/15/19	0730	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-~~2019~~ 20201115		0615	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-~~2019~~ 20201115		0535	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-~~2019~~ 20201115		0605	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-~~2019~~ 20201115		0620	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-~~2019~~ 20201115		0730	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-~~2019~~ 20201115		0745	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-~~2019~~ 20201115		0815	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-~~2019~~ 20201115		0700	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-~~2019~~ 20201115		0815	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-~~2019~~ 20201115		0530	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-~~2019~~ 20201115		0630	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-~~2019~~ 20201115		0710	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-~~2019~~ 20201115		0645	Water	7	X	X	X	X	X	X	X	X	X			
	QA76-20201115		0740	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 11/15/19 Received by _____ Date 11/15/19

Firm _____ Time _____ Firm OSE Time 9:00

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:	N. Maas
Meter:	YSI #1
Date/Time:	11/14/19 10:20
Barometric Pressure Start of Day:	mmHg: Time:
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.8	0	22.9	
Conductivity (µS/cm)	995	1,000	22.7	
Conductivity (µS/cm)	100.3	100	22.7	
DO % Saturation	98.1	100	23.8	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.7	0	22.1	
Conductivity (µS/cm)	100.7	100	22.0	
DO % Saturation	104.8	100	20.4	

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:	N. Maas
Meter:	YSI #2
Date/Time:	11/14/19 10:20
Barometric Pressure Start of Day:	mmHg: Time:
Barometric Pressure End of Day:	mmHg: 785.7 Time: 10:20 a 11.15.19

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.9	0	23.5	
Conductivity (µS/cm)	1004	1,000	23.1	
Conductivity (µS/cm)	100.9	100	23.1	
DO % Saturation	96.7	100	24.3	*

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.5	0	22.6	Herrera DI water
Conductivity (µS/cm)	100.9	100	23.5	
DO % Saturation	102.4	100	22.9	

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.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/15/19 **Sample Time:** 0725/0735 PDT: **Field Filtered Time:** 0740/0730 PST:

Base Flow or Storm Event? (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: 45° Rainy

Water Quality Sampling

Sample ID: COLM-20201115

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:	QA76-20201115
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	clear/slight turbid
Color:	tannin/red
Odor:	none
Sheen:	↓
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leuth **Signature:**

Date Checked: 12-17-19 **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): 5.58

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 483

Dissolved Oxygen (mg/L) 10.91

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + MH

Sample Date: 11.15.19 **Sample Time:** 6:10 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 6:15 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: Rany 50°

Water Quality Sampling

Sample ID: COUMI-20191115

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: Turbid, darker water

Color: C NA

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 12-17-19 **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): 2.06

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.3

Specific Conductivity (µs/cm) 134.8

Dissolved Oxygen (mg/L) 11.49

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + MMH

Sample Date: 11.15.19 **Sample Time:** 5:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 5:35* 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 56°

Water Quality Sampling

Sample ID: COUMO-20191115

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: Turbid

Color: N.A.

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Tahna Lemke **Signature:**

Date Checked: 12-17-19 **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): 1.53

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.7

Specific Conductivity (µs/cm) 101.4

Dissolved Oxygen (mg/L) 11.21

*sampled at 5:35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 11/15/19 **Sample Time:** 0600 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0605 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: 45° Rainy

Water Quality Sampling

Sample ID: EVAMS-20191115

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 Louth **Signature:**

Date Checked: 12-17-19 **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): 3.90

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.3

Specific Conductivity (µs/cm) 208.0

Dissolved Oxygen (mg/L) 11.73

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, K. Bliss

Sample Date: 11/15/19 **Sample Time:** 0615 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0620 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: 45° Rainy

Water Quality Sampling

Sample ID: EVALSS-20201115

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lundt **Signature:**

Date Checked: 12-17-19 **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): 2.34

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.6

Specific Conductivity (µs/cm) 188.4

Dissolved Oxygen (mg/L) 12.12

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + MMH

Sample Date: 20191115 **Sample Time:** 7:25 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 7:30 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: Sprinkling/light rain, 50°

Water Quality Sampling

Sample ID: MONMN-20191115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	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~~ Clear

Color: NA

Odor:

Sheen:

Floatables: Slight foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lenth **Signature:**

Date Checked: 12-17-19 **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): 9.16

Reference Point (description): Top of PVC pipe on SG

Water Quality Measurments

Temperature (°C) 9.1

Specific Conductivity (µs/cm) 176.7

Dissolved Oxygen (mg/L) 10.69

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM+ MMM

Sample Date: 20191115 **Sample Time:** 7:40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 7:45 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: Sprinkling 50°

Water Quality Sampling

Sample ID: MONMS-20191115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	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: decomposition odor

Sheen: NA

Floatables: some foam/bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lyatt **Signature:**

Date Checked: 12-17-19 **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): 6.62

Reference Point (description): Top of PVC pipe dam

Water Quality Measurments

Temperature (°C) 9.1

Specific Conductivity (µs/cm) 332.0

Dissolved Oxygen (mg/L) 8.29

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 11/15/19 **Sample Time:** 0810 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0815 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: 45° Rainy

Water Quality Sampling

Sample ID: MONM-20201115

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lynch **Signature:**

Date Checked: 12-17-19 **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): —

Water Quality Measurments

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 213.0

Dissolved Oxygen (mg/L) 11.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/15/19 **Sample Time:** 0655 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0700 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: 45° Rainy

Water Quality Sampling

Sample ID: SEIMN-20200115

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:	slightly brown
Odor:	NO
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leutla **Signature:**

Date Checked: 12-17-19 **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): 0.675

Reference Point (description): top of bolt

Water Quality Measurments

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 79.2

Dissolved Oxygen (mg/L) 12.03

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + MMH

Sample Date: 20191115 **Sample Time:** 8:15 PDT

Base Flow or Storm Event? (Base Flow) **Field Filtered Time:** 0820 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: Cloudy, 50°

Water Quality Sampling

Sample ID: SEIMS-20191115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	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: Tan

Odor: N/A

Sheen: N/A

Floatables: minimal bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Lehtl **Signature:**

Date Checked: 12-17-19 **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): 0.79

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.4

Specific Conductivity (µs/cm) 112.5

Dissolved Oxygen (mg/L) 11.15

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N.Maas, K.Bliss

Sample Date: 11/15/19 **Sample Time:** 0525 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0530 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: 45° Rainy

Water Quality Sampling

Sample ID: TOSMI-20201115

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:	↓
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Sohyun Lauth **Signature:**

Date Checked: 12-17-19 **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) 10.5

Specific Conductivity (µs/cm) ~~162.8~~ 116.5 NM

Dissolved Oxygen (mg/L) 11.47

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMY + MM

Sample Date: 2019 11 15 **Sample Time:** 6:25 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 6:30 PST:

(Must filter within 15 minutes of collection)

SITE ID: ~~TOSMO~~ TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: Rany 50°

Water Quality Sampling

Sample ID: TOSMO-20191115

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: Turbid more than previous CoMF

Color: Darker

Odor: NA

Sheen:

Floatables: FOAMING @ WEIR

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: John Leutz **Signature:**

Date Checked: 12-17-19 **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): 0.82

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.9

Specific Conductivity (µs/cm) 173.3

Dissolved Oxygen (mg/L) 11.43

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + MMY

Sample Date: 20191115 **Sample Time:** 7:05 PDT:

Base Flow or Storm Event? (circled) **Field Filtered Time:** 7:10 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: sprinkling, 50°

Water Quality Sampling

Sample ID: TYLMI-20191115

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 12-17-19 **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): 4.45

Reference Point (description): Top of culvert down

Water Quality Measurments

Temperature (°C) 9.8

Specific Conductivity (µs/cm) 222.6

Dissolved Oxygen (mg/L) 11.05

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH + MM

Sample Date: 2019 11 15 **Sample Time:** 6:40 PDT:

Base Flow or Storm Event? (Storm)

Field Filtered Time: 6:45 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 50°

Water Quality Sampling

Sample ID: TYLMO-20191115

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 turbidity

Color: NA

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: Silvia Cantu **Signature:**

Date Checked: 12-17-19 **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): 2.75

Reference Point (description): Top of culvert down

Water Quality Measurments

Temperature (°C) 9.4

Specific Conductivity (µs/cm) 67.2

Dissolved Oxygen (mg/L) 98.9 * %?

Data Quality Assurance Worksheet

By N. Maas

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

Date 12/5/2019 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 GC

Sample Date/Sample ID: 11/15/2019 /All locations, QA76 (COLM) Lab Ref No 1911-151

date 12/10/19

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**	103	**±20**	3	**≤ 25**	NC	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	7	**≤ 25**	**27.5**	**≤ 25**	OK	FLAG COLM J DUE TO FIELD DUPE EXCEEDANCE
Hardness	OK / SM 2340B	NA	**NA**	3	**≤180**	≤1.0 mg/L 1.0 mg/L	103,108	**±25**	100	**±15**	0	**≤ 20**	D = 1	**≤ 10**	OK	NONE
DOC	OK / SM 5310B	6	**≤15**	6	**≤28**	≤1.0 mg/L 1.0 mg/L	87	**±25**	100	**±15**	3	**≤ 20**	6.1	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6	**≤28**	≤0.01 mg/L 0.01 mg/L	97	**±25**	94	**±20**	4	**≤ 20**	D = 0.001	**≤ 0.02**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	5	**≤28**	≤0.1 mg/L 0.1 mg/L	105,102	**±25**	106	**±20**	0.29,3.4	**≤ 20**	**D = 0.045**	**≤ 0.040**	OK	FLAG COLM J DUE TO FIELD DUPE 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 N. Maas

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

Date 12/5/2019 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 GC

Sample Date/Sample ID: 11/15/2019 /All locations, QA76 (COLM) Lab Ref No 1911-151

date 12/10/19

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**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	92,109	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	98,115	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤5	**≤15**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	82,84	**±25**	NR	**±15**	NC	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤5	**≤15**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	82,84	**±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**	0,1.9	**≤ 35**	**D = 11**	**≤ 2**	OK	FLAG COLM J DUE TO FIELD DUPE 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

December 23, 2019

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1912-101

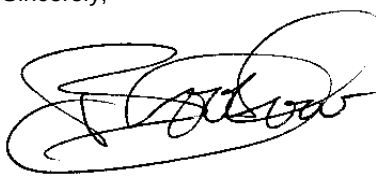
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on December 11, 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: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
Project: 14-05806-000

Case Narrative

Samples were collected on December 11, 2019 and received by the laboratory on December 11, 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: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
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-20191211**					
Laboratory ID:	12-101-01					
Total Suspended Solids	**2.0**	1.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**COUMI-20191211**					
Laboratory ID:	12-101-02					
Total Suspended Solids	**43**	2.5	SM 2540D	12-17-19	12-18-19	
Client ID:	**COUMO-20191211**					
Laboratory ID:	12-101-03					
Total Suspended Solids	**44**	2.5	SM 2540D	12-17-19	12-18-19	
Client ID:	**EVAMS-20191211**					
Laboratory ID:	12-101-04					
Total Suspended Solids	**4.4**	1.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**EVALSS-20191211**					
Laboratory ID:	12-101-05					
Total Suspended Solids	**11**	1.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**MONMN-20191211**					
Laboratory ID:	12-101-06					
Total Suspended Solids	**9.4**	1.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**MONMS-20191211**					
Laboratory ID:	12-101-07					
Total Suspended Solids	**5.2**	1.0	SM 2540D	12-17-19	12-18-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
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-20191211**					
Laboratory ID:	12-101-08					
Total Suspended Solids	**14**	1.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**SEIMN-20191211**					
Laboratory ID:	12-101-09					
Total Suspended Solids	**17**	1.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**SEIMS-20191211**					
Laboratory ID:	12-101-10					
Total Suspended Solids	**12**	2.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**TOSMI-20191211**					
Laboratory ID:	12-101-11					
Total Suspended Solids	**60**	2.5	SM 2540D	12-17-19	12-18-19	
Client ID:	**TOSMO-20191211**					
Laboratory ID:	12-101-12					
Total Suspended Solids	**71**	2.5	SM 2540D	12-17-19	12-18-19	
Client ID:	**TYLMI-20191211**					
Laboratory ID:	12-101-13					
Total Suspended Solids	**15**	2.0	SM 2540D	12-17-19	12-18-19	
Client ID:	**TYLMO-20191211**					
Laboratory ID:	12-101-14					
Total Suspended Solids	**10**	2.0	SM 2540D	12-17-19	12-18-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
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:	**QA7720191211**					
Laboratory ID:	12-101-15					
Total Suspended Solids	**11**	2.0	SM 2540D	12-17-19	12-18-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
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:	MB1217W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	12-17-19	12-18-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-101-12								
	ORIG	DUP							
Total Suspended Solids	**71.0**	**64.0**	NA	NA	NA	NA	10	23	
SPIKE BLANK									
Laboratory ID:	SB1217W1								
	SB		SB		SB				
Total Suspended Solids	**84.0**		100	NA	84	69-122	NA	NA	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20191211**					
Laboratory ID:	12-101-01					
Turbidity	**1.8**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**COUMI-20191211**					
Laboratory ID:	12-101-02					
Turbidity	**28**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**COUMO-20191211**					
Laboratory ID:	12-101-03					
Turbidity	**25**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**EVAMS-20191211**					
Laboratory ID:	12-101-04					
Turbidity	**2.4**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**EVALSS-20191211**					
Laboratory ID:	12-101-05					
Turbidity	**4.8**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**MONMN-20191211**					
Laboratory ID:	12-101-06					
Turbidity	**5.4**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**MONMS-20191211**					
Laboratory ID:	12-101-07					
Turbidity	**3.9**	0.10	EPA 180.1	12-12-19	12-12-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20191211**					
Laboratory ID:	12-101-08					
Turbidity	**8.4**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**SEIMN-20191211**					
Laboratory ID:	12-101-09					
Turbidity	**6.8**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**SEIMS-20191211**					
Laboratory ID:	12-101-10					
Turbidity	**5.8**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**TOSMI-20191211**					
Laboratory ID:	12-101-11					
Turbidity	**32**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**TOSMO-20191211**					
Laboratory ID:	12-101-12					
Turbidity	**30**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**TYLMI-20191211**					
Laboratory ID:	12-101-13					
Turbidity	**9.5**	0.10	EPA 180.1	12-12-19	12-12-19	
Client ID:	**TYLMO-20191211**					
Laboratory ID:	12-101-14					
Turbidity	**7.8**	0.10	EPA 180.1	12-12-19	12-12-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA7720191211**					
Laboratory ID:	12-101-15					
Turbidity	**7.8**	0.10	EPA 180.1	12-12-19	12-12-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
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	12-12-19	12-12-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-096-01								
	ORIG	DUP							
Turbidity	**32.6**	**32.7**	NA	NA	NA	NA	0	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-20191211**					
Laboratory ID:	12-101-01					
Hardness	**14**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**COUMI-20191211**					
Laboratory ID:	12-101-02					
Hardness	**87**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**COUMO-20191211**					
Laboratory ID:	12-101-03					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**EVAMS-20191211**					
Laboratory ID:	12-101-04					
Hardness	**81**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**EVALSS-20191211**					
Laboratory ID:	12-101-05					
Hardness	**76**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**MONMN-20191211**					
Laboratory ID:	12-101-06					
Hardness	**61**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**MONMS-20191211**					
Laboratory ID:	12-101-07					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	

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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:	**MONM-20191211**					
Laboratory ID:	12-101-08					
Hardness	**68**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**SEIMN-20191211**					
Laboratory ID:	12-101-09					
Hardness	**25**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**SEIMS-20191211**					
Laboratory ID:	12-101-10					
Hardness	**43**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**TOSMI-20191211**					
Laboratory ID:	12-101-11					
Hardness	**67**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**TOSMO-20191211**					
Laboratory ID:	12-101-12					
Hardness	**72**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**TYLMI-20191211**					
Laboratory ID:	12-101-13					
Hardness	**52**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	
Client ID:	**TYLMO-20191211**					
Laboratory ID:	12-101-14					
Hardness	**34**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	

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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:	**QA7720191211**					
Laboratory ID:	12-101-15					
Hardness	**32**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	

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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:	MB1217WH2					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	12-17-19	12-18-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-101-01										
	ORIG	DUP									
Hardness	**13.9**	**13.0**	NA		NA	NA		NA	7	20	
MATRIX SPIKES											
Laboratory ID:	12-101-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**140**	**137**	132	132	13.9	96	93	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB1217WH2										
	SB		SB			SB					
Hardness	**125**		132		NA	95		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-20191211**					
Laboratory ID:	12-101-01					
Dissolved Organic Carbon	**16**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**COUMI-20191211**					
Laboratory ID:	12-101-02					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**COUMO-20191211**					
Laboratory ID:	12-101-03					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**EVAMS-20191211**					
Laboratory ID:	12-101-04					
Dissolved Organic Carbon	**6.4**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**EVALSS-20191211**					
Laboratory ID:	12-101-05					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**MONMN-20191211**					
Laboratory ID:	12-101-06					
Dissolved Organic Carbon	**5.4**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**MONMS-20191211**					
Laboratory ID:	12-101-07					
Dissolved Organic Carbon	**6.3**	1.0	SM 5310B	12-18-19	12-18-19	

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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:	**MONM-20191211**					
Laboratory ID:	12-101-08					
Dissolved Organic Carbon	**5.4**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**SEIMN-20191211**					
Laboratory ID:	12-101-09					
Dissolved Organic Carbon	**8.3**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**SEIMS-20191211**					
Laboratory ID:	12-101-10					
Dissolved Organic Carbon	**7.5**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**TOSMI-20191211**					
Laboratory ID:	12-101-11					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**TOSMO-20191211**					
Laboratory ID:	12-101-12					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**TYLMI-20191211**					
Laboratory ID:	12-101-13					
Dissolved Organic Carbon	**6.7**	1.0	SM 5310B	12-18-19	12-18-19	
Client ID:	**TYLMO-20191211**					
Laboratory ID:	12-101-14					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	12-18-19	12-18-19	

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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:	**QA7720191211**					
Laboratory ID:	12-101-15					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	12-18-19	12-18-19	

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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:	MB1218D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	12-18-19	12-18-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-101-12								
	ORIG	DUP							
Dissolved Organic Carbon	**4.28**	**4.27**	NA	NA	NA	NA	0	15	
MATRIX SPIKE									
Laboratory ID:	12-101-12								
	MS		MS		MS				
Dissolved Organic Carbon	**14.6**		10.0	4.28	103	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1218D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.2**		10.0	NA	112	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-20191211**					
Laboratory ID:	12-101-01					
Total Phosphorus	**0.020**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**COUMI-20191211**					
Laboratory ID:	12-101-02					
Total Phosphorus	**0.16**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**COUMO-20191211**					
Laboratory ID:	12-101-03					
Total Phosphorus	**0.13**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**EVAMS-20191211**					
Laboratory ID:	12-101-04					
Total Phosphorus	**0.024**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**EVALSS-20191211**					
Laboratory ID:	12-101-05					
Total Phosphorus	**0.045**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**MONMN-20191211**					
Laboratory ID:	12-101-06					
Total Phosphorus	**0.046**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**MONMS-20191211**					
Laboratory ID:	12-101-07					
Total Phosphorus	**0.051**	0.010	EPA 365.1	12-18-19	12-19-19	

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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:	**MONM-20191211**					
Laboratory ID:	12-101-08					
Total Phosphorus	**0.071**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**SEIMN-20191211**					
Laboratory ID:	12-101-09					
Total Phosphorus	**0.054**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**SEIMS-20191211**					
Laboratory ID:	12-101-10					
Total Phosphorus	**0.064**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**TOSMI-20191211**					
Laboratory ID:	12-101-11					
Total Phosphorus	**0.12**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**TOSMO-20191211**					
Laboratory ID:	12-101-12					
Total Phosphorus	**0.10**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**TYLMI-20191211**					
Laboratory ID:	12-101-13					
Total Phosphorus	**0.074**	0.010	EPA 365.1	12-18-19	12-19-19	
Client ID:	**TYLMO-20191211**					
Laboratory ID:	12-101-14					
Total Phosphorus	**0.049**	0.010	EPA 365.1	12-18-19	12-19-19	

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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:	**QA7720191211**					
Laboratory ID:	12-101-15					
Total Phosphorus	**0.045**	0.010	EPA 365.1	12-18-19	12-19-19	

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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:	MB1218W2					
Total Phosphorus	**ND**	0.010	EPA 365.1	12-18-19	12-19-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-101-01								
	ORIG	DUP							
Total Phosphorus	**0.0197**	**0.0183**	NA	NA	NA	NA	7	14	
MATRIX SPIKE									
Laboratory ID:	12-101-01								
	MS		MS		MS				
Total Phosphorus	**0.247**		0.250	0.0197	91	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1218W2								
	SB		SB		SB				
Total Phosphorus	**0.230**		0.250	NA	92	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-20191211**					
Laboratory ID:	12-101-01					
Copper	**ND**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**COUMI-20191211**					
Laboratory ID:	12-101-02					
Copper	**4.2**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**30**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**COUMO-20191211**					
Laboratory ID:	12-101-03					
Copper	**5.2**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**45**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**EVAMS-20191211**					
Laboratory ID:	12-101-04					
Copper	**ND**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**EVALSS-20191211**					
Laboratory ID:	12-101-05					
Copper	**ND**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**MONMN-20191211**					
Laboratory ID:	12-101-06					
Copper	**1.3**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**MONMS-20191211**					
Laboratory ID:	12-101-07					
Copper	**1.4**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	

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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-20191211**					
Laboratory ID:	12-101-08					
Copper	**1.5**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**31**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**SEIMN-20191211**					
Laboratory ID:	12-101-09					
Copper	**1.2**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**SEIMS-20191211**					
Laboratory ID:	12-101-10					
Copper	**ND**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**TOSMI-20191211**					
Laboratory ID:	12-101-11					
Copper	**6.3**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**1700**	130	EPA 200.8	12-13-19	12-18-19	
Client ID:	**TOSMO-20191211**					
Laboratory ID:	12-101-12					
Copper	**4.8**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**600**	130	EPA 200.8	12-13-19	12-18-19	
Client ID:	**TYLMI-20191211**					
Laboratory ID:	12-101-13					
Copper	**4.2**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**12**	5.0	EPA 200.8	12-13-19	12-18-19	
Client ID:	**TYLMO-20191211**					
Laboratory ID:	12-101-14					
Copper	**3.7**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**13**	5.0	EPA 200.8	12-13-19	12-18-19	

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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:	**QA7720191211**					
Laboratory ID:	12-101-15					
Copper	**3.8**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**14**	5.0	EPA 200.8	12-13-19	12-18-19	

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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:	MB1313WH2					
Copper	**ND**	1.0	EPA 200.8	12-13-19	12-18-19	
Zinc	**ND**	5.0	EPA 200.8	12-13-19	12-18-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-101-05										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	12-101-05										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**89.0**	**90.4**	100	100	ND	**89**	**90**	75-125	2	20	
Zinc	**100**	**104**	100	100	ND	**100**	**104**	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-20191211**					
Laboratory ID:	12-101-01					
Copper	**ND**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	
Client ID:	**COUMI-20191211**					
Laboratory ID:	12-101-02					
Copper	**1.7**	1.0	EPA 200.8		12-18-19	
Zinc	**6.6**	5.0	EPA 200.8		12-18-19	
Client ID:	**COUMO-20191211**					
Laboratory ID:	12-101-03					
Copper	**2.0**	1.0	EPA 200.8		12-18-19	
Zinc	**16**	5.0	EPA 200.8		12-18-19	
Client ID:	**EVAMS-20191211**					
Laboratory ID:	12-101-04					
Copper	**ND**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	
Client ID:	**EVALSS-20191211**					
Laboratory ID:	12-101-05					
Copper	**ND**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	
Client ID:	**MONMN-20191211**					
Laboratory ID:	12-101-06					
Copper	**ND**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	
Client ID:	**MONMS-20191211**					
Laboratory ID:	12-101-07					
Copper	**1.0**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	

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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:	**MONM-20191211**					
Laboratory ID:	12-101-08					
Copper	**ND**	1.0	EPA 200.8		12-18-19	
Zinc	**17**	5.0	EPA 200.8		12-18-19	
Client ID:	**SEIMN-20191211**					
Laboratory ID:	12-101-09					
Copper	**ND**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	
Client ID:	**SEIMS-20191211**					
Laboratory ID:	12-101-10					
Copper	**ND**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	
Client ID:	**TOSMI-20191211**					
Laboratory ID:	12-101-11					
Copper	**2.4**	1.0	EPA 200.8		12-18-19	
Zinc	**1200**	50	EPA 200.8		12-18-19	
Client ID:	**TOSMO-20191211**					
Laboratory ID:	12-101-12					
Copper	**1.7**	1.0	EPA 200.8		12-18-19	
Zinc	**470**	25	EPA 200.8		12-18-19	
Client ID:	**TYLMI-20191211**					
Laboratory ID:	12-101-13					
Copper	**2.7**	1.0	EPA 200.8		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	
Client ID:	**TYLMO-20191211**					
Laboratory ID:	12-101-14					
Copper	**2.3**	1.0	EPA 200.8		12-18-19	
Zinc	**6.5**	5.0	EPA 200.8		12-18-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
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:	**QA7720191211**					
Laboratory ID:	12-101-15					
Copper	**2.4**	1.0	EPA 200.8		12-18-19	
Zinc	**6.9**	5.0	EPA 200.8		12-18-19	

Date of Report: December 23, 2019
Samples Submitted: December 11, 2019
Laboratory Reference: 1912-101
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		12-18-19	
Zinc	**ND**	5.0	EPA 200.8		12-18-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-101-15										
	ORIG	DUP									
Copper	**2.38**	**2.46**	NA	NA		NA		NA	3	20	
Zinc	**6.92**	**6.56**	NA	NA		NA		NA	5	20	
MATRIX SPIKES											
Laboratory ID:	12-101-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**75.8**	**71.2**	80.0	80.0	2.38	**92**	**86**	75-125	6	20	
Zinc	**82.4**	**77.2**	80.0	80.0	6.92	**94**	**88**	75-125	7	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 23 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-20191211	Water	19-A020298	Micro, NUT
COUMI-20191211	Water	19-A020299	Micro, NUT
COUMO-20191211	Water	19-A020300	Micro, NUT
EVAMS-20191211	Water	19-A020301	Micro, NUT
EVALSS-20191211	Water	19-A020302	Micro, NUT
MONMN-20191211	Water	19-A020303	Micro, NUT
MONMS-20191211	Water	19-A020304	Micro, NUT
MONM-20191211	Water	19-A020305	Micro, NUT
SEIMN-20191211	Water	19-A020306	Micro, NUT
SEIMS-20191211	Water	19-A020307	Micro, NUT
TOSMI-20191211	Water	19-A020308	Micro, NUT
TOSMO-20191211	Water	19-A020309	Micro, NUT
TYLMI-20191211	Water	19-A020310	Micro, NUT
TYLMO-20191211	Water	19-A020311	Micro, NUT
QA77-20191211	Water	19-A020312	Micro, NUT

Your samples were received on Thursday, December 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

Dec 23 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: 12-101

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: 12-101
All results reported on an as received basis.

Date Received: 12/12/19
Date Reported: 12/23/19

AMTEST Identification Number **19-A020298**
Client Identification **COLM-20191211**
Sampling Date **12/11/19, 19:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	< 0.2	mg/l		0.1			
Total Nitrogen (TKN)	< 0.2	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.023	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020299**
Client Identification **COUMI-20191211**
Sampling Date **12/11/19, 17:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	300	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.778	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.10	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020300**
Client Identification **COUMO-20191211**
Sampling Date **12/11/19, 17:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	5100	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.534	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.21	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020301**
Client Identification **EVAMS-20191211**
Sampling Date **12/11/19, 18:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	33.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	2.10	mg/l		0.1			
Total Nitrogen (TKN)	0.500	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	1.6	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020302**
Client Identification **EVALSS-20191211**
Sampling Date **12/11/19, 18:12**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	420	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	1.40	mg/l		0.1			
Total Nitrogen (TKN)	0.471	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.93	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020303**
Client Identification **MONMN-20191211**
Sampling Date **12/11/19, 19:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.45	mg/l		0.1			
Total Nitrogen (TKN)	0.451	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020304**
Client Identification **MONMS-20191211**
Sampling Date **12/11/19, 19:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	9.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.69	mg/l		0.1			
Total Nitrogen (TKN)	0.491	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.20	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020305**
Client Identification **MONM-20191211**
Sampling Date **12/11/19, 19:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	86.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.60	mg/l		0.1			
Total Nitrogen (TKN)	0.510	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.092	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020306**
Client Identification **SEIMN-20191211**
Sampling Date **12/11/19, 18:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.55	mg/l		0.1			
Total Nitrogen (TKN)	0.472	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.081	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020307**
Client Identification **SEIMS-20191211**
Sampling Date **12/11/19, 20:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	22.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.64	mg/l		0.1			
Total Nitrogen (TKN)	0.485	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020308**
Client Identification **TOSMI-20191211**
Sampling Date **12/11/19, 17:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	62.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.89	mg/l		0.1			
Total Nitrogen (TKN)	0.616	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020309**
Client Identification **TOSMO-20191211**
Sampling Date **12/11/19, 17:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	98.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.78	mg/l		0.1			
Total Nitrogen (TKN)	0.539	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020310**
Client Identification **TYLMI-20191211**
Sampling Date **12/11/19, 18:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	76.	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.542	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.20	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020311**
Client Identification **TYLMO-20191211**
Sampling Date **12/11/19, 18:15**

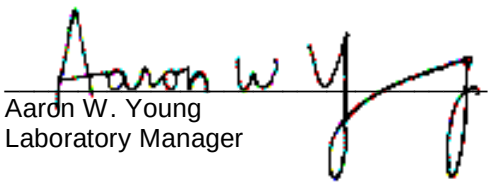
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	580	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.461	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.074	mg/l		0.02	SM4500NO3	SH	12/16/19

AMTEST Identification Number **19-A020312**
Client Identification **QA77-20191211**
Sampling Date **12/11/19, 18:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	600	CFU/100 ml		1	SM 9222D	AG	12/12/19
Total Nitrogen (NOX&TKN)	0.51	mg/l		0.1			
Total Nitrogen (TKN)	0.417	mg/l		0.2	SM4500N	SH	12/17/19
Total Nitrate + Nitrite	0.093	mg/l		0.02	SM4500NO3	SH	12/16/19



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
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Professional Analytical Services

QC Summary for sample numbers: 19-A020298 to 19-A020312

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A020300	Fecal coliform	CFU/100 ml	5100	5700	11.
19-A020307	Fecal coliform	CFU/100 ml	22.	25.	13.
19-A020031	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
19-A020126	Total Nitrogen (TKN)	mg/l	0.816	0.818	0.24
19-A020298	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
19-A020308	Total Nitrogen (TKN)	mg/l	0.616	0.657	6.4
19-A020312	Total Nitrogen (TKN)	mg/l	0.417	0.439	5.1
19-A020137	Total Nitrate + Nitrite	mg/l	0.37	0.31	18.
19-A020139	Total Nitrate + Nitrite	mg/l	0.48	0.51	6.1
19-A020280	Total Nitrate + Nitrite	mg/l	0.82	0.89	8.2
19-A020299	Total Nitrate + Nitrite	mg/l	0.10	0.094	6.2
19-A020309	Total Nitrate + Nitrite	mg/l	0.24	0.24	0.00
19-A020322	Total Nitrate + Nitrite	mg/l	1.1	1.1	0.00

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A020031	Total Nitrogen (TKN)	mg/l	< 0.2	2.17	2.00	108.50 %
19-A020126	Total Nitrogen (TKN)	mg/l	0.816	2.79	2.00	98.70 %
19-A020298	Total Nitrogen (TKN)	mg/l	< 0.2	2.02	2.00	101.00 %
19-A020308	Total Nitrogen (TKN)	mg/l	0.616	2.63	2.00	100.70 %
19-A020312	Total Nitrogen (TKN)	mg/l	0.417	2.42	2.00	100.15 %
19-A020137	Total Nitrate + Nitrite	mg/l	0.37	1.2	1.0	83.00 %
19-A020139	Total Nitrate + Nitrite	mg/l	0.48	1.6	1.0	112.00 %
19-A020280	Total Nitrate + Nitrite	mg/l	0.82	1.8	1.0	98.00 %
19-A020299	Total Nitrate + Nitrite	mg/l	0.10	1.0	1.0	90.00 %
19-A020309	Total Nitrate + Nitrite	mg/l	0.24	1.2	1.0	96.00 %
19-A020322	Total Nitrate + Nitrite	mg/l	1.1	10.	10.	89.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.992	99.2 %
Total Nitrogen (TKN)	mg/l	1.00	1.01	101. %
Total Nitrate + Nitrite	mg/l	1.0	0.91	91.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.96	96.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %

QC Summary for sample numbers: 19-A020298 to 19-A020312...

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

OnSite Environmental Inc.

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

Laboratory Reference #: 12-101

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-20191211 20298	12/11/19	19:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20191211 99	12/11/19	17:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20191211 20300	12/11/19	17:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20191211 01	12/11/19	18:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20191211 02	12/11/19	18:12	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20191211 03	12/11/19	19:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20191211 04	12/11/19	19:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20191211 05	12/11/19	19:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20191211 06	12/11/19	18:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20191211 07	12/11/19	20:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	[signature]	OSE	12/12/19	8:35	
Received by:	[signature]	AmTest	12/12/19	8:35	**EDDs - CSV**
Relinquished by:					**Reporting Limits:**
Received by:					**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:					**Total Nitrogen - .10 mg/L**
Received by:					

T=4.4

OnSite Environmental Inc.

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

Laboratory Reference #: 12-101

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-20191211 20308	12/11/19	17:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20191211 09	12/11/19	17:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20191211 10	12/11/19	18:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20191211 11	12/11/19	18:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA77-20191211 12	12/11/19	18:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Fe	12/12/19	835	
Received by:	AmTest	12/12/19	835	**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

12-101

Page 1 of 1

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.

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 1211	12/11/19	1935	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019		17:20	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019		17:05	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019		1800	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019		18:12	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019		19:20	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019		19:00	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019		19:40	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019		18:55	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019		20:30	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019		17:15	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019		17:40	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019		18:40	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019		18:15	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 7720191211	12/11/19	18:25	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Kyle Bliss Date 12/11/19 Received by _____ Date 12/11/19

Firm HEC Time 21:00 Firm _____ Time 21:00

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

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

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

12-101

Page 1 of 1

Company: Herrera Enyironmental 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.

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 1211	12/11/19	1935	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2019		1720	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2019		1705	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2019		1800	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2019		1812	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2019		1920	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2019		1900	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2019		1940	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2019		1855	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2019		2030	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2019		1715	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2019		1740	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2019		1840	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2019		1815	Water	7	X	X	X	X	X	X	X	X	X			
	QA7720191211	12/11/19	1825	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Kyle Bliss Date 12-11-19 Received by _____ Date 12/11/19

Firm HEC Time 21:00 Firm OnSite Time 21:00

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:	951 Pro DSS #1
Date/Time:	12.11.19 @ 12:30
Barometric Pressure Start of Day:	mmHg: 763.4 Time: 12:30
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	4.8	0	20.6	w/ Herrera DI water
Conductivity (µS/cm)	1002	1,000	22.7	
Conductivity (µS/cm)	101.5	100	22.8	
DO % Saturation	99.4	100	22.0	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.1	0	21.0	
Conductivity (µS/cm)	96.9	100	23.0	
DO % Saturation	100.7	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:	12.11.19 @ 12:30
Barometric Pressure Start of Day:	mmHg: 763.7 Time: 12:30
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	~~4~~ 3.7	0	21.2	w/ Herrera DI water
Conductivity (µS/cm)	1008	1,000	22.6	
Conductivity (µS/cm)	102.4	100	23.1	
DO % Saturation	103.6	100	22.6	calibrated New: 100.5

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.0	0	22.4°	
Conductivity (µS/cm)	94.6	100	21.8	
DO % Saturation	101.0	100	18.9	

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.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB/NL

Sample Date: 12/11/2019 **Sample Time:** 1935 PDT: PST: X

Base Flow or (Storm) Event? **Field Filtered Time:** 1940

(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, MID 40s

Water Quality Sampling

Sample ID: COLM-2019

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:	Brown (tannins)
Odor:	None
Sheen:	None
Floatables:	None

LABORATORY DELIVERY

Date: 12/11/2019 **Time:**

Quality Assurance

Checked By: I Lentz **Signature:**

Date Checked: 12/30/19 **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): 5.71

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.3

Specific Conductivity (µs/cm) 42.0

Dissolved Oxygen (mg/L) 11.47

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMY GK

Sample Date: 12/11/19 **Sample Time:** 17:20 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 17:25 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 45°

Water Quality Sampling

Sample ID: COUM1 20191211

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 / little turbid

Color: light yellow / brown

Odor: NA

Sheen: NA

Floatables: small amount

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: 12/30/19 **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): 2.60

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.9

Specific Conductivity (µs/cm) 198.6

Dissolved Oxygen (mg/L) 11.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH, GK

Sample Date: 12/11/19 **Sample Time:** 17:05 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 17:10 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 + 45°

Water Quality Sampling

Sample ID: COUMO 20191211

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: NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

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

Date Checked: 12/30/19 **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): 2.95

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.2

Specific Conductivity (µs/cm) 125.3

Dissolved Oxygen (mg/L) 11.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL / KB

Sample Date: 12/11/2019 **Sample Time:** 1800 PDT: PST: X

Base Flow or (Storm) Event? **Field Filtered Time:** 1805

(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, Mid 40s

Water Quality Sampling

Sample ID: EVAMS-2019

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:	SLIGHTLY BROWN
Odor:	NONE
Sheen:	NONE
Floatables:	NONE

LABORATORY DELIVERY

Date: 12/11/2019 **Time:**

Quality Assurance

Checked By: J. Lautz **Signature:**

Date Checked: 12/30/19 **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) 8.0

Specific Conductivity (µs/cm) 199.4

Dissolved Oxygen (mg/L) 11.49

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/KB

Sample Date: 12/11/2019 **Sample Time:** 18:12 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 18:17
(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, MID 40s

Water Quality Sampling

Sample ID: EVALSS-2019

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:	LIGHT BROWN
Odor:	NONE
Sheen:	NONE
Floatables:	NONE

LABORATORY DELIVERY

Date: 12/11/2019 **Time:**

Quality Assurance

Checked By: S. Loyttle **Signature:**

Date Checked: 12/30/19 **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): 2.365

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.1

Specific Conductivity (µs/cm) 185.0

Dissolved Oxygen (mg/L) 11.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMM GK

Sample Date: 20191211 **Sample Time:** 19:20 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 19:25 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: 43° + Rainy

Water Quality Sampling

Sample ID: MONMN 20191211

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: pretty clear

Color: light yellow

Odor: NA

Sheen: NA

Floatables: yes some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lemyk **Signature:**

Date Checked: 12/30/19 **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): 0.25

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.9

Specific Conductivity (µs/cm) 146.6

Dissolved Oxygen (mg/L) 11.53

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH, CK

Sample Date: 20191211 **Sample Time:** 19:00 PDT

Base Flow or Storm Event? (Base Flow) **Field Filtered Time:** 19:05 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 +45°

Water Quality Sampling

Sample ID: MONMS20191211

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: pretty clear

Color: a bit yellow

Odor: ~~NA~~ NA

Sheen: NA

Floatables: NA

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lewitus **Signature:**

Date Checked: 12/30/19 **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): 6.75

Reference Point (description): inside of well cap in vault

Water Quality Measurments

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 251.2

Dissolved Oxygen (mg/L) 8.88

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK, MMH

Sample Date: [redacted] 20191211 **Sample Time:** 19.40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 19:45 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: RAIN / + 45°

Water Quality Sampling

Sample ID: MONM20191211

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: yellow

Odor: NA

Sheen: NA

Floatables: yes

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: [redacted] **Signature:**

Date Checked: 12/30/19 **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) [redacted] 7

Specific Conductivity (µs/cm) 14.0

Dissolved Oxygen (mg/L) 10.6

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/KB

Sample Date: 12/11/2019 **Sample Time:** 18:55 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1900 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, MID 40s

Water Quality Sampling

Sample ID: SEIMN-2019

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: very light brown

Odor: NONE

Sheen: NONE

Floatables: NONE

LABORATORY DELIVERY

Date: 12/11/2019 **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~~

Stream Stage Measurement

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

Stream Stage (ft): 0.68

Reference Point (description): From top of bolt

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 66.0

Dissolved Oxygen (mg/L) 11.94

Quality Assurance

Checked By: [illegible] **Signature:**

Date Checked: 12/30/19 **Time:**

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

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/KB

Sample Date: 12/11/19 **Sample Time:** 2030 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 2035
(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, MID 40s

Water Quality Sampling

Sample ID: SEIMS-2019

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: 12/11/2019 **Time:**

Quality Assurance

Checked By: E. Leutel **Signature:**

Date Checked: 12/30/19 **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): ~~0.78~~ 0.78 NL

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.2

Specific Conductivity (µs/cm) 102.5

Dissolved Oxygen (mg/L) 11.23

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/KB

Sample Date: 12/11/2019 **Sample Time:** 17:15 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 17:20
(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, MID 40s

Water Quality Sampling

Sample ID: TOSM1-2019

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:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: 12/11/2019 **Time:**

Quality Assurance

Checked By: E. Leyth **Signature:**

Date Checked: 12/30/19 **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 NL

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.1

Specific Conductivity (µs/cm) 141.5

Dissolved Oxygen (mg/L) 11.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK, MMH

Sample Date: 20191211 **Sample Time:** 1740 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1745 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 +45°

Water Quality Sampling

Sample ID: TOSMO20191211

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: yellow

Odor: NA

Sheen: NA

Floatables: YES

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Gunter **Signature:**

Date Checked: 12/30/19 **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): 0.69

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.2

Specific Conductivity (µs/cm) 167.2

Dissolved Oxygen (mg/L) 11.63

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK, MMY

Sample Date: 2019 12 11 **Sample Time:** 18:40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 18:45 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: TYLMI20191211

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

Odor: NA

Sheen: NA

Floatables: yes

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: C. Lamb **Signature:**

Date Checked: 12/30/19 **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): 54.0 inches

Reference Point (description): measure down from top of culvert

Water Quality Measurments

Temperature (°C) 7.8

Specific Conductivity (µs/cm) 118.7

Dissolved Oxygen (mg/L) 11.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BK, MMH

QA 1625 1627

Sample Date: 20191211 **Sample Time:** 18:15 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 18:29 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: RAINY + 45°

Water Quality Sampling

Sample ID: TYLMO 20191211

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:	QA 77 20191211
Filter blank sample ID:	
Transfer blank sample ID:	1

Visual and Olfactory Conditions:

Clarity:	clear
Color:	light yellowish
Odor:	NA
Sheen:	NA
Floatables:	some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Loyd **Signature:**

Date Checked: 12/30/19 **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): 33.0 inches

Reference Point (description): Down from top of culvert

Water Quality Measurments

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 84.1

Dissolved Oxygen (mg/L) 11.58

Data Quality Assurance Worksheet

By N.Maas

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

Date 12/30/2019 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: 12/11/2019 /All locations, QA77 (TYLMO) Lab Ref No 1912-101

date 12/30/2019

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**	7	**≤7**	≤1.0 mg/L 1.0 mg/L	NA	**NA**	84	**±20**	10	**≤ 25**	9.5	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	0	**≤ 25**	0	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	7	**≤180**	≤1.0 mg/L 1.0 mg/L	93,96	**±25**	95	**±15**	7	**≤ 20**	6.1	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	7	**≤15**	7	**≤28**	≤1.0 mg/L 1.0 mg/L	103	**±25**	112	**±15**	0	**≤ 20**	D = 0.10	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	8	**≤28**	≤0.01 mg/L 0.01 mg/L	91	**±25**	92	**±20**	7	**≤ 20**	D = 0.004	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	6	**≤28**	≤0.1 mg/L 0.1 mg/L	99-108	**±25**	99, 101	**±20**	0.24-6.4	**≤ 20**	D = 0.044	**≤ 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 N.Maas

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

Date 12/30/2019 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: 12/11/2019 /All locations, QA77 (TYLMO) Lab Ref No 1912-101

date 12/30/2019

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**	7	**≤180**	≤1.0 µg/L 1.0 µg/L	89,90	**±25**	NR	**±15**	NC	**≤ 20**	D = 0.10	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	100,104	**±25**	NR	**±15**	NC	**≤ 20**	D = 1.0	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	7	**≤15**	7	**≤180**	≤1.0 µg/L 1.0 µg/L	86,92	**±25**	NR	**±15**	NC	**≤ 20**	D = 0.10	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	7	**≤15**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	88,94	**±25**	NR	**±15**	NC	**≤ 20**	D = 0.40	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	11,13	**≤ 35**	3.4	**≤ 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

January 10, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1912-209

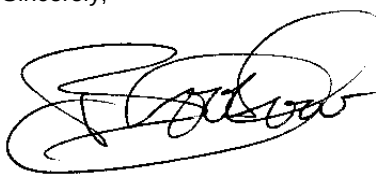
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on December 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: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
Project: 14-05806-000

Case Narrative

Samples were collected on December 19, 2019 and received by the laboratory on December 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.

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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-20191219**					
Laboratory ID:	12-209-01					
Total Suspended Solids	**31**	2.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**COUMI-20191219**					
Laboratory ID:	12-209-02					
Total Suspended Solids	**310**	5.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**COUMO-20191219**					
Laboratory ID:	12-209-03					
Total Suspended Solids	**97**	2.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**EVAMS-20191219**					
Laboratory ID:	12-209-04					
Total Suspended Solids	**32**	5.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**EVALSS-20191219**					
Laboratory ID:	12-209-05					
Total Suspended Solids	**290**	5.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**MONMN-20191219**					
Laboratory ID:	12-209-06					
Total Suspended Solids	**64**	2.5	SM 2540D	12-23-19	12-24-19	
Client ID:	**MONMS-20191219**					
Laboratory ID:	12-209-07					
Total Suspended Solids	**11**	1.0	SM 2540D	12-23-19	12-24-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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-20191219**					
Laboratory ID:	12-209-08					
Total Suspended Solids	**61**	2.5	SM 2540D	12-23-19	12-24-19	
Client ID:	**SEIMN-20191219**					
Laboratory ID:	12-209-09					
Total Suspended Solids	**220**	5.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**SEIMS-20191219**					
Laboratory ID:	12-209-10					
Total Suspended Solids	**96**	5.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**TOSMI-20191219**					
Laboratory ID:	12-209-11					
Total Suspended Solids	**110**	2.5	SM 2540D	12-23-19	12-24-19	
Client ID:	**TOSMO-20191219**					
Laboratory ID:	12-209-12					
Total Suspended Solids	**240**	5.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**TYLMI-20191219**					
Laboratory ID:	12-209-13					
Total Suspended Solids	**82**	5.0	SM 2540D	12-23-19	12-24-19	
Client ID:	**TYLMO-20191219**					
Laboratory ID:	12-209-14					
Total Suspended Solids	**57**	2.5	SM 2540D	12-23-19	12-24-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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:	**QA78-20191219**					
Laboratory ID:	12-209-15					
Total Suspended Solids	**230**	2.5	SM 2540D	12-23-19	12-24-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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:	MB1223W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	12-23-19	12-24-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-209-02								
	ORIG	DUP							
Total Suspended Solids	**307**	**322**	NA	NA	NA	NA	5	23	
SPIKE BLANK									
Laboratory ID:	SB1223W2								
	SB		SB		SB				
Total Suspended Solids	**82.0**		100	NA	82	69-122	NA	NA	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20191219**					
Laboratory ID:	12-209-01					
Turbidity	**6.6**	0.10	EPA 180.1	12-20-19	12-20-19	
Client ID:	**COUMI-20191219**					
Laboratory ID:	12-209-02					
Turbidity	**160**	0.50	EPA 180.1	12-20-19	12-20-19	
Client ID:	**COUMO-20191219**					
Laboratory ID:	12-209-03					
Turbidity	**55**	0.20	EPA 180.1	12-20-19	12-20-19	
Client ID:	**EVAMS-20191219**					
Laboratory ID:	12-209-04					
Turbidity	**23**	0.10	EPA 180.1	12-20-19	12-20-19	
Client ID:	**EVALSS-20191219**					
Laboratory ID:	12-209-05					
Turbidity	**78**	0.50	EPA 180.1	12-20-19	12-20-19	
Client ID:	**MONMN-20191219**					
Laboratory ID:	12-209-06					
Turbidity	**36**	0.10	EPA 180.1	12-20-19	12-20-19	
Client ID:	**MONMS-20191219**					
Laboratory ID:	12-209-07					
Turbidity	**10**	0.10	EPA 180.1	12-20-19	12-20-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20191219**					
Laboratory ID:	12-209-08					
Turbidity	**41**	0.20	EPA 180.1	12-20-19	12-20-19	
Client ID:	**SEIMN-20191219**					
Laboratory ID:	12-209-09					
Turbidity	**100**	0.50	EPA 180.1	12-20-19	12-20-19	
Client ID:	**SEIMS-20191219**					
Laboratory ID:	12-209-10					
Turbidity	**49**	0.50	EPA 180.1	12-20-19	12-20-19	
Client ID:	**TOSMI-20191219**					
Laboratory ID:	12-209-11					
Turbidity	**55**	0.20	EPA 180.1	12-20-19	12-20-19	
Client ID:	**TOSMO-20191219**					
Laboratory ID:	12-209-12					
Turbidity	**110**	0.50	EPA 180.1	12-20-19	12-20-19	
Client ID:	**TYLMI-20191219**					
Laboratory ID:	12-209-13					
Turbidity	**40**	0.50	EPA 180.1	12-20-19	12-20-19	
Client ID:	**TYLMO-20191219**					
Laboratory ID:	12-209-14					
Turbidity	**34**	0.20	EPA 180.1	12-20-19	12-20-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 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:	**QA78-20191219**					
Laboratory ID:	12-209-15					
Turbidity	**110**	0.50	EPA 180.1	12-20-19	12-20-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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:	MB1220W1					
Turbidity	**ND**	0.10	EPA 180.1	12-20-19	12-20-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-216-01								
	ORIG	DUP							
Turbidity	**15.3**	**15.0**	NA	NA	NA	NA	2	15	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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-20191219**					
Laboratory ID:	12-209-01					
Hardness	**13**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**COUMI-20191219**					
Laboratory ID:	12-209-02					
Hardness	**71**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**COUMO-20191219**					
Laboratory ID:	12-209-03					
Hardness	**39**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**EVAMS-20191219**					
Laboratory ID:	12-209-04					
Hardness	**74**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**EVALSS-20191219**					
Laboratory ID:	12-209-05					
Hardness	**75**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**MONMN-20191219**					
Laboratory ID:	12-209-06					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**MONMS-20191219**					
Laboratory ID:	12-209-07					
Hardness	**56**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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-20191219**					
Laboratory ID:	12-209-08					
Hardness	**50**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**SEIMN-20191219**					
Laboratory ID:	12-209-09					
Hardness	**28**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**SEIMS-20191219**					
Laboratory ID:	12-209-10					
Hardness	**37**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**TOSMI-20191219**					
Laboratory ID:	12-209-11					
Hardness	**36**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**TOSMO-20191219**					
Laboratory ID:	12-209-12					
Hardness	**47**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**TYLMI-20191219**					
Laboratory ID:	12-209-13					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	
Client ID:	**TYLMO-20191219**					
Laboratory ID:	12-209-14					
Hardness	**26**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	

Date of Report: January 10, 2020
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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:	**QA78-20191219**					
Laboratory ID:	12-209-15					
Hardness	**48**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 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:	MB1224WH2					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	12-24-19	12-26-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-175-01										
	ORIG	DUP									
Hardness	**82.4**	**83.7**	NA		NA	NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	12-175-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**212**	**217**	132	132	82.4	98	102	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB1224WH2										
	SB		SB			SB					
Hardness	**137**		132		NA	104		85-115	NA	NA	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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-20191219**					
Laboratory ID:	12-209-01					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**COUMI-20191219**					
Laboratory ID:	12-209-02					
Dissolved Organic Carbon	**9.0**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**COUMO-20191219**					
Laboratory ID:	12-209-03					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**EVAMS-20191219**					
Laboratory ID:	12-209-04					
Dissolved Organic Carbon	**9.6**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**EVALSS-20191219**					
Laboratory ID:	12-209-05					
Dissolved Organic Carbon	**9.1**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**MONMN-20191219**					
Laboratory ID:	12-209-06					
Dissolved Organic Carbon	**6.5**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**MONMS-20191219**					
Laboratory ID:	12-209-07					
Dissolved Organic Carbon	**7.4**	1.0	SM 5310B	12-26-19	12-26-19	

Date of Report: January 10, 2020
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Laboratory Reference: 1912-209
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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-20191219**					
Laboratory ID:	12-209-08					
Dissolved Organic Carbon	**7.0**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**SEIMN-20191219**					
Laboratory ID:	12-209-09					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**SEIMS-20191219**					
Laboratory ID:	12-209-10					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**TOSMI-20191219**					
Laboratory ID:	12-209-11					
Dissolved Organic Carbon	**6.7**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**TOSMO-20191219**					
Laboratory ID:	12-209-12					
Dissolved Organic Carbon	**6.9**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**TYLMI-20191219**					
Laboratory ID:	12-209-13					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	12-26-19	12-26-19	
Client ID:	**TYLMO-20191219**					
Laboratory ID:	12-209-14					
Dissolved Organic Carbon	**5.2**	1.0	SM 5310B	12-26-19	12-26-19	

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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:	**QA78-20191219**					
Laboratory ID:	12-209-15					
Dissolved Organic Carbon	**6.8**	1.0	SM 5310B	12-26-19	12-26-19	

Date of Report: January 10, 2020
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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:	MB1226D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	12-26-19	12-26-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-209-01								
	ORIG	DUP							
Dissolved Organic Carbon	**15.2**	**14.9**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	12-209-01								
	MS		MS		MS				
Dissolved Organic Carbon	**24.9**		10.0	15.2	97	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1226D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.5**		10.0	NA	105	87-122	NA	NA	

Date of Report: January 10, 2020
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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-20191219**					
Laboratory ID:	12-209-01					
Total Phosphorus	**0.044**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**COUMI-20191219**					
Laboratory ID:	12-209-02					
Total Phosphorus	**0.38**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**COUMO-20191219**					
Laboratory ID:	12-209-03					
Total Phosphorus	**0.19**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**EVAMS-20191219**					
Laboratory ID:	12-209-04					
Total Phosphorus	**0.078**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**EVALSS-20191219**					
Laboratory ID:	12-209-05					
Total Phosphorus	**0.25**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**MONMN-20191219**					
Laboratory ID:	12-209-06					
Total Phosphorus	**0.15**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**MONMS-20191219**					
Laboratory ID:	12-209-07					
Total Phosphorus	**0.090**	0.010	EPA 365.1	12-27-19	12-30-19	

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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-20191219**					
Laboratory ID:	12-209-08					
Total Phosphorus	**0.16**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**SEIMN-20191219**					
Laboratory ID:	12-209-09					
Total Phosphorus	**0.31**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**SEIMS-20191219**					
Laboratory ID:	12-209-10					
Total Phosphorus	**0.19**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**TOSMI-20191219**					
Laboratory ID:	12-209-11					
Total Phosphorus	**0.18**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**TOSMO-20191219**					
Laboratory ID:	12-209-12					
Total Phosphorus	**0.32**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**TYLMI-20191219**					
Laboratory ID:	12-209-13					
Total Phosphorus	**0.21**	0.010	EPA 365.1	12-27-19	12-30-19	
Client ID:	**TYLMO-20191219**					
Laboratory ID:	12-209-14					
Total Phosphorus	**0.13**	0.010	EPA 365.1	12-27-19	12-30-19	

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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:	**QA78-20191219**					
Laboratory ID:	12-209-15					
Total Phosphorus	**0.31**	0.010	EPA 365.1	12-27-19	12-30-19	

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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:	MB1227W2					
Total Phosphorus	**ND**	0.010	EPA 365.1	12-27-19	12-30-19	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	12-209-01								
	ORIG	DUP							
Total Phosphorus	**0.0437**	**0.0447**	NA	NA	NA	NA	2	14	
MATRIX SPIKE									
Laboratory ID:	12-209-01								
	MS		MS		MS				
Total Phosphorus	**0.272**		0.250	0.0437	91	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1227W2								
	SB		SB		SB				
Total Phosphorus	**0.212**		0.250	NA	85	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-20191219**					
Laboratory ID:	12-209-01					
Copper	**1.1**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**5.1**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**COUMI-20191219**					
Laboratory ID:	12-209-02					
Copper	**11**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**120**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**COUMO-20191219**					
Laboratory ID:	12-209-03					
Copper	**7.1**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**72**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**EVAMS-20191219**					
Laboratory ID:	12-209-04					
Copper	**1.9**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**7.0**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**EVALSS-20191219**					
Laboratory ID:	12-209-05					
Copper	**4.9**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**14**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**MONMN-20191219**					
Laboratory ID:	12-209-06					
Copper	**3.4**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**18**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**MONMS-20191219**					
Laboratory ID:	12-209-07					
Copper	**2.6**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**7.8**	5.0	EPA 200.8	12-23-19	12-23-19	

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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-20191219**					
Laboratory ID:	12-209-08					
Copper	**3.5**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**40**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**SEIMN-20191219**					
Laboratory ID:	12-209-09					
Copper	**6.9**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**15**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**SEIMS-20191219**					
Laboratory ID:	12-209-10					
Copper	**2.6**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**7.7**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**TOSMI-20191219**					
Laboratory ID:	12-209-11					
Copper	**9.3**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**330**	25	EPA 200.8	12-23-19	12-24-19	
Client ID:	**TOSMO-20191219**					
Laboratory ID:	12-209-12					
Copper	**12**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**370**	25	EPA 200.8	12-23-19	12-24-19	
Client ID:	**TYLMI-20191219**					
Laboratory ID:	12-209-13					
Copper	**8.7**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**44**	5.0	EPA 200.8	12-23-19	12-23-19	
Client ID:	**TYLMO-20191219**					
Laboratory ID:	12-209-14					
Copper	**6.9**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**35**	5.0	EPA 200.8	12-23-19	12-23-19	

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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:	**QA78-20191219**					
Laboratory ID:	12-209-15					
Copper	**12**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**350**	25	EPA 200.8	12-23-19	12-24-19	

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Samples Submitted: December 19, 2019
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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:	MB1223WH3					
Copper	**ND**	1.0	EPA 200.8	12-23-19	12-23-19	
Zinc	**ND**	5.0	EPA 200.8	12-23-19	12-23-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-209-07										
	ORIG	DUP									
Copper	**2.60**	**2.58**	NA	NA		NA		NA	1	20	
Zinc	**7.84**	**7.26**	NA	NA		NA		NA	8	20	
MATRIX SPIKES											
Laboratory ID:	12-209-07										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**99.2**	**100**	100	100	2.60	**97**	**98**	75-125	1	20	
Zinc	**111**	**113**	100	100	7.84	**103**	**105**	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-20191219**					
Laboratory ID:	12-209-01					
Copper	**ND**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	
Client ID:	**COUMI-20191219**					
Laboratory ID:	12-209-02					
Copper	**2.3**	1.0	EPA 200.8		12-27-19	
Zinc	**22**	5.0	EPA 200.8		12-27-19	
Client ID:	**COUMO-20191219**					
Laboratory ID:	12-209-03					
Copper	**2.0**	1.0	EPA 200.8		12-27-19	
Zinc	**21**	5.0	EPA 200.8		12-27-19	
Client ID:	**EVAMS-20191219**					
Laboratory ID:	12-209-04					
Copper	**ND**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	
Client ID:	**EVALSS-20191219**					
Laboratory ID:	12-209-05					
Copper	**1.1**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	
Client ID:	**MONMN-20191219**					
Laboratory ID:	12-209-06					
Copper	**1.3**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	
Client ID:	**MONMS-20191219**					
Laboratory ID:	12-209-07					
Copper	**1.5**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	

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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:	**MONM-20191219**					
Laboratory ID:	12-209-08					
Copper	**1.5**	1.0	EPA 200.8		12-27-19	
Zinc	**10**	5.0	EPA 200.8		12-27-19	
Client ID:	**SEIMN-20191219**					
Laboratory ID:	12-209-09					
Copper	**1.0**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	
Client ID:	**SEIMS-20191219**					
Laboratory ID:	12-209-10					
Copper	**ND**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	
Client ID:	**TOSMI-20191219**					
Laboratory ID:	12-209-11					
Copper	**2.5**	1.0	EPA 200.8		12-27-19	
Zinc	**130**	5.0	EPA 200.8		12-27-19	
Client ID:	**TOSMO-20191219**					
Laboratory ID:	12-209-12					
Copper	**2.4**	1.0	EPA 200.8		12-27-19	
Zinc	**81**	5.0	EPA 200.8		12-27-19	
Client ID:	**TYLMI-20191219**					
Laboratory ID:	12-209-13					
Copper	**2.3**	1.0	EPA 200.8		12-27-19	
Zinc	**11**	5.0	EPA 200.8		12-27-19	
Client ID:	**TYLMO-20191219**					
Laboratory ID:	12-209-14					
Copper	**2.4**	1.0	EPA 200.8		12-27-19	
Zinc	**8.9**	5.0	EPA 200.8		12-27-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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:	**QA78-20191219**					
Laboratory ID:	12-209-15					
Copper	**2.3**	1.0	EPA 200.8		12-27-19	
Zinc	**83**	5.0	EPA 200.8		12-27-19	

Date of Report: January 10, 2020
Samples Submitted: December 19, 2019
Laboratory Reference: 1912-209
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:	MB1227D2					
Copper	**ND**	1.0	EPA 200.8		12-27-19	
Zinc	**ND**	5.0	EPA 200.8		12-27-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	12-209-15										
	ORIG	DUP									
Copper	**2.26**	**2.30**	NA	NA		NA		NA	2	20	
Zinc	**83.0**	**80.6**	NA	NA		NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	12-209-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**77.0**	**76.8**	80.0	80.0	2.26	**93**	**93**	75-125	0	20	
Zinc	**156**	**157**	80.0	80.0	83.0	**91**	**93**	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 10 2020
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-20191219	Water	19-A020714	Micro, NUT
COUMI-20191219	Water	19-A020715	Micro, NUT
COUMO-20191219	Water	19-A020716	Micro, NUT
EVAMS-20191219	Water	19-A020717	Micro, NUT
EVALSS-20191219	Water	19-A020718	Micro, NUT
MONMN-20191219	Water	19-A020719	Micro, NUT
MONMS-20191219	Water	19-A020720	Micro, NUT
MONM-20191219	Water	19-A020721	Micro, NUT
SEIMN-20191219	Water	19-A020722	Micro, NUT
SEIMS-20191219	Water	19-A020723	Micro, NUT
TOSMI-20191219	Water	19-A020724	Micro, NUT
TOSMO-20191219	Water	19-A020725	Micro, NUT
TYLMI-20191219	Water	19-A020726	Micro, NUT
TYLMO-20191219	Water	19-A020727	Micro, NUT
QA78-20191219	Water	19-A020728	Micro, NUT

Your samples were received on Friday, December 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

Jan 10 2020
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

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
Project #: 14-05806-000
All results reported on an as received basis.

Date Received: 12/20/19
Date Reported: 1/10/20

AMTEST Identification Number **19-A020714**
Client Identification **COLM-20191219**
Sampling Date **12/19/19, 21:40**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	420	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.90	mg/l		0.1			
Total Nitrogen (TKN)	0.718	mg/l		0.2	EPA 351.2	SH	12/26/19
Total Nitrate + Nitrite	0.18	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020715**
Client Identification **COUMI-20191219**
Sampling Date **12/19/19, 19:40**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	220	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.96	mg/l		0.1			
Total Nitrogen (TKN)	0.585	mg/l		0.2	EPA 351.2	SH	12/26/19
Total Nitrate + Nitrite	0.37	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020716**
Client Identification **COUMO-20191219**
Sampling Date **12/19/19, 19:30**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	400	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.47	mg/l		0.1			
Total Nitrogen (TKN)	1.05	mg/l		0.2	EPA 351.2	SH	12/26/19
Total Nitrate + Nitrite	0.42	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020717**
Client Identification **EVAMS-20191219**
Sampling Date **12/19/19, 19:55**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	90.	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	4.91	mg/l		0.1			
Total Nitrogen (TKN)	3.61	mg/l		0.2	EPA 351.2	SH	12/26/19
Total Nitrate + Nitrite	1.3	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020718**
Client Identification **EVALSS-20191219**
Sampling Date **12/19/19, 20:15**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	160	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	3.71	mg/l		0.1			
Total Nitrogen (TKN)	2.61	mg/l		0.2	EPA 351.2	SH	12/26/19
Total Nitrate + Nitrite	1.1	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020719**
Client Identification **MONMN-20191219**
Sampling Date **12/19/19, 20:45**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	140	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.21	mg/l		0.1			
Total Nitrogen (TKN)	1.06	mg/l		0.2	EPA 351.2	SH	12/26/19
Total Nitrate + Nitrite	0.15	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020720**
Client Identification **MONMS-20191219**
Sampling Date **12/19/19, 21:25**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	660	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	0.93	mg/l		0.1			
Total Nitrogen (TKN)	0.697	mg/l		0.2	EPA 351.2	SH	12/26/19
Total Nitrate + Nitrite	0.23	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020721**
Client Identification **MONM-20191219**
Sampling Date **12/19/19, 21:15**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	170	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.53	mg/l		0.1			
Total Nitrogen (TKN)	1.25	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020722**
Client Identification **SEIMN-20191219**
Sampling Date **12/19/19, 20:55**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	33.	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.88	mg/l		0.1			
Total Nitrogen (TKN)	1.67	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.21	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020723**
Client Identification **SEIMS-20191219**
Sampling Date **12/19/19, 21:55**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	180	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	2.29	mg/l		0.1			
Total Nitrogen (TKN)	1.91	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.38	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020724**
Client Identification **TOSMI-20191219**
Sampling Date **12/19/19, 19:15**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	860	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.32	mg/l		0.1			
Total Nitrogen (TKN)	0.975	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.34	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020725**
Client Identification **TOSMO-20191219**
Sampling Date **12/19/19, 20:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	1000	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.16	mg/l		0.1			
Total Nitrogen (TKN)	0.850	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.31	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020726**
Client Identification **TYLMI-20191219**
Sampling Date **12/19/19, 21:00**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	160	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.73	mg/l		0.1			
Total Nitrogen (TKN)	1.45	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	EPA 353.2	SH	12/23/19

AMTEST Identification Number **19-A020727**
Client Identification **TYLMO-20191219**
Sampling Date **12/19/19, 20:30**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	480	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	1.36	mg/l		0.1			
Total Nitrogen (TKN)	1.14	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.22	mg/l		0.02	EPA 353.2	SH	12/23/19

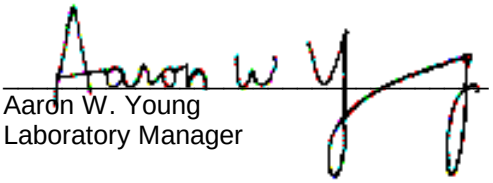
AMTEST Identification Number **19-A020728**
Client Identification **QA78-20191219**
Sampling Date **12/19/19, 20:05**

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE / TIME
Fecal coliform	860	CFU/100 ml		1	SM 9222D	JM	12/20/19 15:30

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Nitrogen (NOX&TKN)	2.10	mg/l		0.1			
Total Nitrogen (TKN)	1.78	mg/l		0.2	EPA 351.2	SH	01/02/20
Total Nitrate + Nitrite	0.32	mg/l		0.02	EPA 353.2	SH	12/23/19



Aaron W. Young
Laboratory Manager

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Kirkland, WA, 98034
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Professional Analytical Services

QC Summary for sample numbers: 19-A020714 to 19-A020728

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
19-A020714	Fecal coliform	CFU/100 ml	420	240	55.
19-A020727	Fecal coliform	CFU/100 ml	480	540	12.
19-A020783	Fecal coliform	CFU/100 ml	390	360	8.0
19-A020785	Fecal coliform	CFU/100 ml	330	340	3.0
19-A020432	Total Nitrogen (TKN)	mg/l	0.635	0.590	7.3
19-A020486	Total Nitrogen (TKN)	mg/l	1.51	1.51	0.00
19-A020609	Total Nitrogen (TKN)	mg/l	0.490	0.466	5.0
19-A020653	Total Nitrogen (TKN)	mg/l	26.5	26.5	0.00
19-A020720	Total Nitrogen (TKN)	mg/l	0.697	0.705	1.1
19-A020753	Total Nitrogen (TKN)	mg/l	0.605	0.588	2.8
19-A020763	Total Nitrogen (TKN)	mg/l	0.827	0.775	6.5
19-A020773	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
19-A020370	Total Nitrate + Nitrite	mg/l	0.80	0.76	5.1
19-A020418	Total Nitrate + Nitrite	mg/l	0.25	0.29	15.
19-A020506	Total Nitrate + Nitrite	mg/l	0.69	0.63	9.1
19-A020550	Total Nitrate + Nitrite	mg/l	0.60	0.70	15.
19-A020551	Total Nitrate + Nitrite	mg/l	0.63	0.72	13.
19-A020727	Total Nitrate + Nitrite	mg/l	0.22	0.22	0.00
19-A020728	Total Nitrate + Nitrite	mg/l	0.32	0.29	9.8

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
19-A020432	Total Nitrogen (TKN)	mg/l	0.635	2.51	2.00	93.75 %
19-A020486	Total Nitrogen (TKN)	mg/l	1.51	3.44	2.00	96.50 %
19-A020609	Total Nitrogen (TKN)	mg/l	0.490	2.41	2.00	96.00 %
Duplicate	Total Nitrogen (TKN)	mg/l	26.5	63.1	40.0	91.50 %
19-A020720	Total Nitrogen (TKN)	mg/l	0.697	2.61	2.00	95.65 %
19-A020753	Total Nitrogen (TKN)	mg/l	0.605	2.54	2.00	96.75 %
19-A020763	Total Nitrogen (TKN)	mg/l	0.827	2.67	2.00	92.15 %
19-A020773	Total Nitrogen (TKN)	mg/l	< 0.2	2.04	2.00	102.00 %
19-A020370	Total Nitrate + Nitrite	mg/l	0.80	1.7	1.0	90.00 %
19-A020418	Total Nitrate + Nitrite	mg/l	0.25	1.2	1.0	95.00 %
19-A020506	Total Nitrate + Nitrite	mg/l	0.69	1.6	1.0	91.00 %
19-A020550	Total Nitrate + Nitrite	mg/l	0.60	1.6	1.0	100.00 %
19-A020551	Total Nitrate + Nitrite	mg/l	0.63	1.7	1.0	107.00 %
19-A020727	Total Nitrate + Nitrite	mg/l	0.22	1.2	1.0	98.00 %
19-A020728	Total Nitrate + Nitrite	mg/l	0.32	1.3	1.0	98.00 %

QC Summary for sample numbers: 19-A020714 to 19-A020728...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.976	97.6 %
Total Nitrogen (TKN)	mg/l	1.00	0.977	97.7 %
Total Nitrogen (TKN)	mg/l	1.00	0.953	95.3 %
Total Nitrogen (TKN)	mg/l	1.00	0.962	96.2 %
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
Total Nitrogen (TKN)	mg/l	< 0.2
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	< 0.02

OnSite Environmental Inc.

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

Laboratory Reference #: 12-209

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-20191219	12/19/19	21:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20191219	12/19/19	19:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20191219	12/19/19	19:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20191219	12/19/19	19:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20191219	12/19/19	20:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20191219	12/19/19	20:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20191219	12/19/19	21:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20191219	12/19/19	21:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20191219	12/19/19	20:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20191219	12/19/19	21:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	12/20/19	10:15	
Received by:	AMTEST T= 4.0	12/20/19	10:15	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

T20

OnSite Environmental Inc.

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

Laboratory Reference #: 12-209

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-20191219 20724	12/19/19	19:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20191219 25	12/19/19	20:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20191219 26	12/19/19	21:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20191219 27	12/19/19	20:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA78-20191219 28	12/19/19	20:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	12/20/19	10:15	
Received by:	AMTEST T= 4.0	12/20/19	10:15	
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

EDDs - CSV

Reporting Limits:

Fecal Coliform - 1.0 cfu/100ml

Total Nitrogen - .10 mg/L

P.21

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

12-209

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.

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 1219	12-19-19	2140	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 1219		1940	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 1219		1930	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 1219		1955	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 1219		2015	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 1219		2045	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 1219		2125	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 1219		2115	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 1219		2055	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 1219		2155	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 1219		1915	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 1219		2000	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 1219		2100	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 1219		2030	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 78-2019 1219		2005	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Kyle Bliss Date 12-19-19 Received by _____ Date 12/19/19

Firm Herrera Time 2055 Firm _____ Time 2055

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

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

12-209

CHAIN OF CUSTODY

Page 1 of 1

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.

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 1219	12-19-19	2140	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2019 1219		1940	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2019 1219		1930	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2019 1219		1955	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2019 1219		2015	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2019 1219		2045	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2019 1219		2125	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2019 1219		215	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2019 1219		2055	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2019 1219		2155	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2019 1219		1915	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2019 1219		2000	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2019 1219		2100	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2019 1219		2030	Water	7	X	X	X	X	X	X	X	X	X			
15	QA TB-2019 1219	↓	2005	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Kyle Bliss Date 12.19.19 Received by [signature] Date 12/19/19

Firm Herrera Time 2055 Firm [illegible] Time 2055

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:	N. Maas
Meter:	DSS #12
Date/Time:	12/19/19 11:45
Barometric Pressure Start of Day:	mmHg: Time:
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.2	0	22.7	-
Conductivity (µS/cm)	1006	1,000	22.6	-
Conductivity (µS/cm)	99.6	100	22.9	-
DO % Saturation	101.0	100	22.9	-

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.8	0	22.0	-
Conductivity (µS/cm)	99.1	100	22.6	-
DO % Saturation	99.7	100	22.1	-

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
Meter:	Pro Plus
Date/Time:	12/19/19 11:30
Barometric Pressure Start of Day:	mmHg: Time:
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.6	0	22.3	
Conductivity (µS/cm)	1000	1,000	22.8	
Conductivity (µS/cm)	99.2	100	22.9	
DO % Saturation	99.0	100	22.5	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.9	0	21.0	
Conductivity (µS/cm)	99.5	100	21.7	
* DO % Saturation	108.3	100	22.1	

DO% in field was consistently >100% (within 110% - 125%)

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: KB, LC

Sample Date: 12.19.19 **Sample Time:** 2055 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 2100

(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, upper 40s

Water Quality Sampling

Sample ID: SEIMN-20191219

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 - had to use 3 filters
Color:	Light Brown
Odor:	None
Sheen:	↓
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

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

Date Checked: 7-17-2020 **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): 0.55

Reference Point (description): Top of Bolt

Water Quality Measurments

Temperature (°C) 6.8

Specific Conductivity (µs/cm) 47.0

Dissolved Oxygen (mg/L) 16.98

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB LC

Sample Date: 12.19.19 **Sample Time:** 2015 PDT:

Base Flow or ~~Storm Event~~? **Field Filtered Time:** 2020 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, 50

Water Quality Sampling

Sample ID: EVALSS-20191219

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: Turbid

Color: Light Brown

Odor: None

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lemtu **Signature:**

Date Checked: 2-12-2020 **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): 2.50

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.9

Specific Conductivity (µs/cm) 137.6

Dissolved Oxygen (mg/L) 13.93

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB LC

Sample Date: 12.19.19 **Sample Time:** 1955 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 2000
(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, 50°F

Water Quality Sampling

Sample ID: EVAMS-20191219

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:	Turbid
Color:	Light Brown
Odor:	None
Sheen:	
Floatables:	Small Foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

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

Date Checked: 2-12-2020 **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): 3.99

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.8

Specific Conductivity (µs/cm) 159.7

Dissolved Oxygen (mg/L) 13.48

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Kyle Bliss, Lisa Colligan

Sample Date: 12.19.19 **Sample Time:** 1915 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1920 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, 50° F

Water Quality Sampling

Sample ID: TOSM1-2019 12.19

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, Light

Odor: None

Sheen: None

Floatables: None

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lantz **Signature:**

Date Checked: 2-12-2020 **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) 8.4

Specific Conductivity (µs/cm) 56.8

Dissolved Oxygen (mg/L) 14.14

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB LC

Sample Date: 12.19.19 **Sample Time:** 2140 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 2145 PST: X

(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: Rainy upper 40s

Water Quality Sampling

Sample ID: COLM-2019 1219

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:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lentz **Signature:**

Date Checked: 2-17-2020 **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): 6.49

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.0

Specific Conductivity (µs/cm) 38

Dissolved Oxygen (mg/L) 14.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB LC

Sample Date: **Sample Time:** 2115 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 2120 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, Upper 40s

Water Quality Sampling

Sample ID: MONM-20191219

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:	↓
Floatables:	

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): N/A

Reference Point (description): N/A

Water Quality Measurments

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 110.6

Dissolved Oxygen (mg/L) 14.3

Quality Assurance

Checked By: S. Leuth **Signature:**

Date Checked: 2-12-2020 **Time:**

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

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass M. O'Connor Lenth

Sample Date: 12-19-19 **Sample Time:** 21:55 PDT: PST:

Base Flow or Storm Event?

Field Filtered Time: 22:00 (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: 50° Raining

Water Quality Sampling

Sample ID: Seims-20191219

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: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

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

Date Checked: 2-12-2020 **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): 0.95

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 7.2

Specific Conductivity (µs/cm) 68.6

Dissolved Oxygen (mg/L) 11.06

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass . M. O'Connor Leath

Sample Date: 12-19-19 **Sample Time:** 19:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 19:35 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUMO [redacted]

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Raining 52°

Water Quality Sampling

Sample ID: COUMO-20191219

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: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Leath **Signature:**

Date Checked: 2-12-2020 **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): 1.6

Reference Point (description): Stb

Water Quality Measurments

Temperature (°C) 8.3

Specific Conductivity (µs/cm) 82.5

Dissolved Oxygen (mg/L) 11.44

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass M. O'Connor Lenth

Sample Date: 12-19-19 **Sample Time:** 19:40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 19:49 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: 52 Raining

Water Quality Sampling

Sample ID: COUMI-20191219

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: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lenth **Signature:**

Date Checked: 2-12-2020 **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): 2.82

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 120.9

Dissolved Oxygen (mg/L) 11.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass M. O'Connor Leuth

Sample Date: 12-19-19 **Sample Time:** 20:00/20:05 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 20:05/2015 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: 52 Raining

Water Quality Sampling

Sample ID: TOSMO-20191219

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: QA78 - 20191219

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: E. Leuth **Signature:**

Date Checked: 2-12-2020 **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): 0.92

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 8.1

Specific Conductivity (µs/cm) 82.5

Dissolved Oxygen (mg/L) 11.63

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass M. O'Connor Leath

Sample Date: 12-11-19 **Sample Time:** 20:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 20:35 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: 48 Raining

Water Quality Sampling

Sample ID: Tylmo-20191219

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: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Leath **Signature:**

Date Checked: 2-12-2020 **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): 2.52

Reference Point (description): Top of culvert

Water Quality Measurments

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 53.6

Dissolved Oxygen (mg/L) 11.55

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass M. O'Connor Leuth

Sample Date: 12-19-19 **Sample Time:** 8 20:45 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 20:50 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: 48 Raining

Water Quality Sampling

Sample ID: Monmn-20191219

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: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Leuth **Signature:**

Date Checked: 7-12-2020 **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): .45

Reference Point (description): Staff gauge

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 91.0

Dissolved Oxygen (mg/L) 11.44

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass M. O'Connor Lenth

Sample Date: 12-19-19 **Sample Time:** 21:00 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 21:05 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: 50. Raining

Water Quality Sampling

Sample ID: Tylmi-20191219

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: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

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

Date Checked: 2-12-2020 **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): 4.1

Reference Point (description): Top of culvert

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 91.4

Dissolved Oxygen (mg/L) 11.34

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass M. O'Connor Lenfer

Sample Date: 12-19-19 **Sample Time:** 21:20 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 21:25 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: 50° Raining

Water Quality Sampling

Sample ID: Monms-20191219

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. Lenfer **Signature:**

Date Checked: 2-12-2020 **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): 6.75

Reference Point (description): PVC pipe

Water Quality Measurments

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 141.5

Dissolved Oxygen (mg/L) 9.78

Data Quality Assurance Worksheet

By J. Brown

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

Date 1/10/20 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: 12/19/19 /All locations, QA78 (TOSMO) Lab Ref No 1912-209

date 2/12/2020

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**	82	**±20**	5	**≤ 25**	4	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	2	**≤ 25**	0	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	7	**≤180**	≤1.0 mg/L 1.0 mg/L	98, 102	**±25**	104	**±15**	2, MS 2	**≤ 20**	2	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	7	**≤28**	≤1.0 mg/L 1.0 mg/L	97	**±25**	105	**±15**	2	**≤ 20**	1	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	11	**≤28**	≤0.01 mg/L 0.01 mg/L	91	**±25**	85	**±20**	D=0.001	**≤ 20**	3	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	7, 14	**≤28**	≤0.1 mg/L 0.1 mg/L	90-107	**±25**	NR	**±20**	0-15 D=0-0.04	**≤ 20**	3, D=0.9	**≤ 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; 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 1/10/20 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: 12/19/19 /All locations, QA78 (TOSMO) Lab Ref No 1912-209

date 2/12/2020

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	97, 98	**±25**	NR	**±15**	D=0.02, MS 1	**≤ 20**	0	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	4-5	**≤180**	≤5.0 µg/L 5.0 µg/L	103, 105	**±25**	NR	**±15**	D=0.58, MS 2	**≤ 20**	6	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤1.0 µg/L 1.0 µg/L	93, 93	**±25**	NR	**±15**	D=0.04, MS 0	**≤ 20**	D=0.1	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤5.0 µg/L 5.0 µg/L	91, 93	**±25**	NR	**±15**	3, MS 1	**≤ 20**	2	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	≤1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	8, 12, 55	**≤ 35**	15	**≤ 50**	OK	FLAG COLM J DUE TO LABORATORY DUPE 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

January 23, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2001-122

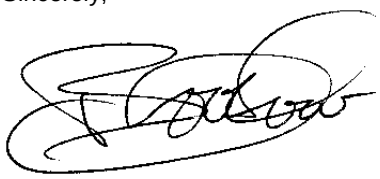
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on January 10, 2020.

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 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
Project: 14-05806-000

Case Narrative

Samples were collected on January 10, 2020 and received by the laboratory on January 10, 2020. 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 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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-20200110**					
Laboratory ID:	01-122-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**COUMI-20200110**					
Laboratory ID:	01-122-02					
Total Suspended Solids	**29**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**COUMO-20200110**					
Laboratory ID:	01-122-03					
Total Suspended Solids	**9.2**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**EVAMS-20200110**					
Laboratory ID:	01-122-04					
Total Suspended Solids	**3.8**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**EVALSS-20200110**					
Laboratory ID:	01-122-05					
Total Suspended Solids	**7.0**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**MONMN-20200110**					
Laboratory ID:	01-122-06					
Total Suspended Solids	**6.4**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**MONMS-20200110**					
Laboratory ID:	01-122-07					
Total Suspended Solids	**2.6**	1.0	SM 2540D	1-15-20	1-16-20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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-20200110**					
Laboratory ID:	01-122-08					
Total Suspended Solids	**8.8**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**SEIMN-20200110**					
Laboratory ID:	01-122-09					
Total Suspended Solids	**7.8**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**SEIMS-20200110**					
Laboratory ID:	01-122-10					
Total Suspended Solids	**9.4**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**TOSMI-20200110**					
Laboratory ID:	01-122-11					
Total Suspended Solids	**23**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**TOSMO-20200110**					
Laboratory ID:	01-122-12					
Total Suspended Solids	**19**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**TYLMI-20200110**					
Laboratory ID:	01-122-13					
Total Suspended Solids	**4.6**	1.0	SM 2540D	1-15-20	1-16-20	
Client ID:	**TYLMO-20200110**					
Laboratory ID:	01-122-14					
Total Suspended Solids	**10**	1.0	SM 2540D	1-15-20	1-16-20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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:	**QA79-20200110**					
Laboratory ID:	01-122-15					
Total Suspended Solids	**7.6**	1.0	SM 2540D	1-15-20	1-16-20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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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:	MB0115W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-15-20	1-16-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-122-09								
	ORIG	DUP							
Total Suspended Solids	**7.80**	**7.20**	NA	NA	NA	NA	8	23	
SPIKE BLANK									
Laboratory ID:	SB0115W1								
	SB		SB		SB				
Total Suspended Solids	**91.0**		100	NA	91	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-20200110**					
Laboratory ID:	01-122-01					
Turbidity	**0.63**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**COUMI-20200110**					
Laboratory ID:	01-122-02					
Turbidity	**20**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**COUMO-20200110**					
Laboratory ID:	01-122-03					
Turbidity	**8.5**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**EVAMS-20200110**					
Laboratory ID:	01-122-04					
Turbidity	**2.6**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**EVALSS-20200110**					
Laboratory ID:	01-122-05					
Turbidity	**3.8**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**MONMN-20200110**					
Laboratory ID:	01-122-06					
Turbidity	**4.3**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**MONMS-20200110**					
Laboratory ID:	01-122-07					
Turbidity	**2.9**	0.10	EPA 180.1	1-10-20	1-10-20	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONM-20200110**					
Laboratory ID:	01-122-08					
Turbidity	**5.8**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**SEIMN-20200110**					
Laboratory ID:	01-122-09					
Turbidity	**4.3**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**SEIMS-20200110**					
Laboratory ID:	01-122-10					
Turbidity	**5.4**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**TOSMI-20200110**					
Laboratory ID:	01-122-11					
Turbidity	**14**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**TOSMO-20200110**					
Laboratory ID:	01-122-12					
Turbidity	**13**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**TYLMI-20200110**					
Laboratory ID:	01-122-13					
Turbidity	**5.0**	0.10	EPA 180.1	1-10-20	1-10-20	
Client ID:	**TYLMO-20200110**					
Laboratory ID:	01-122-14					
Turbidity	**7.7**	0.10	EPA 180.1	1-10-20	1-10-20	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**QA79-20200110**					
Laboratory ID:	01-122-15					
Turbidity	**4.0**	0.10	EPA 180.1	1-10-20	1-10-20	

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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:	MB0110W1					
Turbidity	**ND**	0.10	EPA 180.1	1-10-20	1-10-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-122-02								
	ORIG	DUP							
Turbidity	**20.2**	**19.1**	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-20200110**					
Laboratory ID:	01-122-01					
Hardness	**8.7**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**COUMI-20200110**					
Laboratory ID:	01-122-02					
Hardness	**88**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**COUMO-20200110**					
Laboratory ID:	01-122-03					
Hardness	**56**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**EVAMS-20200110**					
Laboratory ID:	01-122-04					
Hardness	**77**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**EVALSS-20200110**					
Laboratory ID:	01-122-05					
Hardness	**72**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**MONMN-20200110**					
Laboratory ID:	01-122-06					
Hardness	**57**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**MONMS-20200110**					
Laboratory ID:	01-122-07					
Hardness	**74**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	

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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-20200110**					
Laboratory ID:	01-122-08					
Hardness	**61**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**SEIMN-20200110**					
Laboratory ID:	01-122-09					
Hardness	**20**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**SEIMS-20200110**					
Laboratory ID:	01-122-10					
Hardness	**37**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**TOSMI-20200110**					
Laboratory ID:	01-122-11					
Hardness	**50**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**TOSMO-20200110**					
Laboratory ID:	01-122-12					
Hardness	**56**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**TYLMI-20200110**					
Laboratory ID:	01-122-13					
Hardness	**57**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	

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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:	**TYLMO-20200110**					
Laboratory ID:	01-122-14					
Hardness	**37**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	
Client ID:	**QA79-20200110**					
Laboratory ID:	01-122-15					
Hardness	**74**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	

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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:	MB0114WH3					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	1-14-20	1-16-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-122-13										
	ORIG	DUP									
Hardness	**56.9**	**55.9**	NA		NA	NA		NA	2	20	
MATRIX SPIKES											
Laboratory ID:	01-122-13										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**204**	**197**	132	132	56.9	111	106	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB0114WH3										
	SB		SB			SB					
Hardness	**132**		132		NA	100		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-20200110**					
Laboratory ID:	01-122-01					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**COUMI-20200110**					
Laboratory ID:	01-122-02					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**COUMO-20200110**					
Laboratory ID:	01-122-03					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**EVAMS-20200110**					
Laboratory ID:	01-122-04					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**EVALSS-20200110**					
Laboratory ID:	01-122-05					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**MONMN-20200110**					
Laboratory ID:	01-122-06					
Dissolved Organic Carbon	**4.7**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**MONMS-20200110**					
Laboratory ID:	01-122-07					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	1-20-20	1-20-20	

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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-20200110**					
Laboratory ID:	01-122-08					
Dissolved Organic Carbon	**5.0**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**SEIMN-20200110**					
Laboratory ID:	01-122-09					
Dissolved Organic Carbon	**9.4**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**SEIMS-20200110**					
Laboratory ID:	01-122-10					
Dissolved Organic Carbon	**7.5**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**TOSMI-20200110**					
Laboratory ID:	01-122-11					
Dissolved Organic Carbon	**3.7**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**TOSMO-20200110**					
Laboratory ID:	01-122-12					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**TYLMI-20200110**					
Laboratory ID:	01-122-13					
Dissolved Organic Carbon	**8.5**	1.0	SM 5310B	1-20-20	1-20-20	
Client ID:	**TYLMO-20200110**					
Laboratory ID:	01-122-14					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	1-20-20	1-20-20	

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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:	**QA79-20200110**					
Laboratory ID:	01-122-15					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	1-20-20	1-20-20	

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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:	MB0120D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	1-20-20	1-20-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-122-01								
	ORIG	DUP							
Dissolved Organic Carbon	**12.3**	**12.7**	NA	NA	NA	NA	3	15	
MATRIX SPIKE									
Laboratory ID:	01-122-01								
	MS		MS		MS				
Dissolved Organic Carbon	**22.8**		10.0	12.3	105	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0120D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.4**		10.0	NA	104	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-20200110**					
Laboratory ID:	01-122-01					
Total Phosphorus	**0.015**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**COUMI-20200110**					
Laboratory ID:	01-122-02					
Total Phosphorus	**0.10**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**COUMO-20200110**					
Laboratory ID:	01-122-03					
Total Phosphorus	**0.053**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**EVAMS-20200110**					
Laboratory ID:	01-122-04					
Total Phosphorus	**0.024**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**EVALSS-20200110**					
Laboratory ID:	01-122-05					
Total Phosphorus	**0.033**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**MONMN-20200110**					
Laboratory ID:	01-122-06					
Total Phosphorus	**0.032**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**MONMS-20200110**					
Laboratory ID:	01-122-07					
Total Phosphorus	**0.034**	0.010	EPA 365.1	1-16-20	1-17-20	

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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-20200110**					
Laboratory ID:	01-122-08					
Total Phosphorus	**0.042**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**SEIMN-20200110**					
Laboratory ID:	01-122-09					
Total Phosphorus	**0.036**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**SEIMS-20200110**					
Laboratory ID:	01-122-10					
Total Phosphorus	**0.046**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**TOSMI-20200110**					
Laboratory ID:	01-122-11					
Total Phosphorus	**0.057**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**TOSMO-20200110**					
Laboratory ID:	01-122-12					
Total Phosphorus	**0.062**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**TYLMI-20200110**					
Laboratory ID:	01-122-13					
Total Phosphorus	**0.044**	0.010	EPA 365.1	1-16-20	1-17-20	
Client ID:	**TYLMO-20200110**					
Laboratory ID:	01-122-14					
Total Phosphorus	**0.047**	0.010	EPA 365.1	1-16-20	1-17-20	

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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:	**QA79-20200110**					
Laboratory ID:	01-122-15					
Total Phosphorus	**0.034**	0.010	EPA 365.1	1-16-20	1-17-20	

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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:	MB0116W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	1-16-20	1-17-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-122-01								
	ORIG	DUP							
Total Phosphorus	**0.0150**	**0.0130**	NA	NA	NA	NA	14	14	
MATRIX SPIKE									
Laboratory ID:	01-122-01								
	MS		MS		MS				
Total Phosphorus	**0.256**		0.250	0.0150	96	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0116W1								
	SB		SB		SB				
Total Phosphorus	**0.242**		0.250	NA	97	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-20200110**					
Laboratory ID:	01-122-01					
Copper	**ND**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**ND**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**COUMI-20200110**					
Laboratory ID:	01-122-02					
Copper	**2.7**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**24**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**COUMO-20200110**					
Laboratory ID:	01-122-03					
Copper	**2.4**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**31**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**EVAMS-20200110**					
Laboratory ID:	01-122-04					
Copper	**ND**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**5.1**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**EVALSS-20200110**					
Laboratory ID:	01-122-05					
Copper	**ND**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**ND**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**MONMN-20200110**					
Laboratory ID:	01-122-06					
Copper	**1.3**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**6.6**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**MONMS-20200110**					
Laboratory ID:	01-122-07					
Copper	**1.4**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**ND**	5.0	EPA 200.8	1-14-20	1-20-20	

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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-20200110**					
Laboratory ID:	01-122-08					
Copper	**1.5**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**22**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**SEIMN-20200110**					
Laboratory ID:	01-122-09					
Copper	**1.1**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**ND**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**SEIMS-20200110**					
Laboratory ID:	01-122-10					
Copper	**ND**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**ND**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**TOSMI-20200110**					
Laboratory ID:	01-122-11					
Copper	**2.9**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**63**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**TOSMO-20200110**					
Laboratory ID:	01-122-12					
Copper	**2.9**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**39**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**TYLMI-20200110**					
Laboratory ID:	01-122-13					
Copper	**3.0**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**12**	5.0	EPA 200.8	1-14-20	1-20-20	
Client ID:	**TYLMO-20200110**					
Laboratory ID:	01-122-14					
Copper	**3.1**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**20**	5.0	EPA 200.8	1-14-20	1-20-20	

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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:	**QA79-20200110**					
Laboratory ID:	01-122-15					
Copper	**1.4**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**ND**	5.0	EPA 200.8	1-14-20	1-20-20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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:	MB0114WH2					
Copper	**ND**	1.0	EPA 200.8	1-14-20	1-20-20	
Zinc	**ND**	5.0	EPA 200.8	1-14-20	1-20-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-122-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**5.08**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-122-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**84.0**	**79.8**	100	100	ND	**84**	**80**	75-125	5	20	
Zinc	**109**	**106**	100	100	5.08	**104**	**101**	75-125	3	20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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-20200110**					
Laboratory ID:	01-122-01					
Copper	**ND**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	
Client ID:	**COUMI-20200110**					
Laboratory ID:	01-122-02					
Copper	**1.3**	1.0	EPA 200.8		1-20-20	
Zinc	**13**	5.0	EPA 200.8		1-20-20	
Client ID:	**COUMO-20200110**					
Laboratory ID:	01-122-03					
Copper	**1.4**	1.0	EPA 200.8		1-20-20	
Zinc	**21**	5.0	EPA 200.8		1-20-20	
Client ID:	**EVAMS-20200110**					
Laboratory ID:	01-122-04					
Copper	**ND**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	
Client ID:	**EVALSS-20200110**					
Laboratory ID:	01-122-05					
Copper	**ND**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	
Client ID:	**MONMN-20200110**					
Laboratory ID:	01-122-06					
Copper	**1.1**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	
Client ID:	**MONMS-20200110**					
Laboratory ID:	01-122-07					
Copper	**1.2**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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-20200110**					
Laboratory ID:	01-122-08					
Copper	**1.1**	1.0	EPA 200.8		1-20-20	
Zinc	**15**	5.0	EPA 200.8		1-20-20	
Client ID:	**SEIMN-20200110**					
Laboratory ID:	01-122-09					
Copper	**ND**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	
Client ID:	**SEIMS-20200110**					
Laboratory ID:	01-122-10					
Copper	**2.9**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	
Client ID:	**TOSMI-20200110**					
Laboratory ID:	01-122-11					
Copper	**1.8**	1.0	EPA 200.8		1-20-20	
Zinc	**39**	5.0	EPA 200.8		1-20-20	
Client ID:	**TOSMO-20200110**					
Laboratory ID:	01-122-12					
Copper	**1.7**	1.0	EPA 200.8		1-20-20	
Zinc	**21**	5.0	EPA 200.8		1-20-20	
Client ID:	**TYLMI-20200110**					
Laboratory ID:	01-122-13					
Copper	**2.7**	1.0	EPA 200.8		1-20-20	
Zinc	**9.3**	5.0	EPA 200.8		1-20-20	
Client ID:	**TYLMO-20200110**					
Laboratory ID:	01-122-14					
Copper	**3.1**	1.0	EPA 200.8		1-20-20	
Zinc	**10**	5.0	EPA 200.8		1-20-20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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:	**QA79-20200110**					
Laboratory ID:	01-122-15					
Copper	**ND**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	

Date of Report: January 23, 2020
Samples Submitted: January 10, 2020
Laboratory Reference: 2001-122
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:	MB0120D1					
Copper	**ND**	1.0	EPA 200.8		1-20-20	
Zinc	**ND**	5.0	EPA 200.8		1-20-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-122-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-122-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**73.2**	**72.4**	80.0	80.0	ND	**92**	**91**	75-125	1	20	
Zinc	**79.4**	**78.4**	80.0	80.0	ND	**99**	**98**	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 23 2020
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-20200110	Water	20-A000489	Micro, NUT
COUMI-20200110	Water	20-A000490	Micro, NUT
COUMO-20200110	Water	20-A000491	Micro, NUT
EVAMS-20200110	Water	20-A000492	Micro, NUT
EVALSS-20200110	Water	20-A000493	Micro, NUT
MONMN-20200110	Water	20-A000494	Micro, NUT
MONMS-20200110	Water	20-A000495	Micro, NUT
MONM-20200110	Water	20-A000496	Micro, NUT
SEIMN-20200110	Water	20-A000497	Micro, NUT
SEIMS-20200110	Water	20-A000498	Micro, NUT
TOSMI-20200110	Water	20-A000499	Micro, NUT
TOSMO-20200110	Water	20-A000500	Micro, NUT
TYLMI-20200110	Water	20-A000501	Micro, NUT
TYLMO-20200110	Water	20-A000502	Micro, NUT
QA79-20200110	Water	20-A000503	Micro, NUT

Your samples were received on Friday, January 10, 2020. 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 23 2020
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: 01-122

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

Am Test Inc.
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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: 01-122
All results reported on an as received basis.

Date Received: 01/10/20
Date Reported: 1/23/20

AMTEST Identification Number **20-A000489**
Client Identification **COLM-20200110**
Sampling Date **01/10/20, 14:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	16.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.560	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.061	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000490**
Client Identification **COUMI-20200110**
Sampling Date **01/10/20, 12:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	58.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.84	mg/l		0.1			
Total Nitrogen (TKN)	0.477	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000491**
Client Identification **COUMO-20200110**
Sampling Date **01/10/20, 12:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	360	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.75	mg/l		0.1			
Total Nitrogen (TKN)	0.412	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.34	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000492**
Client Identification **EVAMS-20200110**
Sampling Date **01/10/20, 12:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	2.48	mg/l		0.1			
Total Nitrogen (TKN)	0.482	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	2.0	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000493**
Client Identification **EVALSS-20200110**
Sampling Date **01/10/20, 13:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	86.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	2.09	mg/l		0.1			
Total Nitrogen (TKN)	0.491	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	1.6	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000494**
Client Identification **MONMN-20200110**
Sampling Date **01/10/20, 13:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	26.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.58	mg/l		0.1			
Total Nitrogen (TKN)	0.397	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.18	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000495**
Client Identification **MONMS-20200110**
Sampling Date **01/10/20, 14:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	330	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.86	mg/l		0.1			
Total Nitrogen (TKN)	0.495	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.37	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000496**
Client Identification **MONM-20200110**
Sampling Date **01/10/20, 14:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.51	mg/l		0.1			
Total Nitrogen (TKN)	0.224	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000497**
Client Identification **SEIMN-20200110**
Sampling Date **01/10/20, 14:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	8.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.69	mg/l		0.1			
Total Nitrogen (TKN)	0.538	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000498**
Client Identification **SEIMS-20200110**
Sampling Date **01/10/20, 15:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	8.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.60	mg/l		0.1			
Total Nitrogen (TKN)	0.424	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.18	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000499**
Client Identification **TOSMI-20200110**
Sampling Date **01/10/20, 12:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	36.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.62	mg/l		0.1			
Total Nitrogen (TKN)	0.365	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000500**
Client Identification **TOSMO-20200110**
Sampling Date **01/10/20, 12:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	340	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.363	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000501**
Client Identification **TYLMI-20200110**
Sampling Date **01/10/20, 13:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	12.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.85	mg/l		0.1			
Total Nitrogen (TKN)	0.573	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000502**
Client Identification **TYLMO-20200110**
Sampling Date **01/10/20, 13:05**

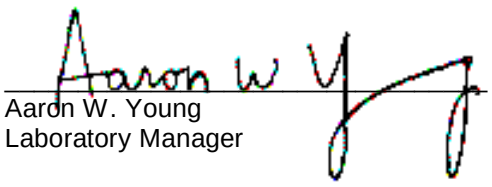
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	220	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	0.65	mg/l		0.1			
Total Nitrogen (TKN)	0.392	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	SH	01/20/20

AMTEST Identification Number **20-A000503**
Client Identification **QA79-20200110**
Sampling Date **01/10/20, 13:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	88.	CFU/100 ml		1	SM 9222D	JM	01/10/20
Total Nitrogen (NOX&TKN)	2.10	mg/l		0.1			
Total Nitrogen (TKN)	0.496	mg/l		0.2	SM4500N	SH	01/16/20
Total Nitrate + Nitrite	1.6	mg/l		0.02	SM4500NO3	SH	01/20/20



Aaron W. Young
Laboratory Manager

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Professional Analytical Services

QC Summary for sample numbers: 20-A000489 to 20-A000503

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A000498	Fecal coliform	CFU/100 ml	8.	26.	110
20-A000503	Fecal coliform	CFU/100 ml	88.	68.	26.
20-A000312	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
20-A000462	Total Nitrogen (TKN)	mg/l	0.737	0.700	5.1
20-A000492	Total Nitrogen (TKN)	mg/l	0.482	0.484	0.41
20-A000502	Total Nitrogen (TKN)	mg/l	0.392	0.384	2.1
20-A000516	Total Nitrogen (TKN)	mg/l	1.43	1.38	3.6
20-A000473	Total Nitrate + Nitrite	mg/l	1.7	1.7	0.00
20-A000483	Total Nitrate + Nitrite	mg/l	1.5	1.5	0.00
20-A000498	Total Nitrate + Nitrite	mg/l	0.18	0.19	5.4
20-A000560	Total Nitrate + Nitrite	mg/l	2.0	1.9	5.1
20-A000572	Total Nitrate + Nitrite	mg/l	0.20	0.20	0.00
20-A000663	Total Nitrate + Nitrite	mg/l	0.68	0.68	0.00
20-A000670	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A000312	Total Nitrogen (TKN)	mg/l	< 0.2	2.22	2.00	111.00 %
20-A000462	Total Nitrogen (TKN)	mg/l	0.737	2.65	2.00	95.65 %
20-A000492	Total Nitrogen (TKN)	mg/l	0.482	2.41	2.00	96.40 %
20-A000502	Total Nitrogen (TKN)	mg/l	0.392	2.23	2.00	91.90 %
20-A000516	Total Nitrogen (TKN)	mg/l	1.43	3.09	2.00	83.00 %
20-A000473	Total Nitrate + Nitrite	mg/l	1.7	2.7	1.0	100.00 %
20-A000483	Total Nitrate + Nitrite	mg/l	1.5	2.4	1.0	90.00 %
20-A000498	Total Nitrate + Nitrite	mg/l	0.18	1.2	1.0	102.00 %
20-A000560	Total Nitrate + Nitrite	mg/l	2.0	3.1	1.0	110.00 %
20-A000572	Total Nitrate + Nitrite	mg/l	0.20	1.2	1.0	100.00 %
20-A000663	Total Nitrate + Nitrite	mg/l	0.68	1.7	1.0	102.00 %
20-A000670	Total Nitrate + Nitrite	mg/l	< 0.02	0.92	1.0	92.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.972	97.2 %
Total Nitrogen (TKN)	mg/l	1.00	0.955	95.5 %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.97	97.0 %

QC Summary for sample numbers: 20-A000489 to 20-A000503...

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

OnSite Environmental Inc.

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

Laboratory Reference #: 01-122

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-20200110 489	1/10/20	14:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200110 90	1/10/20	12:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200110 91	1/10/20	12:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200110 92	1/10/20	12:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200110 93	1/10/20	13:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200110 94	1/10/20	13:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200110 95	1/10/20	14:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200110 96	1/10/20	14:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200110 97	1/10/20	14:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200110 98	1/10/20	15:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	1/10/20	1635	
Received by:	Amtest	1/10/20	1635	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

T=3.5

OnSite Environmental Inc.

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

Laboratory Reference #: 01-122

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-20200110 499	1/10/20	12:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200110 500	1/10/20	12:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200110 01	1/10/20	13:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200110 02	1/10/20	13:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA79-20200110 03	1/10/20	13:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:		OnSite Env	1/10/20	1635	
Received by:		Amtest	1/10/20	1635	
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

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. 01-122

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-20200110	1/10/20	1445	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-20200110		1225	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-20200110		1205	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-20200110		1255	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-20200110		1320	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-20200110		1345	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-20200110		1405	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-20200110		1425	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-20200110		1405	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-20200110		1535	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-20200110		1215	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-20200110		1240	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-20200110		1320	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-20200110		1305	Water	7	X	X	X	X	X	X	X	X	X			
15	QA79-20200110		1330	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by LISA COLLIGAN Date 0110 2020 Received by [signature] Date 1/10/20

Firm HERRERA ENVIRONMENTAL CONSULTANTS Time 16:02 Firm ODE Time 1607

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. 01-122

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-20200110	1/10/20	1445	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-20200110		1225	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-20200110		1205	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-20200110		1255	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-20200110		1320	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-20200110		1345	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-20200110		1405	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-20200110		1425	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-20200110		1405	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-20200110		1535	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-20200110		1215	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-20200110		1240	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-20200110		1320	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-20200110		1305	Water	7	X	X	X	X	X	X	X	X	X			
	QA79-20200110		1330	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by LISA COLLIGAN Date 0110 2020 Received by _____ Date 1/10/20

Firm HERRERA ENVIRONMENTAL CONSULTANTS Time 16:07 Firm ODE Time 1607

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:	KB/NM
Meter:	PRO Plus
Date/Time:	7/10/20
Barometric Pressure Start of Day:	mmHg: 754.3 Time: 9:45
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.7	0	20.2	used Distilled H2O (DI needs service)
Conductivity (µS/cm)	994	1,000	21.2	after 2 1000
Conductivity (µS/cm)	99.8	100	21.5	
DO % Saturation	99.8	100	20.9	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.2	0	20.1	
Conductivity (µS/cm)	99.4	100	20.1	
DO % Saturation	99.7	100	19.9	

DI reading ~6-7 SPC

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:	KB / NM
Meter:	DSS #2
Date/Time:	1/10/20
Barometric Pressure Start of Day:	mmHg: 760.2 Time: 9:45
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.1	0	19.6	used distilled H2O
Conductivity (µS/cm)	100	1,000	20.8	after = 1000
Conductivity (µS/cm)	99.6	100	20.9	
DO % Saturation	99.0	100	20.4	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.3	0	19.4	
Conductivity (µS/cm)	99.5	100	19.5	
DO % Saturation	99.5	100	19.1	

DI Readings high (3 - 5 spc)

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: K.B., L.C.

Sample Date: 01/10/2020 **Sample Time:** 1445 PDT: PST: ✓

Base Flow or ~~Storm Event~~? **Field Filtered Time:** 1455

(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: Clear, partly sunny, 43°

Water Quality Sampling

Sample ID: COLM-20200110

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:	Slightly red, brown
Odor:	None ↓
Sheen:	
Floatables:	Some foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Conti **Signature:**

Date Checked: 2-12-2020 **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): 5.86

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.4

Specific Conductivity (µs/cm) 29.2

Dissolved Oxygen (mg/L) 13.29

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/10/20 **Sample Time:** 1225 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1230 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: 45°, rainy

Water Quality Sampling

Sample ID: COUMI-20200110

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Leutl **Signature:**

Date Checked: 2-12-2020 **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): 2.65

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.1

Specific Conductivity (µs/cm) 184.6

Dissolved Oxygen (mg/L) 12.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/10/20 **Sample Time:** 1205 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 120 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: 45°, rainy

Water Quality Sampling

Sample ID: COUMO-20200110

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Lamb **Signature:**

Date Checked: 2-12-2020 **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): 1.47

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 136

Dissolved Oxygen (mg/L) 12.01

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: K. Bliss, L. Colligan

Sample Date: 01/10/2020 **Sample Time:** 1255 PDT: PST: ✓

Base Flow or Storm Event? **Field Filtered Time:** 1300

(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, 40°F

Water Quality Sampling

Sample ID: EVAMS-20200110

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:	Slightly brown
Odor:	No
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Corvallis **Signature:**

Date Checked: 2-12-2020 **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) 6.2

Specific Conductivity (µs/cm) 179.8

Dissolved Oxygen (mg/L) 13.04

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: K. B., L. C.

Sample Date: 01/10/2020 **Sample Time:** 1320

Base Flow or Storm Event? **Field Filtered Time:** 1325
(Must filter within 15 minutes of collection)

QA79 1330 1335

PDT:

PST: ✓

SITE ID: EVALSS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAINY, 40°C

Water Quality Sampling

Sample ID: EVALSS-20200110

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:	QA79 20200110
Filter blank sample ID:	
Transfer blank sample ID:	

Visual and Olfactory Conditions:

Clarity:	Clear
Color:	Slightly turbid
Odor:	None
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Cenedella **Signature:**

Date Checked: 2-12-2020 **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): 2.31

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.1

Specific Conductivity (µs/cm) 166.1

Dissolved Oxygen (mg/L) 13.36

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/10/20 **Sample Time:** 1345 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1350 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: 45°, cloudy

Water Quality Sampling

Sample ID: MONMN-20200110

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:

Sheen:

Floatables: some bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lentz **Signature:**

Date Checked: 2-12-2020 **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): 9.70

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.4

Specific Conductivity (µs/cm) 140.8

Dissolved Oxygen (mg/L) 12.09

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/10/20 **Sample Time:** 1405 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1410 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: 45°, cloudy

Water Quality Sampling

Sample ID: MONMS-20200110

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Coutts **Signature:**

Date Checked: 2-12-2020 **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): 6.68

Reference Point (description): top of PVC

Water Quality Measurments

Temperature (°C) 5.7

Specific Conductivity (µs/cm) 194.9

Dissolved Oxygen (mg/L) 0.65

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/10/20 **Sample Time:** 1425 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1430 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: 45° cloudy

Water Quality Sampling

Sample ID: MONM-20200110

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: J. Lentz **Signature:**

Date Checked: 2-12-2020 **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) 5.9

Specific Conductivity (µs/cm) 157.6

Dissolved Oxygen (mg/L) 12.37

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: K.B., L.C.

Sample Date: 01/10/2020 **Sample Time:** 1405 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1415 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, 46°F

Water Quality Sampling

Sample ID: SEIMN-20200110

Parameter	Bottle Type	Bottle Volume	# Bottles	Preservative	Duplicated?
TSS and Turbidity	HDPE	1L	1	NA	NU
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:	None
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lentz **Signature:**

Date Checked: 2-12-2020 **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): TAPE MEASURE

Water Quality Measurments

Temperature (°C) 5.6

Specific Conductivity (µs/cm) 51.4

Dissolved Oxygen (mg/L) 13.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: K.B., L.C.

Sample Date: 01/10/2020 **Sample Time:** 1535 PDT: PST: ✓

Base Flow or Storm Event? **Field Filtered Time:** 1540

(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: Clear, Partly Cloudy, 43° F

Water Quality Sampling

Sample ID: SEIMS-20200110

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:	Slightly yellow/brown
Odor:	No
Sheen:	↓
Floatables:	Slight foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lentz **Signature:**

Date Checked: 2-12-2020 **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): — DIDN'T GET

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.0

Specific Conductivity (µs/cm) 86.9

Dissolved Oxygen (mg/L) 12.23

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB, LC

Sample Date: 01/10/2020 **Sample Time:** 1215 PDT: PST: ✓

Base Flow or Storm Event? **Field Filtered Time:** 1220 (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, 40°F

Water Quality Sampling

Sample ID: TOSM1-20200110

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, yellow
Color:	Light yellow brown
Odor:	NO
Sheen:	NO
Floatables:	NO

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T. Lowry **Signature:**

Date Checked: 2-12-2020 **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): 0.91

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.5

Specific Conductivity (µs/cm) 98.3

Dissolved Oxygen (mg/L) 12.45

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/10/20 **Sample Time:** 1240 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1245 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: 45°, rainy

Water Quality Sampling

Sample ID: TOSMO-20200110

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:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: S. Lenth **Signature:**

Date Checked: 2.12.2020 **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) 5.9

Specific Conductivity (µs/cm) 131.6

Dissolved Oxygen (mg/L) 12.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 1/10/20 **Sample Time:** 1320 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1325 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: 45, rainy

Water Quality Sampling

Sample ID: TYLMI-20200110

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:

Sheen:

Floatables:

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): 4ft 4.25 in

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 5.8

Specific Conductivity (µs/cm) 126.7

Dissolved Oxygen (mg/L) 11.90

Quality Assurance

Checked By: J. Lentz **Signature:**

Date Checked: 2-12-2020 **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: 1/10/20 **Sample Time:** 1305 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1310 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: 45, rainy

Water Quality Sampling

Sample ID: TYLMO-20200110

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: T Leuth **Signature:**

Date Checked: 2-12-2020 **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): 2ft 9in

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 5.8

Specific Conductivity (µs/cm) 88.8

Dissolved Oxygen (mg/L) 12.19

Data Quality Assurance Worksheet

By J. Brown

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

Date 1/24/20 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: 1/10/2020 /All locations, QA79 (EVALSS) Lab Ref No 2001-122

date 2/12/2020

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**	91	**±20**	8	**≤ 25**	8	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	6	**≤ 25**	5	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	6	**≤180**	≤1.0 mg/L 1.0 mg/L	111, 106	**±25**	100	**±15**	2, MS 3	**≤ 20**	3	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	10	**≤28**	≤1.0 mg/L 1.0 mg/L	105	**±25**	104	**±15**	3	**≤ 20**	0	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	96	**±25**	97	**±20**	D=0.002	**≤ 20**	D=0.001	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	6, 10	**≤28**	≤0.1 mg/L 0.1 mg/L	83-111	**±25**	96-99	**±20**	NC, 0-5 D=0.002-0.04	**≤ 20**	0, 0.5	**≤ 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; 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 1/24/20 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: 1/10/2020 /All locations, QA79 (EVALSS) Lab Ref No 2001-122

date 2/12/2020

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	84, 80	**±25**	NR	**±15**	NC, MS 5	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	10	**≤180**	≤5.0 µg/L 5.0 µg/L	104, 101	**±25**	NR	**±15**	NC MS 3	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	10	**≤180**	≤1.0 µg/L 1.0 µg/L	92, 91	**±25**	NR	**±15**	NC, MS 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	10	**≤180**	≤5.0 µg/L 5.0 µg/L	99, 98	**±25**	NR	**±15**	NC, MS 1	**≤ 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**	106, 26	**≤ 35**	2	**≤ 50**	OK	FLAG SEIMS J DUE TO LAB DUPE 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

February 3, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2001-251

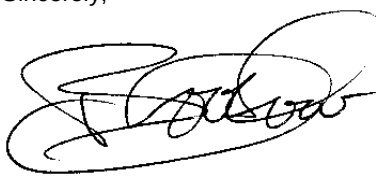
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on January 23, 2020.

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 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
Project: 14-05806-000

Case Narrative

Samples were collected on January 23, 2020 and received by the laboratory on January 23, 2020. 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 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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-20200123**					
Laboratory ID:	01-251-01					
Total Suspended Solids	**2.0**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**COUMI-20200123**					
Laboratory ID:	01-251-02					
Total Suspended Solids	**29**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**COUMO-20200123**					
Laboratory ID:	01-251-03					
Total Suspended Solids	**16**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**EVAMS-20200123**					
Laboratory ID:	01-251-04					
Total Suspended Solids	**10**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**EVALSS-20200123**					
Laboratory ID:	01-251-05					
Total Suspended Solids	**59**	2.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**MONMN-20200123**					
Laboratory ID:	01-251-06					
Total Suspended Solids	**6.4**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**MONMS-20200123**					
Laboratory ID:	01-251-07					
Total Suspended Solids	**4.4**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**MONM-20200123**					
Laboratory ID:	01-251-08					
Total Suspended Solids	**8.0**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**SEIMN-20200123**					
Laboratory ID:	01-251-09					
Total Suspended Solids	**48**	1.0	SM 2540D	1-24-20	1-27-20	

Date of Report: February 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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:	**SEIMS-20200123**					
Laboratory ID:	01-251-10					
Total Suspended Solids	**14**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**TOSMI-20200123**					
Laboratory ID:	01-251-11					
Total Suspended Solids	**50**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**TOSMO-20200123**					
Laboratory ID:	01-251-12					
Total Suspended Solids	**45**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**TYLMI-20200123**					
Laboratory ID:	01-251-13					
Total Suspended Solids	**9.2**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**TYLMO-20200123**					
Laboratory ID:	01-251-14					
Total Suspended Solids	**12**	1.0	SM 2540D	1-24-20	1-27-20	
Client ID:	**QA80-20200123**					
Laboratory ID:	01-251-15					
Total Suspended Solids	**8.2**	1.0	SM 2540D	1-24-20	1-27-20	

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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0124W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	1-24-20	1-27-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-251-01								
	ORIG	DUP							
Total Suspended Solids	**2.00**	**2.00**	NA	NA	NA	NA	0	23	
SPIKE BLANK									
Laboratory ID:	SB0124W2								
	SB		SB		SB				
Total Suspended Solids	**82.0**		100	NA	82	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-20200123**					
Laboratory ID:	01-251-01					
Turbidity	**1.3**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**COUMI-20200123**					
Laboratory ID:	01-251-02					
Turbidity	**18**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**COUMO-20200123**					
Laboratory ID:	01-251-03					
Turbidity	**11**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**EVAMS-20200123**					
Laboratory ID:	01-251-04					
Turbidity	**7.7**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**EVALSS-20200123**					
Laboratory ID:	01-251-05					
Turbidity	**29**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**MONMN-20200123**					
Laboratory ID:	01-251-06					
Turbidity	**5.7**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**MONMS-20200123**					
Laboratory ID:	01-251-07					
Turbidity	**17**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**MONM-20200123**					
Laboratory ID:	01-251-08					
Turbidity	**7.4**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**SEIMN-20200123**					
Laboratory ID:	01-251-09					
Turbidity	**19**	0.10	EPA 180.1	1-24-20	1-24-20	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200123**					
Laboratory ID:	01-251-10					
Turbidity	**5.9**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**TOSMI-20200123**					
Laboratory ID:	01-251-11					
Turbidity	**27**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**TOSMO-20200123**					
Laboratory ID:	01-251-12					
Turbidity	**26**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**TYLMI-20200123**					
Laboratory ID:	01-251-13					
Turbidity	**8.8**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**TYLMO-20200123**					
Laboratory ID:	01-251-14					
Turbidity	**9.2**	0.10	EPA 180.1	1-24-20	1-24-20	
Client ID:	**QA80-20200123**					
Laboratory ID:	01-251-15					
Turbidity	**8.9**	0.10	EPA 180.1	1-24-20	1-24-20	

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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:	MB0124W1					
Turbidity	**ND**	0.10	EPA 180.1	1-24-20	1-24-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-251-02								
	ORIG	DUP							
Turbidity	**18.4**	**17.9**	NA	NA	NA	NA	3	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-20200123**					
Laboratory ID:	01-251-01					
Hardness	**7.7**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**COUMI-20200123**					
Laboratory ID:	01-251-02					
Hardness	**75**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**COUMO-20200123**					
Laboratory ID:	01-251-03					
Hardness	**50**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**EVAMS-20200123**					
Laboratory ID:	01-251-04					
Hardness	**65**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**EVALSS-20200123**					
Laboratory ID:	01-251-05					
Hardness	**65**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**MONMN-20200123**					
Laboratory ID:	01-251-06					
Hardness	**45**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**MONMS-20200123**					
Laboratory ID:	01-251-07					
Hardness	**72**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	

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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-20200123**					
Laboratory ID:	01-251-08					
Hardness	**51**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**SEIMN-20200123**					
Laboratory ID:	01-251-09					
Hardness	**17**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**SEIMS-20200123**					
Laboratory ID:	01-251-10					
Hardness	**29**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**TOSMI-20200123**					
Laboratory ID:	01-251-11					
Hardness	**35**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**TOSMO-20200123**					
Laboratory ID:	01-251-12					
Hardness	**48**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**TYLMI-20200123**					
Laboratory ID:	01-251-13					
Hardness	**41**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	
Client ID:	**TYLMO-20200123**					
Laboratory ID:	01-251-14					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	

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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:	**QA80-20200123**					
Laboratory ID:	01-251-15					
Hardness	**39**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	

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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:	MB0128WH3					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	1-28-20	1-28-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-251-01										
	ORIG	DUP									
Hardness	**7.65**	**7.54**	NA		NA	NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	01-251-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**147**	**143**	132	132	7.65	106	103	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB0128WH3										
	SB		SB			SB					
Hardness	**131**		132		NA	99		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-20200123**					
Laboratory ID:	01-251-01					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**COUMI-20200123**					
Laboratory ID:	01-251-02					
Dissolved Organic Carbon	**7.1**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**COUMO-20200123**					
Laboratory ID:	01-251-03					
Dissolved Organic Carbon	**5.9**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**EVAMS-20200123**					
Laboratory ID:	01-251-04					
Dissolved Organic Carbon	**9.2**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**EVALSS-20200123**					
Laboratory ID:	01-251-05					
Dissolved Organic Carbon	**9.2**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**MONMN-20200123**					
Laboratory ID:	01-251-06					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**MONMS-20200123**					
Laboratory ID:	01-251-07					
Dissolved Organic Carbon	**8.7**	1.0	SM 5310B	1-27-20	1-27-20	

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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-20200123**					
Laboratory ID:	01-251-08					
Dissolved Organic Carbon	**5.2**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**SEIMN-20200123**					
Laboratory ID:	01-251-09					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**SEIMS-20200123**					
Laboratory ID:	01-251-10					
Dissolved Organic Carbon	**8.6**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**TOSMI-20200123**					
Laboratory ID:	01-251-11					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**TOSMO-20200123**					
Laboratory ID:	01-251-12					
Dissolved Organic Carbon	**6.5**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**TYLMI-20200123**					
Laboratory ID:	01-251-13					
Dissolved Organic Carbon	**7.6**	1.0	SM 5310B	1-27-20	1-27-20	
Client ID:	**TYLMO-20200123**					
Laboratory ID:	01-251-14					
Dissolved Organic Carbon	**6.3**	1.0	SM 5310B	1-27-20	1-27-20	

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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:	**QA80-20200123**					
Laboratory ID:	01-251-15					
Dissolved Organic Carbon	**7.8**	1.0	SM 5310B	1-27-20	1-27-20	

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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:	MB0127D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	1-27-20	1-27-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-251-01								
	ORIG	DUP							
Dissolved Organic Carbon	**10.6**	**10.7**	NA	NA	NA	NA	1	15	
MATRIX SPIKE									
Laboratory ID:	01-251-01								
	MS		MS		MS				
Dissolved Organic Carbon	**20.6**		10.0	10.6	100	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0127D1								
	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-20200123**					
Laboratory ID:	01-251-01					
Total Phosphorus	**0.017**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**COUMI-20200123**					
Laboratory ID:	01-251-02					
Total Phosphorus	**0.092**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**COUMO-20200123**					
Laboratory ID:	01-251-03					
Total Phosphorus	**0.070**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**EVAMS-20200123**					
Laboratory ID:	01-251-04					
Total Phosphorus	**0.044**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**EVALSS-20200123**					
Laboratory ID:	01-251-05					
Total Phosphorus	**0.11**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**MONMN-20200123**					
Laboratory ID:	01-251-06					
Total Phosphorus	**0.041**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**MONMS-20200123**					
Laboratory ID:	01-251-07					
Total Phosphorus	**0.065**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**MONM-20200123**					
Laboratory ID:	01-251-08					
Total Phosphorus	**0.046**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**SEIMN-20200123**					
Laboratory ID:	01-251-09					
Total Phosphorus	**0.072**	0.010	EPA 365.1	1-29-20	1-30-20	

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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:	**SEIMS-20200123**					
Laboratory ID:	01-251-10					
Total Phosphorus	**0.051**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**TOSMI-20200123**					
Laboratory ID:	01-251-11					
Total Phosphorus	**0.12**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**TOSMO-20200123**					
Laboratory ID:	01-251-12					
Total Phosphorus	**0.11**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**TYLMI-20200123**					
Laboratory ID:	01-251-13					
Total Phosphorus	**0.053**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**TYLMO-20200123**					
Laboratory ID:	01-251-14					
Total Phosphorus	**0.053**	0.010	EPA 365.1	1-29-20	1-30-20	
Client ID:	**QA80-20200123**					
Laboratory ID:	01-251-15					
Total Phosphorus	**0.054**	0.010	EPA 365.1	1-29-20	1-30-20	

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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:	MB0129W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	1-29-20	1-30-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	01-251-01								
	ORIG	DUP							
Total Phosphorus	**0.0171**	**0.0143**	NA	NA	NA	NA	18	14	C
MATRIX SPIKE									
Laboratory ID:	01-251-01								
	MS		MS		MS				
Total Phosphorus	**0.256**		0.250	0.0171	96	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0129W1								
	SB		SB		SB				
Total Phosphorus	**0.255**		0.250	NA	102	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-20200123**					
Laboratory ID:	01-251-01					
Copper	**ND**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**ND**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**COUMI-20200123**					
Laboratory ID:	01-251-02					
Copper	**3.3**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**23**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**COUMO-20200123**					
Laboratory ID:	01-251-03					
Copper	**3.0**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**28**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**EVAMS-20200123**					
Laboratory ID:	01-251-04					
Copper	**1.2**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**6.5**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**EVALSS-20200123**					
Laboratory ID:	01-251-05					
Copper	**2.7**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**10**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**MONMN-20200123**					
Laboratory ID:	01-251-06					
Copper	**1.8**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**5.3**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**MONMS-20200123**					
Laboratory ID:	01-251-07					
Copper	**2.3**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**5.9**	5.0	EPA 200.8	1-28-20	1-31-20	

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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-20200123**					
Laboratory ID:	01-251-08					
Copper	**1.8**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**10**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**SEIMN-20200123**					
Laboratory ID:	01-251-09					
Copper	**1.9**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**ND**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**SEIMS-20200123**					
Laboratory ID:	01-251-10					
Copper	**ND**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**ND**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**TOSMI-20200123**					
Laboratory ID:	01-251-11					
Copper	**9.0**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**57**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**TOSMO-20200123**					
Laboratory ID:	01-251-12					
Copper	**9.4**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**45**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**TYLMI-20200123**					
Laboratory ID:	01-251-13					
Copper	**2.7**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**10**	5.0	EPA 200.8	1-28-20	1-31-20	
Client ID:	**TYLMO-20200123**					
Laboratory ID:	01-251-14					
Copper	**3.4**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**17**	5.0	EPA 200.8	1-28-20	1-31-20	

Date of Report: February 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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:	**QA80-20200123**					
Laboratory ID:	01-251-15					
Copper	**2.8**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**11**	5.0	EPA 200.8	1-28-20	1-31-20	

Date of Report: February 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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:	MB01289WH2					
Copper	**ND**	1.0	EPA 200.8	1-28-20	1-31-20	
Zinc	**ND**	5.0	EPA 200.8	1-28-20	1-31-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-251-04										
	ORIG	DUP									
Copper	**1.20**	**1.25**	NA	NA		NA		NA	4	20	
Zinc	**6.50**	**6.94**	NA	NA		NA		NA	7	20	
MATRIX SPIKES											
Laboratory ID:	01-251-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**88.6**	**90.8**	100	100	1.20	**87**	**90**	75-125	2	20	
Zinc	**104**	**104**	100	100	6.50	**98**	**98**	75-125	0	20	

Date of Report: February 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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-20200123**					
Laboratory ID:	01-251-01					
Copper	**ND**	1.0	EPA 200.8		1-31-20	
Zinc	**ND**	5.0	EPA 200.8		1-31-20	
Client ID:	**COUMI-20200123**					
Laboratory ID:	01-251-02					
Copper	**1.9**	1.0	EPA 200.8		1-31-20	
Zinc	**13**	5.0	EPA 200.8		1-31-20	
Client ID:	**COUMO-20200123**					
Laboratory ID:	01-251-03					
Copper	**2.1**	1.0	EPA 200.8		1-31-20	
Zinc	**21**	5.0	EPA 200.8		1-31-20	
Client ID:	**EVAMS-20200123**					
Laboratory ID:	01-251-04					
Copper	**ND**	1.0	EPA 200.8		1-31-20	
Zinc	**6.2**	5.0	EPA 200.8		1-31-20	
Client ID:	**EVALSS-20200123**					
Laboratory ID:	01-251-05					
Copper	**1.1**	1.0	EPA 200.8		1-31-20	
Zinc	**ND**	5.0	EPA 200.8		1-31-20	
Client ID:	**MONMN-20200123**					
Laboratory ID:	01-251-06					
Copper	**1.5**	1.0	EPA 200.8		1-31-20	
Zinc	**ND**	5.0	EPA 200.8		1-31-20	
Client ID:	**MONMS-20200123**					
Laboratory ID:	01-251-07					
Copper	**1.7**	1.0	EPA 200.8		1-31-20	
Zinc	**5.2**	5.0	EPA 200.8		1-31-20	

Date of Report: February 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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-20200123**					
Laboratory ID:	01-251-08					
Copper	**1.5**	1.0	EPA 200.8		1-31-20	
Zinc	**8.3**	5.0	EPA 200.8		1-31-20	
Client ID:	**SEIMN-20200123**					
Laboratory ID:	01-251-09					
Copper	**ND**	1.0	EPA 200.8		1-31-20	
Zinc	**ND**	5.0	EPA 200.8		1-31-20	
Client ID:	**SEIMS-20200123**					
Laboratory ID:	01-251-10					
Copper	**ND**	1.0	EPA 200.8		1-31-20	
Zinc	**ND**	5.0	EPA 200.8		1-31-20	
Client ID:	**TOSMI-20200123**					
Laboratory ID:	01-251-11					
Copper	**5.9**	1.0	EPA 200.8		1-31-20	
Zinc	**31**	5.0	EPA 200.8		1-31-20	
Client ID:	**TOSMO-20200123**					
Laboratory ID:	01-251-12					
Copper	**7.0**	1.0	EPA 200.8		1-31-20	
Zinc	**22**	5.0	EPA 200.8		1-31-20	
Client ID:	**TYLMI-20200123**					
Laboratory ID:	01-251-13					
Copper	**2.6**	1.0	EPA 200.8		1-31-20	
Zinc	**9.9**	5.0	EPA 200.8		1-31-20	
Client ID:	**TYLMO-20200123**					
Laboratory ID:	01-251-14					
Copper	**2.7**	1.0	EPA 200.8		1-31-20	
Zinc	**13**	5.0	EPA 200.8		1-31-20	

Date of Report: February 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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:	**QA80-20200123**					
Laboratory ID:	01-251-15					
Copper	**2.5**	1.0	EPA 200.8		1-31-20	
Zinc	**9.3**	5.0	EPA 200.8		1-31-20	

Date of Report: February 3, 2020
Samples Submitted: January 23, 2020
Laboratory Reference: 2001-251
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:	MB0131D1					
Copper	**ND**	1.0	EPA 200.8		1-31-20	
Zinc	**ND**	5.0	EPA 200.8		1-31-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-251-15										
	ORIG	DUP									
Copper	**2.52**	**2.42**	NA	NA		NA		NA	4	20	
Zinc	**9.30**	**9.02**	NA	NA		NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	01-251-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**86.0**	**87.6**	80.0	80.0	2.52	**104**	**106**	75-125	2	20	
Zinc	**95.8**	**99.0**	80.0	80.0	9.30	**108**	**112**	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 31 2020
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-20200123	Water	20-A000989	Micro, NUT
COUMI-20200123	Water	20-A000990	Micro, NUT
COUMO-20200123	Water	20-A000991	Micro, NUT
EVAMS-20200123	Water	20-A000992	Micro, NUT
EVALSS-20200123	Water	20-A000993	Micro, NUT
MONMN-20200123	Water	20-A000994	Micro, NUT
MONMS-20200123	Water	20-A000995	Micro, NUT
MONM-20200123	Water	20-A000996	Micro, NUT
SEIMN-20200123	Water	20-A000997	Micro, NUT
SEIMS-20200123	Water	20-A000998	Micro, NUT
TOSMI-20200123	Water	20-A000999	Micro, NUT
TOSMO-20200123	Water	20-A001000	Micro, NUT
TYLMI-20200123	Water	20-A001001	Micro, NUT
TYLMO-20200123	Water	20-A001002	Micro, NUT
QA80-20200123	Water	20-A001003	Micro, NUT

Your samples were received on Friday, January 24, 2020. 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 31 2020
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: 01-251

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: 01-251
All results reported on an as received basis.

Date Received: 01/24/20
Date Reported: 1/31/20

AMTEST Identification Number **20-A000989**
Client Identification **COLM-20200123**
Sampling Date **01/23/20, 17:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	15.	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.594	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.087	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000990**
Client Identification **COUMI-20200123**
Sampling Date **01/23/20, 15:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	1.15	mg/l		0.1			
Total Nitrogen (TKN)	0.737	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.41	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000991**
Client Identification **COUMO-20200123**
Sampling Date **01/23/20, 15:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	130	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	1.03	mg/l		0.1			
Total Nitrogen (TKN)	0.626	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.40	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000992**
Client Identification **EVAMS-20200123**
Sampling Date **01/23/20, 16:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	31.	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	2.04	mg/l		0.1			
Total Nitrogen (TKN)	0.843	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	1.2	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000993**
Client Identification **EVALSS-20200123**
Sampling Date **01/23/20, 16:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	300	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	2.36	mg/l		0.1			
Total Nitrogen (TKN)	1.38	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.98	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000994**
Client Identification **MONMN-20200123**
Sampling Date **01/23/20, 17:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	68.	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.488	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.31	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000995**
Client Identification **MONMS-20200123**
Sampling Date **01/23/20, 17:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1900	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	1.12	mg/l		0.1			
Total Nitrogen (TKN)	0.677	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.44	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000996**
Client Identification **MONM-20200123**
Sampling Date **01/23/20, 18:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	740	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	0.90	mg/l		0.1			
Total Nitrogen (TKN)	0.550	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.35	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000997**
Client Identification **SEIMN-20200123**
Sampling Date **01/23/20, 18:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	7.	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.689	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.19	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000998**
Client Identification **SEIMS-20200123**
Sampling Date **01/23/20, 17:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	7.	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	0.96	mg/l		0.1			
Total Nitrogen (TKN)	0.745	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.22	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A000999**
Client Identification **TOSMI-20200123**
Sampling Date **01/23/20, 15:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2700	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	1.01	mg/l		0.1			
Total Nitrogen (TKN)	0.761	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.25	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A001000**
Client Identification **TOSMO-20200123**
Sampling Date **01/23/20, 16:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1700	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	1.06	mg/l		0.1			
Total Nitrogen (TKN)	0.794	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A001001**
Client Identification **TYLMI-20200123**
Sampling Date **01/23/20, 16:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	160	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.671	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A001002**
Client Identification **TYLMO-20200123**
Sampling Date **01/23/20, 16:40**

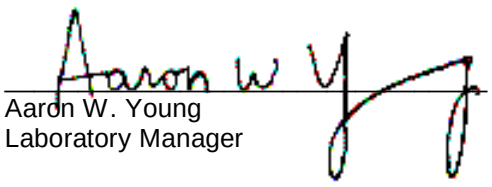
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	210	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	0.93	mg/l		0.1			
Total Nitrogen (TKN)	0.568	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	SH	01/28/20

AMTEST Identification Number **20-A001003**
Client Identification **QA80-20200123**
Sampling Date **01/23/20, 17:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	190	CFU/100 ml		1	SM 9222D	AG	01/24/20
Total Nitrogen (NOX&TKN)	1.01	mg/l		0.1			
Total Nitrogen (TKN)	0.726	mg/l		0.2	SM4500N	SH	01/31/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	SH	01/28/20



Aaron W. Young
Laboratory Manager

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Professional Analytical Services

QC Summary for sample numbers: 20-A000989 to 20-A001003

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A000994	Fecal coliform	CFU/100 ml	68.	70.	2.9
20-A001003	Fecal coliform	CFU/100 ml	190	220	15.
20-A000887	Total Nitrogen (TKN)	mg/l	0.237	0.204	15.
20-A000991	Total Nitrogen (TKN)	mg/l	0.626	0.636	1.6
20-A001001	Total Nitrogen (TKN)	mg/l	0.671	0.668	0.45
20-A001118	Total Nitrogen (TKN)	mg/l	2.52	2.51	0.40
20-A000830	Total Nitrate + Nitrite	mg/l	0.61	0.63	3.2
20-A000988	Total Nitrate + Nitrite	mg/l	1.1	1.1	0.00
20-A000998	Total Nitrate + Nitrite	mg/l	0.22	0.22	0.00
20-A001003	Total Nitrate + Nitrite	mg/l	0.28	0.28	0.00

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A000887	Total Nitrogen (TKN)	mg/l	0.237	2.23	2.00	99.65 %
20-A000991	Total Nitrogen (TKN)	mg/l	0.626	2.66	2.00	101.70 %
20-A001001	Total Nitrogen (TKN)	mg/l	0.671	2.63	2.00	97.95 %
20-A001118	Total Nitrogen (TKN)	mg/l	2.52	4.40	2.00	94.00 %
20-A000830	Total Nitrate + Nitrite	mg/l	0.61	1.6	1.0	99.00 %
20-A000988	Total Nitrate + Nitrite	mg/l	1.1	2.0	1.0	90.00 %
20-A000998	Total Nitrate + Nitrite	mg/l	0.22	1.2	1.0	98.00 %
20-A001003	Total Nitrate + Nitrite	mg/l	0.28	1.2	1.0	92.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.996	99.6 %
Total Nitrogen (TKN)	mg/l	1.00	1.00	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.95	95.0 %

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

OnSite Environmental Inc.

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

Laboratory Reference #: 01-251

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-20200123 (89)	1/23/20	17:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200123 (90)	1/23/20	15:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200123 (91)	1/23/20	15:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200123 (92)	1/23/20	16:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200123 (93)	1/23/20	16:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200123 (94)	1/23/20	17:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200123 (95)	1/23/20	17:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200123 (96)	1/23/20	18:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200123 (97)	1/23/20	18:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200123 (98)	1/23/20	17:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time
Relinquished by:	[signature]	OnSite ES	1/24/20	7:40
Received by:	[signature]	AmTest	1/24/20	7:40
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

T=1.0

P.13

OnSite Environmental Inc.

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

Laboratory Reference #: 01-251

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-20200123 999	1/23/20	15:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200123 1000	1/23/20	16:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200123 01	1/23/20	16:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200123 02	1/23/20	16:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA80-20200123 03	1/23/20	17:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time
Relinquished by:		OnSite Env. Inc.	1/24/20	740
Received by:		AmTest	1/24/20	740
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

T=1.0

CHAIN OF CUSTODY

01-251

Page 1 of 1

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.

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-2020 0123	01/23/20	1745	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020 0123		1550	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020 0123		1530	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020 0123		1605	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020 0123		1625	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020 0123		1730	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020 0123		1745	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020 0123		1820	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020 0123		1820	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020 0123		1710	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020 0123		1530	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020 0123		1605	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020 0123		1655	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020 0123		1640	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 80-2020 0123		1700	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 1/23/20 Received by _____ Date 1/23/20

Firm _____ Time 2055 Firm _____ Time 2055

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

Page 1 of 1

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-2020 0123	01/23/20	1745	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2020 0123		1550	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2020 0123		1520	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2020 0123		1605	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2020 0123		1625	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2020 0123		1730	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2020 0123		1745	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2020 0126		1820	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2020 0123		1720	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2020 0123		1710	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2020 0126		1580	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2020 0123		1605	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2020 0123		1655	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2020 0123		1640	Water	7	X	X	X	X	X	X	X	X	X			
	QA 80-2020 0123		1700	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 1/23/20 Received by _____ Date 1/29/20
Firm _____ Time 2055 Firm _____ Time 2055

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:	N. Maas, N. Bartish
Meter:	PRODSS #1
Date/Time:	1/22/20
Barometric Pressure Start of Day:	mmHg: Time: 1430
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.5	0	21.5	
Conductivity (µS/cm)	999	1,000	22.1	
Conductivity (µS/cm)	100	100	21.6	
DO % Saturation	99.5	100	21.5	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.4	0	21.3	
Conductivity (µS/cm)	99.4	100	21.5	
DO % Saturation	102.2	100	18.6	

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.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	N. Maas, N. Bartish
Meter:	Pro DSS #2
Date/Time:	1/22/20
Barometric Pressure Start of Day:	mmHg: Time:
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.6	0	22.3	
Conductivity (µS/cm)	1000	1,000	22.7	
Conductivity (µS/cm)	100	100	22.2	
DO % Saturation	100.9	100	22.3	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.4	0	22.1	
Conductivity (µS/cm)	98.9	100	22.3	
DO % Saturation	100.2	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.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 01/23/20 **Sample Time:** 1530 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1535 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, 50°F

Water Quality Sampling

Sample ID: COUMO-20200123

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: **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): 1.55

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 8.4

Specific Conductivity (µs/cm) 116.8

Dissolved Oxygen (mg/L) 11.55

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMA & BOB

Sample Date: 1.23.20 **Sample Time:** 1530 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1535 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: light rain, 53°F

Water Quality Sampling

Sample ID: TOSM1 - 20200123

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:	NA
Filter blank sample ID:	NA
Transfer blank sample ID:	NA

Visual and Olfactory Conditions:

Clarity:	cloudy
Color:	gray
Odor:	none
Sheen:	none
Floatables:	debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 0.96

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.5

Specific Conductivity (µs/cm) 91.5

Dissolved Oxygen (mg/L) 11.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH BTO

Sample Date: 1-23-20 **Sample Time:** 1625 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1643 PST: X

(Must filter within 15 minutes of collection)

SITE ID: EVALS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: light rain, 52°F

Water Quality Sampling

Sample ID: EVALSS-20200123

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:	NA
Filter blank sample ID:	NA
Transfer blank sample ID:	NA

Visual and Olfactory Conditions:

Clarity:	cloudy
Color:	dark brown
Odor:	none
Sheen:	none
Floatables:	debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 2.39

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.5

Specific Conductivity (µs/cm) 130.0

Dissolved Oxygen (mg/L) 11.72

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH & BB

Sample Date: 1.23.20 **Sample Time:** 1005 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1010

(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: light rain, 53°F

Water Quality Sampling

Sample ID: EVAMS-20200123

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:	NA
Filter blank sample ID:	NA
Transfer blank sample ID:	NA

Visual and Olfactory Conditions:

Clarity:	cloudy
Color:	gray
Odor:	sewer-type smell (septic)
Sheen:	none
Floatables:	debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 3.86

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 8.1

Specific Conductivity (µs/cm) 143.9

Dissolved Oxygen (mg/L) 11.30

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mees, N. Bartish

Sample Date: 01/23/20 **Sample Time:** 1830 PDT: PST:

Base Flow or Storm Event?

Field Filtered Time: 1835
(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, 50°F

Water Quality Sampling

Sample ID: SEIMS-20200123

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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.94

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.8

Specific Conductivity (µs/cm) 66.0

Dissolved Oxygen (mg/L) 11.46

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NMH BB

Sample Date: 1.23.20 **Sample Time:** 1710 PDT:

Base Flow or ~~Storm~~ Event? **Field Filtered Time:** 1735 PST: X

(Must filter within 15 minutes of collection)

SITE ID: ~~SEIMS-UB~~ NM SEIMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: light rain, 52°F

Water Quality Sampling

Sample ID: SEIMS-20200123

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:	N/A
Transfer blank sample ID:	N/A

Visual and Olfactory Conditions:

Clarity:	clear
Color:	light orange
Odor:	none
Sheen:	↓
Floatables:	debris

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): 0.36

Reference Point (description): to bottom of bolt

Water Quality Measurments

Temperature (°C) 6.5

Specific Conductivity (µs/cm) 38.0

Dissolved Oxygen (mg/L) 12.13

Quality Assurance

Checked By: **Signature:**

Date Checked: **Time:**

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

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 1/23/20 **Sample Time:** 1550 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1555 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, 50°F

Water Quality Sampling

Sample ID: COUM1-20200123

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.76

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 7.9

Specific Conductivity (µs/cm) 154.2

Dissolved Oxygen (mg/L) 11.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mass, N. Batish

Sample Date: 01/23/20 **Sample Time:** 1730 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1735 PST:

(Must filter within 15 minutes of collection)

SITE ID: [redacted] MONMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 50°F

Water Quality Sampling

Sample ID: MONMN-20200123

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 9.475

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 7.5

Specific Conductivity (µs/cm) 119.0

Dissolved Oxygen (mg/L) 11.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Moos, N. Barteth

Sample Date: 1/23/20 **Sample Time:** 1655 - 1700 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1700 - 1705 PST:

(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: Rainy, 50°F

Water Quality Sampling

Sample ID: TYLM1-20200123

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: QA80-20200123

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: None

Odor: None

Sheen: None

Floatables: light bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 4.29

Reference Point (description): Top of culvert

Water Quality Measurments

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 107.8

Dissolved Oxygen (mg/L) 11.73

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Muller, N. Bartish

Sample Date: 01/23/20 **Sample Time:** ~~1650~~ 1640 PDT:

Base Flow or Storm Event? **Field Filtered Time:** ~~1655~~ 1645 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, 50°F

Water Quality Sampling

Sample ID: TYLMO-20200123

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.71

Reference Point (description): Top of culvert

Water Quality Measurments

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 104.4

Dissolved Oxygen (mg/L) 11.78

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel:

Sample Date: 01/23/20 **Sample Time:** 1605 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1610 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, 50°F

Water Quality Sampling

Sample ID: TOSMO-20200123

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: light foam

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.82

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 8.5

Specific Conductivity (µs/cm) 109.1

Dissolved Oxygen (mg/L) 11.68

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Cardiff

Sample Date: 01/22/20 **Sample Time:** 1745 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1750 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, 50°F

Water Quality Sampling

Sample ID: MONMS-20200123

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:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 6.5

Reference Point (description): Top of PVC pipe

Water Quality Measurments

Temperature (°C) 7.8

Specific Conductivity (µs/cm) 183.3

Dissolved Oxygen (mg/L) 9.91

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH BBD

Sample Date: 1.23.20 **Sample Time:** 1745 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1750 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: light rain, 52°F

Water Quality Sampling

Sample ID: COLM 20200123

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:	NA
Filter blank sample ID:	NA
Transfer blank sample ID:	NA

Visual and Olfactory Conditions:

Clarity:	clear
Color:	light orange
Odor:	none
Sheen:	none
Floatables:	debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 1.27

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.8

Specific Conductivity (µs/cm) 27.9

Dissolved Oxygen (mg/L) 11.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MMH BB

Sample Date: 1.23.20 **Sample Time:** 1820 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1825 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: light rain, 52°F

Water Quality Sampling

Sample ID: MONM-2020123

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: NA

Filter blank sample ID: NA

Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: clear

Color: light brown tinge

Odor: none

Sheen: none

Floatables: debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

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) 8.2

Specific Conductivity (µs/cm) 137.0

Dissolved Oxygen (mg/L) 11.81

Data Quality Assurance Worksheet

By J. Brown

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

Date 2/18/20 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: 1/23/2020All locations, QA80 (TYLMI) Lab Ref No 2001-251

date 3/26/2020

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**	82	**±20**	0	**≤ 25**	11	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	3	**≤ 25**	1	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	5	**≤180**	≤1.0 mg/L 1.0 mg/L	106, 103	**±25**	99	**±15**	1, MS 3	**≤ 20**	5	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	4	**≤28**	≤1.0 mg/L 1.0 mg/L	100	**±25**	100	**±15**	1	**≤ 20**	3	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	96	**±25**	102	**±20**	D=0.003	**≤ 20**	2	**≤ 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	90-102	**±25**	92-100	**±20**	0.4-3 D=0-0.03	**≤ 20**	0, D=0.06	**≤ 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 2/18/20 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: 1/23/2020All locations, QA80 (TYLMI) Lab Ref No 2001-251

date 3/26/2020

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**	8	**≤180**	≤1.0 µg/L 1.0 µg/L	87, 90	**±25**	NR	**±15**	D=0.05, MS 2	**≤ 20**	D=0.1	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	8	**≤180**	≤5.0 µg/L 5.0 µg/L	98, 98	**±25**	NR	**±15**	D=0.44, MS 0	**≤ 20**	D=1	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤1.0 µg/L 1.0 µg/L	104, 106	**±25**	NR	**±15**	D=0.1, MS 2	**≤ 20**	D=0.1	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤5.0 µg/L 5.0 µg/L	108, 112	**±25**	NR	**±15**	D=0.28, MS 3	**≤ 20**	D=0.6	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	≤1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	3, 15	**≤ 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

February 19, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2002-036

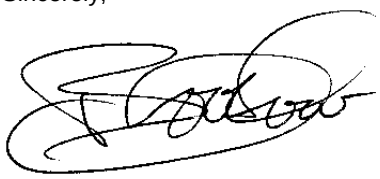
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on February 5, 2020.

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, 2020
Samples Submitted: February 5, 2020
Laboratory Reference: 2002-036
Project: 14-05806-000

Case Narrative

Samples were collected on February 5, 2020 and received by the laboratory on February 5, 2020. 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, 2020
Samples Submitted: February 5, 2020
Laboratory Reference: 2002-036
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-20200205**					
Laboratory ID:	02-036-01					
Total Suspended Solids	**6.2**	1.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**COUMI-20200205**					
Laboratory ID:	02-036-02					
Total Suspended Solids	**190**	5.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**COUMO-20200205**					
Laboratory ID:	02-036-03					
Total Suspended Solids	**54**	5.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**EVAMS-20200205**					
Laboratory ID:	02-036-04					
Total Suspended Solids	**23**	5.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**EVALSS-20200205**					
Laboratory ID:	02-036-05					
Total Suspended Solids	**100**	5.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**MONMN-20200205**					
Laboratory ID:	02-036-06					
Total Suspended Solids	**40**	2.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**MONMS-20200205**					
Laboratory ID:	02-036-07					
Total Suspended Solids	**5.0**	1.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**MONM-20200205**					
Laboratory ID:	02-036-08					
Total Suspended Solids	**23**	2.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**SEIMN-20200205**					
Laboratory ID:	02-036-09					
Total Suspended Solids	**180**	5.0	SM 2540D	2-6-20	2-7-20	

Date of Report: February 19, 2020
Samples Submitted: February 5, 2020
Laboratory Reference: 2002-036
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:	**SEIMS-20200205**					
Laboratory ID:	02-036-10					
Total Suspended Solids	**52**	2.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**TOSMI-20200205**					
Laboratory ID:	02-036-11					
Total Suspended Solids	**130**	2.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**TOSMO-20200205**					
Laboratory ID:	02-036-12					
Total Suspended Solids	**200**	5.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**TYLMI-20200205**					
Laboratory ID:	02-036-13					
Total Suspended Solids	**18**	1.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**TYLMO-20200205**					
Laboratory ID:	02-036-14					
Total Suspended Solids	**60**	2.0	SM 2540D	2-6-20	2-7-20	
Client ID:	**QA81-20200205**					
Laboratory ID:	02-036-15					
Total Suspended Solids	**22**	5.0	SM 2540D	2-6-20	2-7-20	

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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:	MB0206W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	2-6-20	2-7-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-036-10								
	ORIG	DUP							
Total Suspended Solids	**52.4**	**53.2**	NA	NA	NA	NA	2	23	
SPIKE BLANK									
Laboratory ID:	SB0206W1								
	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-20200205**					
Laboratory ID:	02-036-01					
Turbidity	**1.5**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**COUMI-20200205**					
Laboratory ID:	02-036-02					
Turbidity	**63**	0.20	EPA 180.1	2-5-20	2-5-20	
Client ID:	**COUMO-20200205**					
Laboratory ID:	02-036-03					
Turbidity	**28**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**EVAMS-20200205**					
Laboratory ID:	02-036-04					
Turbidity	**12**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**EVALSS-20200205**					
Laboratory ID:	02-036-05					
Turbidity	**33**	0.20	EPA 180.1	2-5-20	2-5-20	
Client ID:	**MONMN-20200205**					
Laboratory ID:	02-036-06					
Turbidity	**19**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**MONMS-20200205**					
Laboratory ID:	02-036-07					
Turbidity	**8.6**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**MONM-20200205**					
Laboratory ID:	02-036-08					
Turbidity	**15**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**SEIMN-20200205**					
Laboratory ID:	02-036-09					
Turbidity	**65**	0.20	EPA 180.1	2-5-20	2-5-20	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200205**					
Laboratory ID:	02-036-10					
Turbidity	**17**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**TOSMI-20200205**					
Laboratory ID:	02-036-11					
Turbidity	**31**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**TOSMO-20200205**					
Laboratory ID:	02-036-12					
Turbidity	**78**	0.20	EPA 180.1	2-5-20	2-5-20	
Client ID:	**TYLMI-20200205**					
Laboratory ID:	02-036-13					
Turbidity	**14**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**TYLMO-20200205**					
Laboratory ID:	02-036-14					
Turbidity	**24**	0.10	EPA 180.1	2-5-20	2-5-20	
Client ID:	**QA81-20200205**					
Laboratory ID:	02-036-15					
Turbidity	**13**	0.10	EPA 180.1	2-5-20	2-5-20	

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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:	MB0205W1					
Turbidity	**ND**	0.10	EPA 180.1	2-5-20	2-5-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-036-01								
	ORIG	DUP							
Turbidity	**1.45**	**1.43**	NA	NA	NA	NA	1	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-20200205**					
Laboratory ID:	02-036-01					
Hardness	**6.4**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**COUMI-20200205**					
Laboratory ID:	02-036-02					
Hardness	**47**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**COUMO-20200205**					
Laboratory ID:	02-036-03					
Hardness	**33**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**EVAMS-20200205**					
Laboratory ID:	02-036-04					
Hardness	**43**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**EVALSS-20200205**					
Laboratory ID:	02-036-05					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**MONMN-20200205**					
Laboratory ID:	02-036-06					
Hardness	**32**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**MONMS-20200205**					
Laboratory ID:	02-036-07					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	

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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-20200205**					
Laboratory ID:	02-036-08					
Hardness	**35**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**SEIMN-20200205**					
Laboratory ID:	02-036-09					
Hardness	**18**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**SEIMS-20200205**					
Laboratory ID:	02-036-10					
Hardness	**21**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**TOSMI-20200205**					
Laboratory ID:	02-036-11					
Hardness	**24**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**TOSMO-20200205**					
Laboratory ID:	02-036-12					
Hardness	**37**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**TYLMI-20200205**					
Laboratory ID:	02-036-13					
Hardness	**29**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	
Client ID:	**TYLMO-20200205**					
Laboratory ID:	02-036-14					
Hardness	**26**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	

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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:	**QA81-20200205**					
Laboratory ID:	02-036-15					
Hardness	**45**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	

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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:	MB0206WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	2-6-20	2-6-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-036-07										
	ORIG	DUP									
Hardness	**41.9**	**42.1**	NA		NA	NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	02-036-07										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**179**	**178**	132	132	41.9	104	103	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0206WH1										
	SB		SB			SB					
Hardness	**127**		132		NA	96		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-20200205**					
Laboratory ID:	02-036-01					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**COUMI-20200205**					
Laboratory ID:	02-036-02					
Dissolved Organic Carbon	**7.8**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**COUMO-20200205**					
Laboratory ID:	02-036-03					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**EVAMS-20200205**					
Laboratory ID:	02-036-04					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**EVALSS-20200205**					
Laboratory ID:	02-036-05					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**MONMN-20200205**					
Laboratory ID:	02-036-06					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**MONMS-20200205**					
Laboratory ID:	02-036-07					
Dissolved Organic Carbon	**7.5**	1.0	SM 5310B	2-12-20	2-12-20	

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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-20200205**					
Laboratory ID:	02-036-08					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**SEIMN-20200205**					
Laboratory ID:	02-036-09					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**SEIMS-20200205**					
Laboratory ID:	02-036-10					
Dissolved Organic Carbon	**9.4**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**TOSMI-20200205**					
Laboratory ID:	02-036-11					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**TOSMO-20200205**					
Laboratory ID:	02-036-12					
Dissolved Organic Carbon	**7.2**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**TYLMI-20200205**					
Laboratory ID:	02-036-13					
Dissolved Organic Carbon	**7.8**	1.0	SM 5310B	2-12-20	2-12-20	
Client ID:	**TYLMO-20200205**					
Laboratory ID:	02-036-14					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	2-12-20	2-12-20	

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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:	**QA81-20200205**					
Laboratory ID:	02-036-15					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	2-12-20	2-12-20	

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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	2-12-20	2-12-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-036-10								
	ORIG	DUP							
Dissolved Organic Carbon	**9.38**	**9.78**	NA	NA	NA	NA	4	15	
MATRIX SPIKE									
Laboratory ID:	02-036-10								
	MS		MS		MS				
Dissolved Organic Carbon	**19.9**		10.0	9.38	105	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0212D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.3**		10.0	NA	103	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-20200205**					
Laboratory ID:	02-036-01					
Total Phosphorus	**0.021**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**COUMI-20200205**					
Laboratory ID:	02-036-02					
Total Phosphorus	**0.28**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**COUMO-20200205**					
Laboratory ID:	02-036-03					
Total Phosphorus	**0.14**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**EVAMS-20200205**					
Laboratory ID:	02-036-04					
Total Phosphorus	**0.066**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**EVALSS-20200205**					
Laboratory ID:	02-036-05					
Total Phosphorus	**0.15**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**MONMN-20200205**					
Laboratory ID:	02-036-06					
Total Phosphorus	**0.11**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**MONMS-20200205**					
Laboratory ID:	02-036-07					
Total Phosphorus	**0.049**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**MONM-20200205**					
Laboratory ID:	02-036-08					
Total Phosphorus	**0.075**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**SEIMN-20200205**					
Laboratory ID:	02-036-09					
Total Phosphorus	**0.22**	0.010	EPA 365.1	2-10-20	2-11-20	

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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:	**SEIMS-20200205**					
Laboratory ID:	02-036-10					
Total Phosphorus	**0.091**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**TOSMI-20200205**					
Laboratory ID:	02-036-11					
Total Phosphorus	**0.16**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**TOSMO-20200205**					
Laboratory ID:	02-036-12					
Total Phosphorus	**0.31**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**TYLMI-20200205**					
Laboratory ID:	02-036-13					
Total Phosphorus	**0.084**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**TYLMO-20200205**					
Laboratory ID:	02-036-14					
Total Phosphorus	**0.11**	0.010	EPA 365.1	2-10-20	2-11-20	
Client ID:	**QA81-20200205**					
Laboratory ID:	02-036-15					
Total Phosphorus	**0.064**	0.010	EPA 365.1	2-10-20	2-11-20	

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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:	MB0210W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	2-10-20	2-11-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-036-01								
	ORIG	DUP							
Total Phosphorus	**0.0206**	**0.0214**	NA	NA	NA	NA	4	14	
MATRIX SPIKE									
Laboratory ID:	02-036-01								
	MS		MS		MS				
Total Phosphorus	**0.263**		0.250	0.0206	97	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0210W1								
	SB		SB		SB				
Total Phosphorus	**0.253**		0.250	NA	101	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-20200205**					
Laboratory ID:	02-036-01					
Copper	**ND**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**ND**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**COUMI-20200205**					
Laboratory ID:	02-036-02					
Copper	**6.7**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**34**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**COUMO-20200205**					
Laboratory ID:	02-036-03					
Copper	**4.6**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**35**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**EVAMS-20200205**					
Laboratory ID:	02-036-04					
Copper	**2.0**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**10**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**EVALSS-20200205**					
Laboratory ID:	02-036-05					
Copper	**3.7**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**12**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**MONMN-20200205**					
Laboratory ID:	02-036-06					
Copper	**2.9**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**12**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**MONMS-20200205**					
Laboratory ID:	02-036-07					
Copper	**2.3**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**7.5**	5.0	EPA 200.8	2-10-20	2-10-20	

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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-20200205**					
Laboratory ID:	02-036-08					
Copper	**2.3**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**14**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**SEIMN-20200205**					
Laboratory ID:	02-036-09					
Copper	**5.9**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**12**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**SEIMS-20200205**					
Laboratory ID:	02-036-10					
Copper	**1.6**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**6.2**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**TOSMI-20200205**					
Laboratory ID:	02-036-11					
Copper	**6.9**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**68**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**TOSMO-20200205**					
Laboratory ID:	02-036-12					
Copper	**9.8**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**87**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**TYLMI-20200205**					
Laboratory ID:	02-036-13					
Copper	**3.3**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**14**	5.0	EPA 200.8	2-10-20	2-10-20	
Client ID:	**TYLMO-20200205**					
Laboratory ID:	02-036-14					
Copper	**4.9**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**25**	5.0	EPA 200.8	2-10-20	2-10-20	

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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:	**QA81-20200205**					
Laboratory ID:	02-036-15					
Copper	**1.7**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**8.8**	5.0	EPA 200.8	2-10-20	2-10-20	

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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:	MB0210WH1					
Copper	**ND**	1.0	EPA 200.8	2-10-20	2-10-20	
Zinc	**ND**	5.0	EPA 200.8	2-10-20	2-10-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-036-04										
	ORIG	DUP									
Copper	**2.04**	**1.87**	NA	NA		NA		NA	9	20	
Zinc	**10.1**	**9.74**	NA	NA		NA		NA	4	20	
MATRIX SPIKES											
Laboratory ID:	02-036-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**99.6**	**96.2**	100	100	2.04	**98**	**94**	75-125	3	20	
Zinc	**103**	**101**	100	100	10.1	**93**	**91**	75-125	2	20	

Date of Report: February 19, 2020
Samples Submitted: February 5, 2020
Laboratory Reference: 2002-036
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-20200205**					
Laboratory ID:	02-036-01					
Copper	**ND**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	
Client ID:	**COUMI-20200205**					
Laboratory ID:	02-036-02					
Copper	**1.8**	1.0	EPA 200.8		2-10-20	
Zinc	**8.3**	5.0	EPA 200.8		2-10-20	
Client ID:	**COUMO-20200205**					
Laboratory ID:	02-036-03					
Copper	**1.8**	1.0	EPA 200.8		2-10-20	
Zinc	**17**	5.0	EPA 200.8		2-10-20	
Client ID:	**EVAMS-20200205**					
Laboratory ID:	02-036-04					
Copper	**1.1**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	
Client ID:	**EVALSS-20200205**					
Laboratory ID:	02-036-05					
Copper	**1.1**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	
Client ID:	**MONMN-20200205**					
Laboratory ID:	02-036-06					
Copper	**1.3**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	
Client ID:	**MONMS-20200205**					
Laboratory ID:	02-036-07					
Copper	**1.7**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	

Date of Report: February 19, 2020
Samples Submitted: February 5, 2020
Laboratory Reference: 2002-036
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-20200205**					
Laboratory ID:	02-036-08					
Copper	**1.3**	1.0	EPA 200.8		2-10-20	
Zinc	**6.2**	5.0	EPA 200.8		2-10-20	
Client ID:	**SEIMN-20200205**					
Laboratory ID:	02-036-09					
Copper	**ND**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	
Client ID:	**SEIMS-20200205**					
Laboratory ID:	02-036-10					
Copper	**ND**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	
Client ID:	**TOSMI-20200205**					
Laboratory ID:	02-036-11					
Copper	**2.2**	1.0	EPA 200.8		2-10-20	
Zinc	**33**	5.0	EPA 200.8		2-10-20	
Client ID:	**TOSMO-20200205**					
Laboratory ID:	02-036-12					
Copper	**2.0**	1.0	EPA 200.8		2-10-20	
Zinc	**20**	5.0	EPA 200.8		2-10-20	
Client ID:	**TYLMI-20200205**					
Laboratory ID:	02-036-13					
Copper	**1.9**	1.0	EPA 200.8		2-10-20	
Zinc	**10**	5.0	EPA 200.8		2-10-20	
Client ID:	**TYLMO-20200205**					
Laboratory ID:	02-036-14					
Copper	**2.0**	1.0	EPA 200.8		2-10-20	
Zinc	**10**	5.0	EPA 200.8		2-10-20	

Date of Report: February 19, 2020
Samples Submitted: February 5, 2020
Laboratory Reference: 2002-036
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:	**QA81-20200205**					
Laboratory ID:	02-036-15					
Copper	**1.1**	1.0	EPA 200.8		2-10-20	
Zinc	**5.6**	5.0	EPA 200.8		2-10-20	

Date of Report: February 19, 2020
Samples Submitted: February 5, 2020
Laboratory Reference: 2002-036
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:	MB0210D1					
Copper	**ND**	1.0	EPA 200.8		2-10-20	
Zinc	**ND**	5.0	EPA 200.8		2-10-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-036-15										
	ORIG	DUP									
Copper	**1.06**	**1.15**	NA	NA		NA		NA	7	20	
Zinc	**5.64**	**5.80**	NA	NA		NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	02-036-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**72.2**	**72.6**	80.0	80.0	1.06	**89**	**89**	75-125	1	20	
Zinc	**83.0**	**83.4**	80.0	80.0	5.64	**97**	**97**	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

Feb 19 2020
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-20200205	Water	20-A001568	Micro, NUT
COUMI-20200205	Water	20-A001569	Micro, NUT
COUMO-20200205	Water	20-A001570	Micro, NUT
EVAMS-20200205	Water	20-A001571	Micro, NUT
EVALSS-20200205	Water	20-A001572	Micro, NUT
MONMN-20200205	Water	20-A001573	Micro, NUT
MONMS-20200205	Water	20-A001574	Micro, NUT
MONM-20200205	Water	20-A001575	Micro, NUT
SEIMN-20200205	Water	20-A001576	Micro, NUT
SEIMS-20200205	Water	20-A001577	Micro, NUT
TOSMI-20200205	Water	20-A001578	Micro, NUT
TOSMO-20200205	Water	20-A001579	Micro, NUT
TYLMI-20200205	Water	20-A001580	Micro, NUT
TYLMO-20200205	Water	20-A001581	Micro, NUT
QA81-20200205	Water	20-A001582	Micro, NUT

Your samples were received on Wednesday, February 5, 2020. 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 2020
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

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

Am Test Inc.
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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
All results reported on an as received basis.

Date Received: 02/05/20
Date Reported: 2/19/20

AMTEST Identification Number **20-A001568**
Client Identification **COLM-20200205**
Sampling Date **02/05/20, 09:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	9.	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	0.63	mg/l		0.1			
Total Nitrogen (TKN)	0.631	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001569**
Client Identification **COUMI-20200205**
Sampling Date **02/05/20, 07:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	420	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.16	mg/l		0.1			
Total Nitrogen (TKN)	0.779	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.38	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001570**
Client Identification **COUMO-20200205**
Sampling Date **02/05/20, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	100	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.17	mg/l		0.1			
Total Nitrogen (TKN)	0.814	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001571**
Client Identification **EVAMS-20200205**
Sampling Date **02/05/20, 08:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	280	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.91	mg/l		0.1			
Total Nitrogen (TKN)	1.06	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.85	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001572**
Client Identification **EVALSS-20200205**
Sampling Date **02/05/20, 08:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	220	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.95	mg/l		0.1			
Total Nitrogen (TKN)	1.25	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.70	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001573**
Client Identification **MONMN-20200205**
Sampling Date **02/05/20, 09:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	960	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	0.90	mg/l		0.1			
Total Nitrogen (TKN)	0.649	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.25	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001574**
Client Identification **MONMS-20200205**
Sampling Date **02/05/20, 09:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.11	mg/l		0.1			
Total Nitrogen (TKN)	0.697	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.41	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001575**
Client Identification **MONM-20200205**
Sampling Date **02/05/20, 10:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	360	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.06	mg/l		0.1			
Total Nitrogen (TKN)	0.710	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.35	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001576**
Client Identification **SEIMN-20200205**
Sampling Date **02/05/20, 09:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	80.	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.00	mg/l		0.1			
Total Nitrogen (TKN)	0.880	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.12	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001577**
Client Identification **SEIMS-20200205**
Sampling Date **02/05/20, 10:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	320	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.19	mg/l		0.1			
Total Nitrogen (TKN)	0.977	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.21	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001578**
Client Identification **TOSMI-20200205**
Sampling Date **02/05/20, 07:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	160	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	0.99	mg/l		0.1			
Total Nitrogen (TKN)	0.816	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.17	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001579**
Client Identification **TOSMO-20200205**
Sampling Date **02/05/20, 08:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	340	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.37	mg/l		0.1			
Total Nitrogen (TKN)	1.12	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.25	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001580**
Client Identification **TYLMI-20200205**
Sampling Date **02/05/20, 09:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	160	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.06	mg/l		0.1			
Total Nitrogen (TKN)	0.801	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001581**
Client Identification **TYLMO-20200205**
Sampling Date **02/05/20, 08:35**

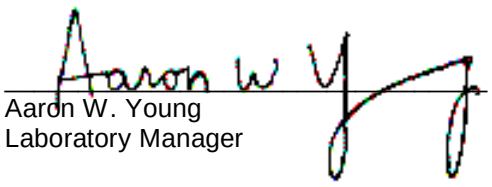
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	400	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.14	mg/l		0.1			
Total Nitrogen (TKN)	0.876	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	SH	02/11/20

AMTEST Identification Number **20-A001582**
Client Identification **QA81-20200205**
Sampling Date **02/05/20, 08:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	380	CFU/100 ml		1	SM 9222D	JM	02/05/20
Total Nitrogen (NOX&TKN)	1.83	mg/l		0.1			
Total Nitrogen (TKN)	1.02	mg/l		0.2	SM4500N	SH	02/14/20
Total Nitrate + Nitrite	0.81	mg/l		0.02	SM4500NO3	SH	02/11/20



Aaron W. Young
Laboratory Manager

Am Test Inc.
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Professional Analytical Services

QC Summary for sample numbers: 20-A001568 to 20-A001582

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A001568	Fecal coliform	CFU/100 ml	9.	5.	57.
20-A001579	Fecal coliform	CFU/100 ml	340	400	16.
20-A001556	Total Nitrogen (TKN)	mg/l	1.11	1.03	7.5
20-A001574	Total Nitrogen (TKN)	mg/l	0.697	0.690	1.0
20-A001598	Total Nitrogen (TKN)	mg/l	1.39	1.37	1.4
20-A001616	Total Nitrogen (TKN)	mg/l	0.210	0.216	2.8
20-A001730	Total Nitrogen (TKN)	mg/l	6.01	5.84	2.9
20-A001402	Total Nitrate + Nitrite	mg/l	1.8	1.8	0.00
20-A001412	Total Nitrate + Nitrite	mg/l	1.0	1.1	9.5
20-A001556	Total Nitrate + Nitrite	mg/l	0.58	0.57	1.7
20-A001574	Total Nitrate + Nitrite	mg/l	0.41	0.42	2.4
20-A001598	Total Nitrate + Nitrite	mg/l	3.2	3.5	9.0
20-A001744	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
20-A001746	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A001556	Total Nitrogen (TKN)	mg/l	1.11	3.20	2.00	104.50 %
20-A001574	Total Nitrogen (TKN)	mg/l	0.697	2.76	2.00	103.15 %
20-A001598	Total Nitrogen (TKN)	mg/l	1.39	3.47	2.00	104.00 %
20-A001616	Total Nitrogen (TKN)	mg/l	0.210	2.33	2.00	106.00 %
20-A001730	Total Nitrogen (TKN)	mg/l	6.01	17.0	10.0	109.90 %
20-A001402	Total Nitrate + Nitrite	mg/l	1.8	2.6	1.0	80.00 %
20-A001412	Total Nitrate + Nitrite	mg/l	1.0	2.1	1.0	110.00 %
20-A001556	Total Nitrate + Nitrite	mg/l	0.58	1.6	1.0	102.00 %
20-A001574	Total Nitrate + Nitrite	mg/l	0.41	1.4	1.0	99.00 %
20-A001598	Total Nitrate + Nitrite	mg/l	3.2	14.	10.	108.00 %
20-A001744	Total Nitrate + Nitrite	mg/l	< 0.02	0.99	1.0	99.00 %
20-A001746	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	1.05	105. %
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	1.0	100. %
Total Nitrate + Nitrite	mg/l	1.0	0.94	94.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %

QC Summary for sample numbers: 20-A001568 to 20-A001582...

STANDARD REFERENCE MATERIALS continued....

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrate + Nitrite	mg/l	0.50	0.49	98.0 %
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	< 0.2
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
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

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

Laboratory Reference #: 02-036

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-20200205 1568	2/5/20	9:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200205 69	2/5/20	7:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200205 70	2/5/20	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200205 71	2/5/20	8:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200205 72	2/5/20	8:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200205 73	2/5/20	9:20	Water	2	Fecal Coliform SM 9222D, Tota Nitrogen SM 4500-N
7	MONMS-20200205 74	2/5/20	9:35	Water	2	Fecal Coliform SM 9222D, Tota Nitrogen SM 4500-N
8	MONM-20200205 75	2/5/20	10:15	Water	2	Fecal Coliform SM 9222D, Tota Nitrogen SM 4500-N
9	SEIMN-20200205 76	2/5/20	9:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200205 77	2/5/20	10:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	[signature]	OSE	2/5/20	1410	
Received by:	[signature]	Amtest	2/5/20	1410	EDDs - CSV
Relinquished by:					Reporting Limits:
Received by:					Fecal Coliform - 1.0 cfu/100ml
Relinquished by:					Total Nitrogen - .10 mg/L
Received by:					

T=3.0

OnSite Environmental Inc.

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Laboratory Reference #: 02-036

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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-20200205 1578	2/5/20	7:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200205 79	2/5/20	8:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200205 80	2/5/20	9:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200205 81	2/5/20	8:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA81-20200205 82	2/5/20	8:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by: Kitten Liveen	OSE	2/5/20	1410	EDDs - CSV
Received by:	Amtest	2/5/20	1410	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
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. 02-036

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-20200205	20200205	0950	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-20200205		0745	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-20200205		0730	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-20200205		0810	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-20200205		0840	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-20200205		0920	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-20200205		0935	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-20200205		1015	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-20200205		0915	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-20200205		1010	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-20200205		0730	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-20200205		0885	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-20200205		0900	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-20200205		0835	Water	7	X	X	X	X	X	X	X	X	X			
15	QA81-20200205	20200205	0820	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 2/5/20 Received by _____ Date 2/5/20
Firm Herrera Time 1040 Firm OSE Time 1040

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. 02-036

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-20200205	20200205	0950	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-20200205		0745	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-20200205		0730	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-20200205		0810	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-20200205		0840	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-20200205		0920	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-20200205		0935	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-20200205		1015	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-20200205		0915	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-20200205		1010	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-20200205		0730	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-20200205		0885	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-20200205		0900	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-20200205		0835	Water	7	X	X	X	X	X	X	X	X	X			
15	QA81-20200205	20200205	0820	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 2/5/20 Received by _____ Date 2/5/20
Firm Herrera Time 1040 Firm OSE Time 1040

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 Pro Plus
Date/Time:	2.4.20 / 15:50
Barometric Pressure Start of Day:	mmHg: 766.8 Time: 15:50
Barometric Pressure End of Day:	mmHg: 760.2 Time: 11:30 / 2.5.20

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.1	0	23.0	Herrera DI water
Conductivity (µS/cm)	1000	1,000	19.5	
Conductivity (µS/cm)	100.3	100	21.9	
DO % Saturation	100.3	100	20.9	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.9	0	20.8	Herrera DI water
Conductivity (µS/cm)	99.5	100	21.0	
DO % Saturation	93.5	100	18.6	

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.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	M Mullen
Meter:	YSI Pro DSS #2
Date/Time:	2.4.20 / 15:50
Barometric Pressure Start of Day:	mmHg: ~~27~~772.6 Time: 15:50
Barometric Pressure End of Day:	mmHg: 746.5 Time: 11:30 / 2.5.20

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.9	0	22.5	Herrera DI water
Conductivity (µS/cm)	1004	1,000	21.4	
Conductivity (µS/cm)	101.3	100	21.7	OK
DO % Saturation	101.2	100	21.1	towel to calibrate; ~~stuck~~ stuck @ 101.6

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.2	0	20.7	Herrera DI water
Conductivity (µS/cm)	100.2	100	21.3	
DO % Saturation	100.8	100	20.3	

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: NL / NM

Sample Date: 20200205 **Sample Time:** ~~PDT~~ 0950 PDT:

Base Flow or Storm Event? **Field Filtered Time:** ~~PDT~~ 0955 PST: X

(Must filter within 15 minutes of collection)

SITE ID: EOLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp:

Water Quality Sampling

Sample ID: EOLM-20200205

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:	Red / Yellow (Tannin)
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 6.46

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.0

Specific Conductivity (µs/cm) 28.8

Dissolved Oxygen (mg/L) 12.28

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NB

Sample Date: 2-5-20 **Sample Time:** 745 PDT: x

Base Flow or Storm Event? (B) **Field Filtered Time:** 750 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: rainy 40°

Water Quality Sampling

Sample ID: COUMI-20200205

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: **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) 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): 2.76

Reference Point (description): 5 G

Water Quality Measurments

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 95.0

Dissolved Oxygen (mg/L) 12.45

* NO GLOVES

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NB

Sample Date: 2.5.20 **Sample Time:** 7:30 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 7:35 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: COUMO-20200205

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: **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) 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): 1.82

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.8

Specific Conductivity (µs/cm) 75.6

Dissolved Oxygen (mg/L) 10.10

* NO GLOVES

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NM, NL

Sample Date: 20200205 **Sample Time:** 0810/0820 PDT: PST: X

Base Flow or Storm Event? (S)

Field Filtered Time: 0815/0825 (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, MID 40S

Water Quality Sampling

Sample ID: EVAMS-20200205

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: QA81-20200205

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID

Color: LIGHT BROWN / YELLOW

Odor: ORGANIC

Sheen: N/A

Floatables: SOME FOAM

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): MID 4.10

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 102.8

Dissolved Oxygen (mg/L) 12.11

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NM, NL

Sample Date: 20200205 **Sample Time:** 0840 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0845 PST: X

(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: MID 40s, RAINY

Water Quality Sampling

Sample ID: EVALSS-20200205

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:	BROWN/YELLOW
Odor:	N/A
Sheen:	NONE
Floatables:	NONE

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.64

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.3

Specific Conductivity (µs/cm) 91.0

Dissolved Oxygen (mg/L) 12.46

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NB

Sample Date: 2-5-26 **Sample Time:** 9:20 PDT: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 9:25 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-20200205

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:	turbid
Color:	brown
Odor:	—
Sheen:	—
Floatables:	—

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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) 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): 9.65

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.0

Specific Conductivity (µs/cm) 84.9

Dissolved Oxygen (mg/L) 12.72

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NB

Sample Date: 2.5.20 **Sample Time:** 935 PDT: X

Base Flow or Storm Event? (0) **Field Filtered Time:** 940 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: raing 45°

Water Quality Sampling

Sample ID: MONMS.20200205

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: **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) 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): 6.08

Reference Point (description): top of PVC pipe down

Water Quality Measurments

Temperature (°C) 6.0

Specific Conductivity (µs/cm) 119.9

Dissolved Oxygen (mg/L) 11.05

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NM/NL

Sample Date: 20200205 **Sample Time:** 1015 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1020 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: MID 40S, RAINY

Water Quality Sampling

Sample ID: MONM-20200205

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:	~~EO~~ slightly turbid
Color:	light muddy brown
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): N/A

Reference Point (description): ~~BOK~~ N/A

Water Quality Measurments

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 96.8

Dissolved Oxygen (mg/L) 12.48

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL, NM

Sample Date: 20200205 **Sample Time:** 0915 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0920 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: MID 40S, RAINY

Water Quality Sampling

Sample ID: SEIMN-20200205

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:	LIGHT BROWN
Odor:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.24

Reference Point (description): TOP OF BOLT

Water Quality Measurments

Temperature (°C) 5.1

Specific Conductivity (µs/cm) 32.1

Dissolved Oxygen (mg/L) 12.68

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NP

Sample Date: 2.5.20 **Sample Time:** 1010 PDT: X

Base Flow or Storm Event? (S) **Field Filtered Time:** 1015 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 45°

Water Quality Sampling

Sample ID: SEIMS.20200205

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:	turbid
Color:	yellow/brown
Odor:	–
Sheen:	–
Floatables:	–

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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) 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): 1.10

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.9

Specific Conductivity (µs/cm) 47.3

Dissolved Oxygen (mg/L) 12.17

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NM, NL

Sample Date: 20200205 **Sample Time:** 0730 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 0735 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: Rain MID 40s

Water Quality Sampling

Sample ID: TOSM12020205

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: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 1.18

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 43.0

Dissolved Oxygen (mg/L) 12.37

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NB

Sample Date: 2.5.20 **Sample Time:** 805 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 810 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 40°

Water Quality Sampling

Sample ID: TOSMO-20200205

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: **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) 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): 1.10

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.6

Specific Conductivity (µs/cm) 70.0

Dissolved Oxygen (mg/L) 10.90

* NO GLOVES

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NB

Sample Date: 2.5.20 **Sample Time:** 900 PDT: X

Base Flow or Storm Event? (Storm) **Field Filtered Time:** 905 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 45-

Water Quality Sampling

Sample ID: TYLM1-20200205

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 turbidity
Color:	yellow/brown
Odor:	—
Sheen:	—
Floatables:	some bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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) 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): 4.17

Reference Point (description): top of culvert down

Water Quality Measurments

Temperature (°C) 5.6

Specific Conductivity (µs/cm) 73.8

Dissolved Oxygen (mg/L) 12.93

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + NB

Sample Date: 2.5.20 **Sample Time:** 835 PDT: X

Base Flow or Storm Event? (circle) **Field Filtered Time:** 840 PST:

(Must filter within 15 minutes of collection)

SITE ID: ~~TOSMO~~ TYLMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: rainy 40°

Water Quality Sampling

Sample ID: TYLMO-20200205

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: **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) 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): 2.50

Reference Point (description): top of culvert down

Water Quality Measurments

Temperature (°C) 6.1

Specific Conductivity (µs/cm) 60.5

Dissolved Oxygen (mg/L) 12.05

Data Quality Assurance Worksheet

By J. Brown

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

Date 2/28/20 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: 2/5/2020 /All locations, QA81 (EVAMS) Lab Ref No 2002-036

date 3/26/2020

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=1	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	1	**≤ 25**	8	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	1	**≤180**	≤1.0 mg/L 1.0 mg/L	104, 103	**±25**	96	**±15**	0.5 MS 1	**≤ 20**	5	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	7	**≤28**	≤1.0 mg/L 1.0 mg/L	105	**±25**	103	**±15**	4	**≤ 20**	9	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	6	**≤28**	≤0.01 mg/L 0.01 mg/L	97	**±25**	101	**±20**	D=0.001	**≤ 20**	3	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	9	**≤28**	≤0.1 mg/L 0.1 mg/L	80-110	**±25**	94-105	**±20**	NC, 0-10, D=0.01 D=0.01	**≤ 20**	4, 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; 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 2/28/20 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: 2/5/2020 /All locations, QA81 (EVAMS) Lab Ref No 2002-036

date 3/26/2020

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, 94	**±25**	NR	**±15**	D=0.2 MS 3	**≤ 20**	D=0.3	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	93, 91	**±25**	NR	**±15**	D=0.4 MS 2	**≤ 20**	D=1.2	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	89, 89	**±25**	NR	**±15**	D=0.1 MS 1	**≤ 20**	D=0	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	97, 97	**±25**	NR	**±15**	D=0.2 MS 0.5	**≤ 20**	D=0.6	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	<1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	D=4, 16	**≤ 35**	30	**≤ 50**	OK	NO FLAG FOR SLIGHT LAB DUPE DIFFERENCE EXCEEDANCE, OTHER DUPES OK.

[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

March 17, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2002-200

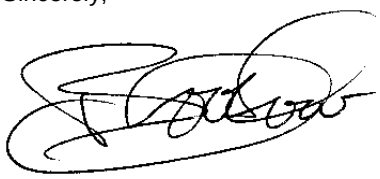
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on February 20, 2020.

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 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
Project: 14-05806-000

Case Narrative

Samples were collected on February 20, 2020 and received by the laboratory on February 20, 2020. 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 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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-20200220**					
Laboratory ID:	02-200-01					
Total Suspended Solids	**ND**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**COUMI-20200220**					
Laboratory ID:	02-200-02					
Total Suspended Solids	**3.8**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**COUMO-20200220**					
Laboratory ID:	02-200-03					
Total Suspended Solids	**3.8**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**EVAMS-20200220**					
Laboratory ID:	02-200-04					
Total Suspended Solids	**1.6**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**EVALSS-20200220**					
Laboratory ID:	02-200-05					
Total Suspended Solids	**2.2**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**MONMN-20200220**					
Laboratory ID:	02-200-06					
Total Suspended Solids	**ND**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**MONMS-20200220**					
Laboratory ID:	02-200-07					
Total Suspended Solids	**1.2**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**MONM-20200220**					
Laboratory ID:	02-200-08					
Total Suspended Solids	**40**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**SEIMN-20200220**					
Laboratory ID:	02-200-09					
Total Suspended Solids	**8.6**	1.0	SM 2540D	2-21-20	2-24-20	

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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:	**SEIMS-20200220**					
Laboratory ID:	02-200-10					
Total Suspended Solids	**4.0**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**TOSMI-20200220**					
Laboratory ID:	02-200-11					
Total Suspended Solids	**3.8**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**TOSMO-20200220**					
Laboratory ID:	02-200-12					
Total Suspended Solids	**ND**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**TYLMI-20200220**					
Laboratory ID:	02-200-13					
Total Suspended Solids	**33**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**TYLMO-20200220**					
Laboratory ID:	02-200-14					
Total Suspended Solids	**4.0**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**QA81-20200220**					
Laboratory ID:	02-200-15					
Total Suspended Solids	**4.0**	1.0	SM 2540D	2-21-20	2-24-20	
Client ID:	**QA83-20200220**					
Laboratory ID:	02-200-17					
Total Suspended Solids	**ND**	1.0	SM 2540D	2-21-20	2-24-20	

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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:	MB0221W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	2-21-20	2-24-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-200-02								
	ORIG	DUP							
Total Suspended Solids	**3.80**	**4.20**	NA	NA	NA	NA	10	23	
SPIKE BLANK									
Laboratory ID:	SB0221W1								
	SB		SB		SB				
Total Suspended Solids	**104**		100	NA	104	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-20200220**					
Laboratory ID:	02-200-01					
Turbidity	**0.66**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**COUMI-20200220**					
Laboratory ID:	02-200-02					
Turbidity	**2.3**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**COUMO-20200220**					
Laboratory ID:	02-200-03					
Turbidity	**2.2**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**EVAMS-20200220**					
Laboratory ID:	02-200-04					
Turbidity	**1.3**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**EVALSS-20200220**					
Laboratory ID:	02-200-05					
Turbidity	**1.5**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**MONMN-20200220**					
Laboratory ID:	02-200-06					
Turbidity	**1.6**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**MONMS-20200220**					
Laboratory ID:	02-200-07					
Turbidity	**1.2**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**MONM-20200220**					
Laboratory ID:	02-200-08					
Turbidity	**7.6**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**SEIMN-20200220**					
Laboratory ID:	02-200-09					
Turbidity	**3.7**	0.10	EPA 180.1	2-21-20	2-21-20	

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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200220**					
Laboratory ID:	02-200-10					
Turbidity	**1.8**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**TOSMI-20200220**					
Laboratory ID:	02-200-11					
Turbidity	**1.8**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**TOSMO-20200220**					
Laboratory ID:	02-200-12					
Turbidity	**1.3**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**TYLMI-20200220**					
Laboratory ID:	02-200-13					
Turbidity	**8.4**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**TYLMO-20200220**					
Laboratory ID:	02-200-14					
Turbidity	**1.8**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**QA81-20200220**					
Laboratory ID:	02-200-15					
Turbidity	**2.2**	0.10	EPA 180.1	2-21-20	2-21-20	
Client ID:	**QA83-20200220**					
Laboratory ID:	02-200-17					
Turbidity	**ND**	0.10	EPA 180.1	2-21-20	2-21-20	

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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:	MB0221W1					
Turbidity	**ND**	0.10	EPA 180.1	2-21-20	2-21-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-200-01								
	ORIG	DUP							
Turbidity	**0.660**	**0.740**	NA	NA	NA	NA	11	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-20200220**					
Laboratory ID:	02-200-01					
Hardness	**7.4**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**COUMI-20200220**					
Laboratory ID:	02-200-02					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**COUMO-20200220**					
Laboratory ID:	02-200-03					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**EVAMS-20200220**					
Laboratory ID:	02-200-04					
Hardness	**76**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**EVALSS-20200220**					
Laboratory ID:	02-200-05					
Hardness	**71**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**MONMN-20200220**					
Laboratory ID:	02-200-06					
Hardness	**64**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**MONMS-20200220**					
Laboratory ID:	02-200-07					
Hardness	**110**	5.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	

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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-20200220**					
Laboratory ID:	02-200-08					
Hardness	**76**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**SEIMN-20200220**					
Laboratory ID:	02-200-09					
Hardness	**19**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**SEIMS-20200220**					
Laboratory ID:	02-200-10					
Hardness	**35**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**TOSMI-20200220**					
Laboratory ID:	02-200-11					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**TOSMO-20200220**					
Laboratory ID:	02-200-12					
Hardness	**100**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**TYLMI-20200220**					
Laboratory ID:	02-200-13					
Hardness	**80**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**TYLMO-20200220**					
Laboratory ID:	02-200-14					
Hardness	**72**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	

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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:	**QA81-20200220**					
Laboratory ID:	02-200-15					
Hardness	**35**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	
Client ID:	**QA83-20200220**					
Laboratory ID:	02-200-17					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	

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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:	MB0227WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	2-27-20	2-27-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-200-02										
	ORIG	DUP									
Hardness	**115**	**115**	NA		NA	NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	02-200-02										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**240**	**243**	132	132	115	95	97	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0227WH1										
	SB		SB			SB					
Hardness	**126**		132		NA	95		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-20200220**					
Laboratory ID:	02-200-01					
Dissolved Organic Carbon	**9.4**	1.0	SM 5310B	2-27-20	2-27-20	
Client ID:	**COUMI-20200220**					
Laboratory ID:	02-200-02					
Dissolved Organic Carbon	**3.2**	1.0	SM 5310B	2-27-20	2-27-20	
Client ID:	**COUMO-20200220**					
Laboratory ID:	02-200-03					
Dissolved Organic Carbon	**3.6**	1.0	SM 5310B	2-27-20	2-27-20	
Client ID:	**EVAMS-20200220**					
Laboratory ID:	02-200-04					
Dissolved Organic Carbon	**3.3**	1.0	SM 5310B	2-27-20	2-27-20	
Client ID:	**EVALSS-20200220**					
Laboratory ID:	02-200-05					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	2-27-20	2-27-20	
Client ID:	**MONMN-20200220**					
Laboratory ID:	02-200-06					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**MONMS-20200220**					
Laboratory ID:	02-200-07					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	3-12-20	3-12-20	

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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-20200220**					
Laboratory ID:	02-200-08					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**SEIMN-20200220**					
Laboratory ID:	02-200-09					
Dissolved Organic Carbon	**6.2**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**SEIMS-20200220**					
Laboratory ID:	02-200-10					
Dissolved Organic Carbon	**3.6**	1.0	SM 5310B	2-27-20	2-27-20	
Client ID:	**TOSMI-20200220**					
Laboratory ID:	02-200-11					
Dissolved Organic Carbon	**3.4**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**TOSMO-20200220**					
Laboratory ID:	02-200-12					
Dissolved Organic Carbon	**3.2**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**TYLMI-20200220**					
Laboratory ID:	02-200-13					
Dissolved Organic Carbon	**4.5**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**TYLMO-20200220**					
Laboratory ID:	02-200-14					
Dissolved Organic Carbon	**3.9**	1.0	SM 5310B	3-12-20	3-12-20	

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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:	**QA81-20200220**					
Laboratory ID:	02-200-15					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**QA82-20200220**					
Laboratory ID:	02-200-16					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	3-12-20	3-12-20	
Client ID:	**QA83-20200220**					
Laboratory ID:	02-200-17					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	3-12-20	3-12-20	

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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:	MB0227D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	2-27-20	2-27-20	
Laboratory ID:	MB0312D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	3-12-20	3-12-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-200-10								
	ORIG	DUP							
Dissolved Organic Carbon	**3.60**	**3.73**	NA	NA	NA	NA	4	15	
MATRIX SPIKE									
Laboratory ID:	02-200-10								
	MS		MS		MS				
Dissolved Organic Carbon	**13.7**		10.0	3.60	101	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0227D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.90**		10.0	NA	99	87-122	NA	NA	
DUPLICATE									
Laboratory ID:	03-016-01								
	ORIG	DUP							
Dissolved Organic Carbon	**ND**	**ND**	NA	NA	NA	NA	NA	15	
MATRIX SPIKE									
Laboratory ID:	03-016-01								
	MS		MS		MS				
Dissolved Organic Carbon	**10.7**		10.0	ND	107	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0312D1								
	SB		SB		SB				
Dissolved Organic Carbon	**9.68**		10.0	NA	97	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-20200220**					
Laboratory ID:	02-200-01					
Total Phosphorus	**ND**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**COUMI-20200220**					
Laboratory ID:	02-200-02					
Total Phosphorus	**0.056**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**COUMO-20200220**					
Laboratory ID:	02-200-03					
Total Phosphorus	**0.041**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**EVAMS-20200220**					
Laboratory ID:	02-200-04					
Total Phosphorus	**0.021**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**EVALSS-20200220**					
Laboratory ID:	02-200-05					
Total Phosphorus	**0.028**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**MONMN-20200220**					
Laboratory ID:	02-200-06					
Total Phosphorus	**0.027**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**MONMS-20200220**					
Laboratory ID:	02-200-07					
Total Phosphorus	**0.025**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**MONM-20200220**					
Laboratory ID:	02-200-08					
Total Phosphorus	**0.039**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**SEIMN-20200220**					
Laboratory ID:	02-200-09					
Total Phosphorus	**0.025**	0.010	EPA 365.1	2-25-20	2-26-20	

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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:	**SEIMS-20200220**					
Laboratory ID:	02-200-10					
Total Phosphorus	**0.029**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**TOSMI-20200220**					
Laboratory ID:	02-200-11					
Total Phosphorus	**0.067**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**TOSMO-20200220**					
Laboratory ID:	02-200-12					
Total Phosphorus	**0.052**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**TYLMI-20200220**					
Laboratory ID:	02-200-13					
Total Phosphorus	**0.045**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**TYLMO-20200220**					
Laboratory ID:	02-200-14					
Total Phosphorus	**0.028**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**QA81-20200220**					
Laboratory ID:	02-200-15					
Total Phosphorus	**0.026**	0.010	EPA 365.1	2-25-20	2-26-20	
Client ID:	**QA83-20200220**					
Laboratory ID:	02-200-17					
Total Phosphorus	**ND**	0.010	EPA 365.1	2-25-20	2-26-20	

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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:	MB0225W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	2-25-20	2-26-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	02-200-01								
	ORIG	DUP							
Total Phosphorus	**ND**	**ND**	NA	NA	NA	NA	NA	14	
MATRIX SPIKE									
Laboratory ID:	02-200-01								
	MS		MS		MS				
Total Phosphorus	**0.239**		0.250	ND	96	79-113	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0225W1								
	SB		SB		SB				
Total Phosphorus	**0.243**		0.250	NA	97	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-20200220**					
Laboratory ID:	02-200-01					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**COUMI-20200220**					
Laboratory ID:	02-200-02					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**5.4**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**COUMO-20200220**					
Laboratory ID:	02-200-03					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**12**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**EVAMS-20200220**					
Laboratory ID:	02-200-04					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**EVALSS-20200220**					
Laboratory ID:	02-200-05					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**MONMN-20200220**					
Laboratory ID:	02-200-06					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**MONMS-20200220**					
Laboratory ID:	02-200-07					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	

Date of Report: March 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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-20200220**					
Laboratory ID:	02-200-08					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**9.1**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**SEIMN-20200220**					
Laboratory ID:	02-200-09					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**SEIMS-20200220**					
Laboratory ID:	02-200-10					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**TOSMI-20200220**					
Laboratory ID:	02-200-11					
Copper	**1.9**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**37**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**TOSMO-20200220**					
Laboratory ID:	02-200-12					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**14**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**TYLMI-20200220**					
Laboratory ID:	02-200-13					
Copper	**3.0**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**16**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**TYLMO-20200220**					
Laboratory ID:	02-200-14					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**8.0**	5.0	EPA 200.8	2-26-20	2-28-20	

Date of Report: March 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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:	**QA81-20200220**					
Laboratory ID:	02-200-15					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	
Client ID:	**QA83-20200220**					
Laboratory ID:	02-200-17					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	

Date of Report: March 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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:	MB0226WH2					
Copper	**ND**	1.0	EPA 200.8	2-26-20	2-28-20	
Zinc	**ND**	5.0	EPA 200.8	2-26-20	2-28-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-200-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	02-200-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**95.2**	**95.6**	100	100	ND	**95**	**96**	75-125	0	20	
Zinc	**103**	**104**	100	100	ND	**103**	**104**	75-125	1	20	

Date of Report: March 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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-20200220**					
Laboratory ID:	02-200-01					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**COUMI-20200220**					
Laboratory ID:	02-200-02					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**COUMO-20200220**					
Laboratory ID:	02-200-03					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**9.7**	5.0	EPA 200.8		2-28-20	
Client ID:	**EVAMS-20200220**					
Laboratory ID:	02-200-04					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**EVALSS-20200220**					
Laboratory ID:	02-200-05					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**MONMN-20200220**					
Laboratory ID:	02-200-06					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**MONMS-20200220**					
Laboratory ID:	02-200-07					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	

Date of Report: March 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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-20200220**					
Laboratory ID:	02-200-08					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**8.0**	5.0	EPA 200.8		2-28-20	
Client ID:	**SEIMN-20200220**					
Laboratory ID:	02-200-09					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**SEIMS-20200220**					
Laboratory ID:	02-200-10					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**TOSMI-20200220**					
Laboratory ID:	02-200-11					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**21**	5.0	EPA 200.8		2-28-20	
Client ID:	**TOSMO-20200220**					
Laboratory ID:	02-200-12					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**12**	5.0	EPA 200.8		2-28-20	
Client ID:	**TYLMI-20200220**					
Laboratory ID:	02-200-13					
Copper	**1.0**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**TYLMO-20200220**					
Laboratory ID:	02-200-14					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**5.7**	5.0	EPA 200.8		2-28-20	

Date of Report: March 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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:	**QA81-20200220**					
Laboratory ID:	02-200-15					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**QA82-20200220**					
Laboratory ID:	02-200-16					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	
Client ID:	**QA83-20200220**					
Laboratory ID:	02-200-17					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	

Date of Report: March 17, 2020
Samples Submitted: February 20, 2020
Laboratory Reference: 2002-200
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:	MB0228D1					
Copper	**ND**	1.0	EPA 200.8		2-28-20	
Zinc	**ND**	5.0	EPA 200.8		2-28-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-200-17										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	02-200-17										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**77.6**	**76.6**	80.0	80.0	ND	**97**	**96**	75-125	1	20	
Zinc	**80.4**	**79.8**	80.0	80.0	ND	**101**	**100**	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 3 2020
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-20200220	Water	20-A002508	Micro, NUT
COUMI-20200220	Water	20-A002509	Micro, NUT
COUMO-20200220	Water	20-A002510	Micro, NUT
EVAMS-20200220	Water	20-A002511	Micro, NUT
EVALSS-20200220	Water	20-A002512	Micro, NUT
MONMN-20200220	Water	20-A002513	Micro, NUT
MONMS-20200220	Water	20-A002514	Micro, NUT
MONM-20200220	Water	20-A002515	Micro, NUT
SEIMN-20200220	Water	20-A002516	Micro, NUT
SEIMS-20200220	Water	20-A002517	Micro, NUT
TOSMI-20200220	Water	20-A002518	Micro, NUT
TOSMO-20200220	Water	20-A002519	Micro, NUT
TYLMI-20200220	Water	20-A002520	Micro, NUT
TYLMO-20200220	Water	20-A002521	Micro, NUT
QA81-20200220	Water	20-A002522	Micro, NUT
QA83-20200220	Water	20-A002523	Micro, NUT

Your samples were received on Thursday, February 20, 2020. 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 3 2020
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: 02-200

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: 02-200
All results reported on an as received basis.

Date Received: 02/20/20
Date Reported: 3/ 3/20

AMTEST Identification Number **20-A002508**
Client Identification **COLM-20200220**
Sampling Date **02/20/20, 11:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.52	mg/l		0.1			
Total Nitrogen (TKN)	0.475	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.043	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002509**
Client Identification **COUMI-20200220**
Sampling Date **02/20/20, 10:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.59	mg/l		0.1			
Total Nitrogen (TKN)	0.309	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002510**
Client Identification **COUMO-20200220**
Sampling Date **02/20/20, 10:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.73	mg/l		0.1			
Total Nitrogen (TKN)	0.311	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.42	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002511**
Client Identification **EVAMS-20200220**
Sampling Date **02/20/20, 13:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	2.44	mg/l		0.1			
Total Nitrogen (TKN)	0.438	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	2.0	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002512**
Client Identification **EVALSS-20200220**
Sampling Date **02/20/20, 13:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	2.01	mg/l		0.1			
Total Nitrogen (TKN)	0.312	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	1.7	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002513**
Client Identification **MONMN-20200220**
Sampling Date **02/20/20, 11:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	58.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.51	mg/l		0.1			
Total Nitrogen (TKN)	0.399	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.11	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002514**
Client Identification **MONMS-20200220**
Sampling Date **02/20/20, 11:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.418	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.53	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002515**
Client Identification **MONM-20200220**
Sampling Date **02/20/20, 12:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.81	mg/l		0.1			
Total Nitrogen (TKN)	0.408	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.40	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002516**
Client Identification **SEIMN-20200220**
Sampling Date **02/20/20, 10:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.50	mg/l		0.1			
Total Nitrogen (TKN)	0.368	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.13	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002517**
Client Identification **SEIMS-20200220**
Sampling Date **02/20/20, 12:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.53	mg/l		0.1			
Total Nitrogen (TKN)	0.314	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.22	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002518**
Client Identification **TOSMI-20200220**
Sampling Date **02/20/20, 12:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	8.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	1.07	mg/l		0.1			
Total Nitrogen (TKN)	0.380	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.69	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002519**
Client Identification **TOSMO-20200220**
Sampling Date **02/20/20, 10:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	8.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.86	mg/l		0.1			
Total Nitrogen (TKN)	0.327	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.53	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002520**
Client Identification **TYLMI-20200220**
Sampling Date **02/20/20, 11:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	10.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	1.11	mg/l		0.1			
Total Nitrogen (TKN)	0.466	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.64	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002521**
Client Identification **TYLMO-20200220**
Sampling Date **02/20/20, 10:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4.	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	1.15	mg/l		0.1			
Total Nitrogen (TKN)	0.373	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.78	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002522**
Client Identification **QA81-20200220**
Sampling Date **02/20/20, 12:10**

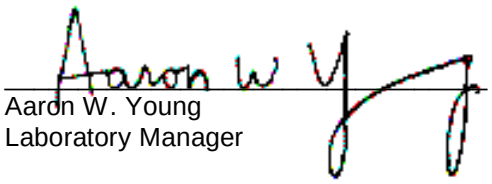
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.54	mg/l		0.1			
Total Nitrogen (TKN)	0.350	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	0.19	mg/l		0.02	SM4500NO3	SH	02/26/20

AMTEST Identification Number **20-A002523**
Client Identification **QA83-20200220**
Sampling Date **02/20/20, 10:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	< 2	CFU/100 ml		2	SM 9222D	JM	02/20/20
Total Nitrogen (NOX&TKN)	0.26	mg/l		0.1			
Total Nitrogen (TKN)	0.257	mg/l		0.2	SM4500N	SH	03/02/20
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	SH	02/26/20



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: 20-A002508 to 20-A002523

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A002509	Fecal coliform	CFU/100 ml	2.	2.	0.00
20-A002521	Fecal coliform	CFU/100 ml	4.	2.	67.
20-A002524	Fecal coliform	CFU/100 ml	4.	2.	67.
20-A002535	Fecal coliform	CFU/100 ml	< 2	< 2	
20-A002508	Total Nitrogen (TKN)	mg/l	0.475	0.464	2.3
20-A002518	Total Nitrogen (TKN)	mg/l	0.380	0.384	1.0
20-A002550	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
20-A002940	Total Nitrogen (TKN)	mg/l	0.348	0.338	2.9
20-A002516	Total Nitrate + Nitrite	mg/l	0.13	0.14	7.4
20-A002536	Total Nitrate + Nitrite	mg/l	0.74	0.69	7.0
20-A002832	Total Nitrate + Nitrite	mg/l	1.7	1.7	0.00
20-A002842	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A002508	Total Nitrogen (TKN)	mg/l	0.475	2.43	2.00	97.75 %
20-A002518	Total Nitrogen (TKN)	mg/l	0.380	2.34	2.00	98.00 %
20-A002550	Total Nitrogen (TKN)	mg/l	< 0.2	2.13	2.00	106.50 %
20-A002940	Total Nitrogen (TKN)	mg/l	0.348	2.35	2.00	100.10 %
20-A002516	Total Nitrate + Nitrite	mg/l	0.13	1.1	1.0	97.00 %
20-A002536	Total Nitrate + Nitrite	mg/l	0.74	1.7	1.0	96.00 %
20-A002832	Total Nitrate + Nitrite	mg/l	1.7	2.6	1.0	90.00 %
20-A002842	Total Nitrate + Nitrite	mg/l	< 0.02	0.91	1.0	91.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.00	100. %
Total Nitrogen (TKN)	mg/l	1.00	0.984	98.4 %
Total Nitrate + Nitrite	mg/l	1.0	0.90	90.0 %
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	0.96	96.0 %

BLANKS

ANALYTE	UNITS	RESULT
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1
Fecal coliform	CFU/100 ml	< 1

QC Summary for sample numbers: 20-A002508 to 20-A002523...

BLANKS continued....

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

OnSite Environmental Inc.

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

Laboratory Reference #: 02-200

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-20200220 2508	2/20/20	11:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200220 09	2/20/20	10:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200220 10	2/20/20	10:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200220 11	2/20/20	13:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200220 12	2/20/20	13:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200220 13	2/20/20	11:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200220 14	2/20/20	11:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200220 15	2/20/20	12:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200220 16	2/20/20	10:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200220 17	2/20/20	12:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	2/20/20	3:10 pm	
Received by:	AMTEST T=5.3	2/20/20	3:10	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 #: 02-200

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-20200220 2518	2/20/20	12:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200220 19	2/20/20	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200220 20	2/20/20	11:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200220 21	2/20/20	10:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA81-20200220 22	2/20/20	12:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
17	QA83-20200220 23	2/20/20	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	2/20/20	3:10	
Received by:	AMTEST T=5.3	2/20/20	3:10	**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

02-200

Page 1 of 2

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.

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-2020 0220	2/20/20	1030	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020 0220		1010	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020 0220		1000	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020 0220		1300	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020 0220		1315	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020 0220		1125	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020 0220		1135	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020 0220		1235	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020 0220		1045	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020 0220		1205	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020 0220		1235	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020 0220		1020	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020 0220		1100	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020 0220		1040	Water	7	X	X	X	X	X	X	X	X	X			
15	QA82-20200220		1210	Water	7	X	X	X	X	X	X	X	X	X			
16	QA82-20200220	↓	1010	Water	2				X				~~X~~	X			

Relinquished by [signature] Date 2/20/20 Received by Nicole Bellin Date 2/20/20

Firm Herrera Time 1335 Firm QSE Time 13:35

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

02-200

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.

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-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~COUMI-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~COUMO-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~EVAMS-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~EVALSS-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~MONMN-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~MONMS-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~MONM-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~SEIMN-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~SEIMS-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~TOSMI-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~TOSMO-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~TYLMI-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~TYLMO-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
17	QA83-20200220	2/20/20	1020	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 2/20/20 Received by _____ Date 2/20/20

Firm Herrera Time 1335 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

02-200

Page 1 of 2

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.

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-2020	2/20/20	1130	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2020		1010	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2020		1000	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2020		1300	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2020		1315	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2020		1125	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2020		1135	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2020		1235	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2020		1045	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2020		1205	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2020		1235	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2020		1020	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2020		1100	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2020		1040	Water	7	X	X	X	X	X	X	X	X	X			
	QA82-20200220		1210	Water	7	X	X	X	X	X	X	X	X	X			
	QA82-20200220		1010	Water	2								X	X			

Relinquished by [signature] Date 2/20/20 Received by [signature] Date 2/20/20

Firm Herrera Time 1335 Firm ASE Time 13:35

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:	N. Burtch
Meter:	ProDSS #1
Date/Time:	02/19/20 12:30
Barometric Pressure Start of Day:	mmHg: 772.0 Time: 12:30
Barometric Pressure End of Day:	mmHg: 771.6 Time: 13:00

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.3 ~~1.9~~	0	20.3	
Conductivity (µS/cm)	1002	1,000	21.6	
Conductivity (µS/cm)	101.3	100	21.6	
DO % Saturation	100.8	100	20.3	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	20.3	
Conductivity (µS/cm)	98.7	100	20.2	
DO % Saturation	101.8 ~~Test~~ KB	100	16.8	

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:	N. Bartish
Meter:	ProDSS #2
Date/Time:	02/19/20 12:30
Barometric Pressure Start of Day:	mmHg: 772.9 Time: 12:30
Barometric Pressure End of Day:	mmHg: 771.8 Time: 13:00

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	21.0	
Conductivity (µS/cm)	999	1,000	20.8	
Conductivity (µS/cm)	102.5	100	20.9	
DO % Saturation	100.8	100	21.1	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.8	0	21.2	
Conductivity (µS/cm)	99.3	100	21.4	
DO % Saturation	101.4	100	17.8	

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.

CHAIN OF CUSTODY 02-200

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.

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-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~COUMI-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~COUMO-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~EVAMS-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~EVALSS-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~MONMN-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~MONMS-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~MONM-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~SEIMN-2020~~			Water	7	X	X	X	X	X	X	X	X	X			
	~~SEIMS-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~TOSMI-2020~~			~~Water~~	~~7~~	X	X	X	X	X	X	X	X	X			
	~~TOSMO-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~TYLMI-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	~~TYLMO-2020~~			~~Water~~	7	X	X	X	X	X	X	X	X	X			
	QA83 - 20200220	2/20/20	1020	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date 2/20/20 Received by _____ Date 2/20/20

Firm Herrera Time 1335 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

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL/ICB

Sample Date: 20200220 **Sample Time:** 1130 / 1020 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1135 / 1010 PST: X

(Must filter within 15 minutes of collection)

SITE ID: COLM-20200220

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: SUNNY MID 30S

Water Quality Sampling

Sample ID: COLM-20200220

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: QA82-20200220

Transfer blank sample ID: QA83-20200220

Visual and Olfactory Conditions:

Clarity: Clear

Color: light brown / tannin

Odor: N/A

Sheen: N/A

Floatables: some foam up & downstream

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 5.67

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.2

Specific Conductivity (µs/cm) 31.1

Dissolved Oxygen (mg/L) 12.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1010 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1015 PST: X

(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:

Water Quality Sampling

Sample ID: COUMI-20200220

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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.95

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 4.7

Specific Conductivity (µs/cm) 262.5

Dissolved Oxygen (mg/L) 12.79

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1000 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1005 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: Sunny, 40 °F

Water Quality Sampling

Sample ID: COUMO-20200220

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:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 1.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.2

Specific Conductivity (µs/cm) 176.9

Dissolved Oxygen (mg/L) 12.65

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: FB/NL

Sample Date: 20200220 **Sample Time:** 1300 PDT: PST: X

SITE ID: EVAMS-20200220

Base Flow or Storm Event? (Base)

Field Filtered Time: 1305 (Must filter within 15 minutes of collection)

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: SUNNY, 50s

Water Quality Sampling

Sample ID: EVAMS-20200220

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:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 (circled)

Stream Stage Measurement

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

Stream Stage (ft): 2.82

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 7.0

Specific Conductivity (µs/cm) 189.8

Dissolved Oxygen (mg/L) 12.03

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NL KB

Sample Date: 20200220 **Sample Time:** 1315 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1320 PST: X

(Must filter within 15 minutes of collection)

SITE ID: EVALSS - 20200220

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: SUNNY, 50s

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: clear

Odor: N/A

Sheen: N/A

Floatables: N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.33

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 176.6

Dissolved Oxygen (mg/L) 12.40

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1125 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1130
(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 50°F

Water Quality Sampling

Sample ID: MONMN-20200220

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:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 9.22

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.5

Specific Conductivity (µs/cm) 1668

Dissolved Oxygen (mg/L) 12.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1135 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1140
(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, 50°F

Water Quality Sampling

Sample ID: MONMS-20200220

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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 6.879n

Reference Point (description): top of pipe

Water Quality Measurments

Temperature (°C) 5.1

Specific Conductivity (µs/cm) 264.1

Dissolved Oxygen (mg/L) 11.2

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1235 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1240

(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 - 20200220

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): –

Reference Point (description): –

Water Quality Measurments

Temperature (°C) 5.0

Specific Conductivity (µs/cm) 200.0

Dissolved Oxygen (mg/L) 12.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NLI KB

Sample Date: 20200220 **Sample Time:** 1045 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1050 PST: X

(Must filter within 15 minutes of collection)

SITE ID: SEIMN-20200220

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: SUNNY MID 30S

Water Quality Sampling

Sample ID: SEIMN-20200220

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 / tannins

Odor: N/A

Sheen: N/A

Floatables: foam downstream mostly from weir

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.58 *

Reference Point (description): top of bolt from ∧

* Channel degraded + shifted to right well/gauging station no longer in channel. See photographs.

Water Quality Measurments

Temperature (°C) 5.3

Specific Conductivity (µs/cm) 53.3

Dissolved Oxygen (mg/L) 12.65

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Barthsh

Sample Date: 2/20/20 **Sample Time:** 1205/1210 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1210/1215

(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, 50F

Water Quality Sampling

Sample ID: SEIMS-20200220

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:	QA81-20200220
Filter blank sample ID:	—
Transfer blank sample ID:	—

Visual and Olfactory Conditions:

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

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.79 * water below SG

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 5.Ce

Specific Conductivity (µs/cm) 90.6

Dissolved Oxygen (mg/L) 12.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: KB/NL

Sample Date: 20200220 **Sample Time:** 1235 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1240 PST: X

(Must filter within 15 minutes of collection)

SITE ID: TOSM1-20200220

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: SUNNY, 52°

Water Quality Sampling

Sample ID: TOSM1-20200220

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:	N/A
Sheen:	N/A
Floatables:	N/A

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.80

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 262.0

Dissolved Oxygen (mg/L) 12.18

pH was 7.65; SPC is also high.

KB + NM observed ~~what appeared to be~~ (KB will finish)

* NM checked SPC, data are within normal range *

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1020 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1025
(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, 45°F

Water Quality Sampling

Sample ID: TOSMO-20200220

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:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): SG

Water Quality Measurments

Temperature (°C) 4.6

Specific Conductivity (µs/cm) 238.1

Dissolved Oxygen (mg/L) 13.06

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1100 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1105
(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: sunny, 50°F

Water Quality Sampling

Sample ID: TYLMI-20200220

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, some particulates
Color:	none
Odor:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 4ft 5in

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 5.5

Specific Conductivity (µs/cm) 184.3

Dissolved Oxygen (mg/L) 12.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N Maas, N. Bartish

Sample Date: 2/20/20 **Sample Time:** 1040 PDT: PST: X

Base Flow or Storm Event? **Field Filtered Time:** 1045

(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: sunny, 45°F

Water Quality Sampling

Sample ID: TYLMO-20200220

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:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2ft 10in

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 4.6

Specific Conductivity (µs/cm) 177.8

Dissolved Oxygen (mg/L) 13.01

Data Quality Assurance Worksheet

By J. Brown

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

Date 4/6/20 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: 2/20/20 /All locations, QA81 (SEIMS dupe), QA82 (filter blank - OK), QA83 (transfer blank - OK) Lab Ref No 2002-200

date 4/30/2020

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**	104	**±20**	D=0.40	**≤ 25**	D=0	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	11	**≤ 25**	20	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	7	**≤180**	≤1.0 mg/L 1.0 mg/L	95, 97	**±25**	95	**±15**	0 MS 1	**≤ 20**	0	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	7, 21	**≤28**	≤1.0 mg/L 1.0 mg/L	101, 107	**±25**	99, 97	**±15**	D=0.13, NC	**≤ 20**	D=0.2	**≤ 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**	NC	**≤ 20**	D=0	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	6, 11	**≤28**	≤0.1 mg/L 0.1 mg/L	90-107	**±25**	90-100	**±20**	D=0.004-0.05, NC	**≤ 20**	D=0.03, D=0.04	**≤ 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 4/6/20 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: 2/20/20 /All locations, QA81 (SEIMS dupe), QA82 (filter blank - OK), QA83 (transfer blank - OK) Lab Ref No 2002-200

date 4/30/2020

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**	8	**≤180**	≤1.0 µg/L 1.0 µg/L	95, 96	**±25**	NR	**±15**	NC, MS 0	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	8	**≤180**	≤5.0 µg/L 5.0 µg/L	103, 104	**±25**	NR	**±15**	NC, MS 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤1.0 µg/L 1.0 µg/L	97, 96	**±25**	NR	**±15**	NC, MS 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤5.0 µg/L 5.0 µg/L	101, 100	**±25**	NR	**±15**	NC, MS 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**		**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	D=1-2	**≤ 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; NR – not reported

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

May 5, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2004-152

Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on April 22, 2020.

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 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
Project: 14-05806-000

Case Narrative

Samples were collected on April 22, 2020 and received by the laboratory on April 22, 2020. 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 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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-20200422**					
Laboratory ID:	04-152-01					
Total Suspended Solids	**14**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**COUMI-20200422**					
Laboratory ID:	04-152-02					
Total Suspended Solids	**79**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**COUMO-20200422**					
Laboratory ID:	04-152-03					
Total Suspended Solids	**32**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**EVAMS-20200422**					
Laboratory ID:	04-152-04					
Total Suspended Solids	**30**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**EVALSS-20200422**					
Laboratory ID:	04-152-05					
Total Suspended Solids	**62**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**MONMN-20200422**					
Laboratory ID:	04-152-06					
Total Suspended Solids	**46**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**MONMS-20200422**					
Laboratory ID:	04-152-07					
Total Suspended Solids	**9.6**	0.80	SM 2540D	4-23-20	4-24-20	
Client ID:	**MONM-20200422**					
Laboratory ID:	04-152-08					
Total Suspended Solids	**34**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**SEIMN-20200422**					
Laboratory ID:	04-152-09					
Total Suspended Solids	**20**	0.80	SM 2540D	4-23-20	4-24-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**SEIMS-20200422**					
Laboratory ID:	04-152-10					
Total Suspended Solids	**65**	4.0	SM 2540D	4-23-20	4-24-20	
Client ID:	**TOSMI-20200422**					
Laboratory ID:	04-152-11					
Total Suspended Solids	**51**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**TOSMO-20200422**					
Laboratory ID:	04-152-12					
Total Suspended Solids	**88**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**TYLMI-20200422**					
Laboratory ID:	04-152-13					
Total Suspended Solids	**24**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**TYLMO-20200422**					
Laboratory ID:	04-152-14					
Total Suspended Solids	**53**	1.6	SM 2540D	4-23-20	4-24-20	
Client ID:	**QA85-20200422**					
Laboratory ID:	04-152-15					
Total Suspended Solids	**61**	1.6	SM 2540D	4-23-20	4-24-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	MB0424W2					
Total Suspended Solids	**ND**	4.0	SM 2540D	4-23-20	4-24-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	04-152-03								
	ORIG	DUP							
Total Suspended Solids	**32.4**	**40.8**	NA	NA	NA	NA	23	23	
SPIKE BLANK									
Laboratory ID:	SB0424W2								
	SB		SB		SB				
Total Suspended Solids	**104**		100	NA	104	69-122	NA	NA	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20200422**					
Laboratory ID:	04-152-01					
Turbidity	**3.4**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**COUMI-20200422**					
Laboratory ID:	04-152-02					
Turbidity	**36**	0.20	EPA 180.1	4-23-20	4-23-20	
Client ID:	**COUMO-20200422**					
Laboratory ID:	04-152-03					
Turbidity	**18**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**EVAMS-20200422**					
Laboratory ID:	04-152-04					
Turbidity	**12**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**EVALSS-20200422**					
Laboratory ID:	04-152-05					
Turbidity	**25**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**MONMN-20200422**					
Laboratory ID:	04-152-06					
Turbidity	**24**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**MONMS-20200422**					
Laboratory ID:	04-152-07					
Turbidity	**6.1**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**MONM-20200422**					
Laboratory ID:	04-152-08					
Turbidity	**13**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**SEIMN-20200422**					
Laboratory ID:	04-152-09					
Turbidity	**9.0**	0.10	EPA 180.1	4-23-20	4-23-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200422**					
Laboratory ID:	04-152-10					
Turbidity	**32**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**TOSMI-20200422**					
Laboratory ID:	04-152-11					
Turbidity	**16**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**TOSMO-20200422**					
Laboratory ID:	04-152-12					
Turbidity	**45**	0.20	EPA 180.1	4-23-20	4-23-20	
Client ID:	**TYLMI-20200422**					
Laboratory ID:	04-152-13					
Turbidity	**8.4**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**TYLMO-20200422**					
Laboratory ID:	04-152-14					
Turbidity	**28**	0.10	EPA 180.1	4-23-20	4-23-20	
Client ID:	**QA85-20200422**					
Laboratory ID:	04-152-15					
Turbidity	**22**	0.10	EPA 180.1	4-23-20	4-23-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	MB0423W1					
Turbidity	**ND**	0.10	EPA 180.1	4-23-20	4-23-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	04-151-01								
	ORIG	DUP							
Turbidity	**8.10**	**7.92**	NA	NA	NA	NA	2	15	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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-20200422**					
Laboratory ID:	04-152-01					
Hardness	**13**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**COUMI-20200422**					
Laboratory ID:	04-152-02					
Hardness	**90**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**COUMO-20200422**					
Laboratory ID:	04-152-03					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**EVAMS-20200422**					
Laboratory ID:	04-152-04					
Hardness	**88**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**EVALSS-20200422**					
Laboratory ID:	04-152-05					
Hardness	**85**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**MONMN-20200422**					
Laboratory ID:	04-152-06					
Hardness	**77**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**MONMS-20200422**					
Laboratory ID:	04-152-07					
Hardness	**78**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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-20200422**					
Laboratory ID:	04-152-08					
Hardness	**77**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**SEIMN-20200422**					
Laboratory ID:	04-152-09					
Hardness	**29**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**SEIMS-20200422**					
Laboratory ID:	04-152-10					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**TOSMI-20200422**					
Laboratory ID:	04-152-11					
Hardness	**28**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**TOSMO-20200422**					
Laboratory ID:	04-152-12					
Hardness	**50**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**TYLMI-20200422**					
Laboratory ID:	04-152-13					
Hardness	**51**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**TYLMO-20200422**					
Laboratory ID:	04-152-14					
Hardness	**32**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	
Client ID:	**QA85-20200422**					
Laboratory ID:	04-152-15					
Hardness	**28**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	MB0427WH3					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	4-27-20	4-28-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	04-152-01										
	ORIG	DUP									
Hardness	**13.4**	**13.5**	NA		NA	NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	04-152-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**143**	**143**	132	132	13.4	98	98	75-125	0	20	
SPIKE BLANK											
Laboratory ID:	SB0427WH3										
	SB		SB			SB					
Hardness	**136**		132		NA	103		85-115	NA	NA	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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-20200422**					
Laboratory ID:	04-152-01					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**COUMI-20200422**					
Laboratory ID:	04-152-02					
Dissolved Organic Carbon	**7.9**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**COUMO-20200422**					
Laboratory ID:	04-152-03					
Dissolved Organic Carbon	**9.6**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**EVAMS-20200422**					
Laboratory ID:	04-152-04					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**EVALSS-20200422**					
Laboratory ID:	04-152-05					
Dissolved Organic Carbon	**4.2**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**MONMN-20200422**					
Laboratory ID:	04-152-06					
Dissolved Organic Carbon	**7.5**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**MONMS-20200422**					
Laboratory ID:	04-152-07					
Dissolved Organic Carbon	**8.7**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**MONM-20200422**					
Laboratory ID:	04-152-08					
Dissolved Organic Carbon	**7.2**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**SEIMN-20200422**					
Laboratory ID:	04-152-09					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	4-30-20	4-30-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**SEIMS-20200422**					
Laboratory ID:	04-152-10					
Dissolved Organic Carbon	**9.1**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**TOSMI-20200422**					
Laboratory ID:	04-152-11					
Dissolved Organic Carbon	**9.6**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**TOSMO-20200422**					
Laboratory ID:	04-152-12					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**TYLMI-20200422**					
Laboratory ID:	04-152-13					
Dissolved Organic Carbon	**12**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**TYLMO-20200422**					
Laboratory ID:	04-152-14					
Dissolved Organic Carbon	**8.6**	1.0	SM 5310B	4-30-20	4-30-20	
Client ID:	**QA85-20200422**					
Laboratory ID:	04-152-15					
Dissolved Organic Carbon	**9.4**	1.0	SM 5310B	4-30-20	4-30-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	MB0430D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	4-30-20	4-30-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	04-152-01								
	ORIG	DUP							
Dissolved Organic Carbon	**12.9**	**12.9**	NA	NA	NA	NA	0	15	
MATRIX SPIKE									
Laboratory ID:	04-152-01								
	MS		MS		MS				
Dissolved Organic Carbon	**22.4**		10.0	12.9	95	77-126	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0430D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.3**		10.0	NA	103	87-122	NA	NA	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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-20200422**					
Laboratory ID:	04-152-01					
Total Phosphorus	**0.031**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**COUMI-20200422**					
Laboratory ID:	04-152-02					
Total Phosphorus	**0.18**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**COUMO-20200422**					
Laboratory ID:	04-152-03					
Total Phosphorus	**0.13**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**EVAMS-20200422**					
Laboratory ID:	04-152-04					
Total Phosphorus	**0.067**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**EVALSS-20200422**					
Laboratory ID:	04-152-05					
Total Phosphorus	**0.11**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**MONMN-20200422**					
Laboratory ID:	04-152-06					
Total Phosphorus	**0.12**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**MONMS-20200422**					
Laboratory ID:	04-152-07					
Total Phosphorus	**0.069**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**MONM-20200422**					
Laboratory ID:	04-152-08					
Total Phosphorus	**0.099**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**SEIMN-20200422**					
Laboratory ID:	04-152-09					
Total Phosphorus	**0.068**	0.010	EPA 365.1	4-23-20	4-29-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**SEIMS-20200422**					
Laboratory ID:	04-152-10					
Total Phosphorus	**0.13**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**TOSMI-20200422**					
Laboratory ID:	04-152-11					
Total Phosphorus	**0.13**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**TOSMO-20200422**					
Laboratory ID:	04-152-12					
Total Phosphorus	**0.22**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**TYLMI-20200422**					
Laboratory ID:	04-152-13					
Total Phosphorus	**0.093**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**TYLMO-20200422**					
Laboratory ID:	04-152-14					
Total Phosphorus	**0.12**	0.010	EPA 365.1	4-23-20	4-29-20	
Client ID:	**QA85-20200422**					
Laboratory ID:	04-152-15					
Total Phosphorus	**0.16**	0.010	EPA 365.1	4-23-20	4-29-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	MB0423W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	4-23-20	4-29-20	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	04-132-01							
	ORIG DUP							
Total Phosphorus	**ND** **ND**	NA	NA	NA	NA	NA	14	
MATRIX SPIKE								
Laboratory ID:	04-132-01							
	MS	MS		MS				
Total Phosphorus	**0.247**	0.250	ND	99	79-113	NA	NA	
SPIKE BLANK								
Laboratory ID:	SB0423W1							
	SB	SB		SB				
Total Phosphorus	**0.234**	0.250	NA	94	78-113	NA	NA	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**COLM-20200422**					
Laboratory ID:	04-152-01					
Copper	**ND**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**ND**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**COUMI-20200422**					
Laboratory ID:	04-152-02					
Copper	**8.7**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**25**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**COUMO-20200422**					
Laboratory ID:	04-152-03					
Copper	**8.8**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**44**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**EVAMS-20200422**					
Laboratory ID:	04-152-04					
Copper	**1.6**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**7.8**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**EVALSS-20200422**					
Laboratory ID:	04-152-05					
Copper	**2.0**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**7.1**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**MONMN-20200422**					
Laboratory ID:	04-152-06					
Copper	**2.1**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**18**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**MONMS-20200422**					
Laboratory ID:	04-152-07					
Copper	**7.8**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**6.5**	5.0	EPA 200.8	4-27-20	4-29-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**MONM-20200422**					
Laboratory ID:	04-152-08					
Copper	**3.5**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**22**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**SEIMN-20200422**					
Laboratory ID:	04-152-09					
Copper	**1.0**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**ND**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**SEIMS-20200422**					
Laboratory ID:	04-152-10					
Copper	**1.6**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**5.4**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**TOSMI-20200422**					
Laboratory ID:	04-152-11					
Copper	**14**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**160**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**TOSMO-20200422**					
Laboratory ID:	04-152-12					
Copper	**16**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**140**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**TYLMI-20200422**					
Laboratory ID:	04-152-13					
Copper	**38**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**19**	5.0	EPA 200.8	4-27-20	4-29-20	
Client ID:	**TYLMO-20200422**					
Laboratory ID:	04-152-14					
Copper	**20**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**53**	5.0	EPA 200.8	4-27-20	4-29-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**QA85-20200422**					
Laboratory ID:	04-152-15					
Copper	**13**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**150**	5.0	EPA 200.8	4-27-20	4-29-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	MB0427WH2					
Copper	**ND**	1.0	EPA 200.8	4-27-20	4-29-20	
Zinc	**ND**	5.0	EPA 200.8	4-27-20	4-29-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	04-152-04										
	ORIG	DUP									
Copper	**1.58**	**1.87**	NA	NA		NA		NA	17	20	
Zinc	**7.76**	**6.56**	NA	NA		NA		NA	17	20	
MATRIX SPIKES											
Laboratory ID:	04-152-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**98.8**	**98.8**	100	100	1.58	**97**	**97**	75-125	0	20	
Zinc	**108**	**109**	100	100	7.76	**100**	**101**	75-125	1	20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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-20200422**					
Laboratory ID:	04-152-01					
Copper	**ND**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	
Client ID:	**COUMI-20200422**					
Laboratory ID:	04-152-02					
Copper	**4.8**	1.0	EPA 200.8		4-27-20	
Zinc	**5.2**	5.0	EPA 200.8		4-27-20	
Client ID:	**COUMO-20200422**					
Laboratory ID:	04-152-03					
Copper	**6.0**	1.0	EPA 200.8		4-27-20	
Zinc	**23**	5.0	EPA 200.8		4-27-20	
Client ID:	**EVAMS-20200422**					
Laboratory ID:	04-152-04					
Copper	**ND**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	
Client ID:	**EVALSS-20200422**					
Laboratory ID:	04-152-05					
Copper	**ND**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	
Client ID:	**MONMN-20200422**					
Laboratory ID:	04-152-06					
Copper	**ND**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	
Client ID:	**MONMS-20200422**					
Laboratory ID:	04-152-07					
Copper	**5.7**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**MONM-20200422**					
Laboratory ID:	04-152-08					
Copper	**2.3**	1.0	EPA 200.8		4-27-20	
Zinc	**8.2**	5.0	EPA 200.8		4-27-20	
Client ID:	**SEIMN-20200422**					
Laboratory ID:	04-152-09					
Copper	**ND**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	
Client ID:	**SEIMS-20200422**					
Laboratory ID:	04-152-10					
Copper	**ND**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	
Client ID:	**TOSMI-20200422**					
Laboratory ID:	04-152-11					
Copper	**7.7**	1.0	EPA 200.8		4-27-20	
Zinc	**46**	5.0	EPA 200.8		4-27-20	
Client ID:	**TOSMO-20200422**					
Laboratory ID:	04-152-12					
Copper	**8.9**	1.0	EPA 200.8		4-27-20	
Zinc	**45**	5.0	EPA 200.8		4-27-20	
Client ID:	**TYLMI-20200422**					
Laboratory ID:	04-152-13					
Copper	**28**	1.0	EPA 200.8		4-27-20	
Zinc	**5.7**	5.0	EPA 200.8		4-27-20	
Client ID:	**TYLMO-20200422**					
Laboratory ID:	04-152-14					
Copper	**14**	1.0	EPA 200.8		4-27-20	
Zinc	**26**	5.0	EPA 200.8		4-27-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	**QA85-20200422**					
Laboratory ID:	04-152-15					
Copper	**7.6**	1.0	EPA 200.8		4-27-20	
Zinc	**47**	5.0	EPA 200.8		4-27-20	

Date of Report: May 5, 2020
Samples Submitted: April 22, 2020
Laboratory Reference: 2004-152
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:	MB0427D1					
Copper	**ND**	1.0	EPA 200.8		4-27-20	
Zinc	**ND**	5.0	EPA 200.8		4-27-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	04-152-15										
	ORIG	DUP									
Copper	**7.56**	**7.82**	NA	NA		NA		NA	3	20	
Zinc	**47.0**	**48.6**	NA	NA		NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	04-152-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**74.8**	**73.2**	80.0	80.0	7.56	**84**	**82**	75-125	2	20	
Zinc	**122**	**121**	80.0	80.0	47.0	**94**	**92**	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

May 5 2020
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-20200422	Water	20-A005354	Micro, NUT
COUMI-20200422	Water	20-A005355	Micro, NUT
COUMO-20200422	Water	20-A005356	Micro, NUT
EVAMS-20200422	Water	20-A005357	Micro, NUT
EVALSS-20200422	Water	20-A005358	Micro, NUT
MONMN-20200422	Water	20-A005359	Micro, NUT
MONMS-20200422	Water	20-A005360	Micro, NUT
MONM-20200422	Water	20-A005361	Micro, NUT
SEIMN-20200422	Water	20-A005362	Micro, NUT
SEIMS-20200422	Water	20-A005363	Micro, NUT
TOSMI-20200422	Water	20-A005364	Micro, NUT
TOSMO-20200422	Water	20-A005365	Micro, NUT
TYLMI-20200422	Water	20-A005366	Micro, NUT
TYLMO-20200422	Water	20-A005367	Micro, NUT
QA85-20200422	Water	20-A005368	Micro, NUT

Your samples were received on Thursday, April 23, 2020. 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 5 2020
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: 04-152

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: BLAIR GOODROW
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 04-152
All results reported on an as received basis.

Date Received: 04/23/20
Date Reported: 5/ 5/20

AMTEST Identification Number **20-A005354**
Client Identification **COLM-20200422**
Sampling Date **04/22/20, 15:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	18.	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.831	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.052	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005355**
Client Identification **COUMI-20200422**
Sampling Date **04/22/20, 12:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	980	CFU/100 ml		20	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.07	mg/l		0.1			
Total Nitrogen (TKN)	0.832	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005356**
Client Identification **COUMO-20200422**
Sampling Date **04/22/20, 12:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	610	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.40	mg/l		0.1			
Total Nitrogen (TKN)	1.10	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.30	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005357**
Client Identification **EVAMS-20200422**
Sampling Date **04/22/20, 13:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		20	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	2.59	mg/l		0.1			
Total Nitrogen (TKN)	0.990	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	1.6	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005358**
Client Identification **EVALSS-20200422**
Sampling Date **04/22/20, 13:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	120	CFU/100 ml		20	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	2.07	mg/l		0.1			
Total Nitrogen (TKN)	0.873	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	1.2	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005359**
Client Identification **MONMN-20200422**
Sampling Date **04/22/20, 14:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	290	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.15	mg/l		0.1			
Total Nitrogen (TKN)	1.05	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.097	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005360**
Client Identification **MONMS-20200422**
Sampling Date **04/22/20, 15:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	0.81	mg/l		0.1			
Total Nitrogen (TKN)	0.644	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.17	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005361**
Client Identification **MONM-20200422**
Sampling Date **04/22/20, 15:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	150	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.15	mg/l		0.1			
Total Nitrogen (TKN)	0.952	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.20	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005362**
Client Identification **SEIMN-20200422**
Sampling Date **04/22/20, 14:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	230	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	0.74	mg/l		0.1			
Total Nitrogen (TKN)	0.605	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005363**
Client Identification **SEIMS-20200422**
Sampling Date **04/22/20, 15:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		20	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.52	mg/l		0.1			
Total Nitrogen (TKN)	1.34	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.18	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005364**
Client Identification **TOSMI-20200422**
Sampling Date **04/22/20, 12:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	190	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.74	mg/l		0.1			
Total Nitrogen (TKN)	1.48	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005365**
Client Identification **TOSMO-20200422**
Sampling Date **04/22/20, 13:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	74.	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.95	mg/l		0.1			
Total Nitrogen (TKN)	1.67	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005366**
Client Identification **TYLMI-20200422**
Sampling Date **04/22/20, 14:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	170	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.20	mg/l		0.1			
Total Nitrogen (TKN)	0.914	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005367**
Client Identification **TYLMO-20200422**
Sampling Date **04/22/20, 13:45**

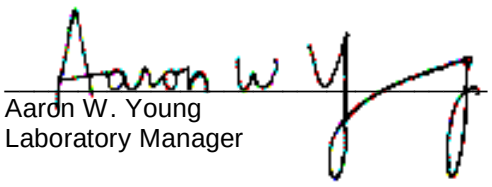
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1600	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.02	mg/l		0.1			
Total Nitrogen (TKN)	0.810	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.21	mg/l		0.02	SM4500NO3	SH	04/29/20

AMTEST Identification Number **20-A005368**
Client Identification **QA85-20200422**
Sampling Date **04/22/20, 12:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	600	CFU/100 ml		2	SM 9222D	JM	04/23/20
Total Nitrogen (NOX&TKN)	1.72	mg/l		0.1			
Total Nitrogen (TKN)	1.46	mg/l		0.2	SM4500N	SH	05/05/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	SH	04/29/20



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: 20-A005354 to 20-A005368

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A005347	Fecal coliform	CFU/100 ml	< 1	< 1	
20-A005353	Fecal coliform	CFU/100 ml	< 2	2.	
20-A005371	Fecal coliform	CFU/100 ml	2.	1.	67.
20-A005362	Total Nitrogen (TKN)	mg/l	0.605	0.618	2.1
20-A005431	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
20-A005605	Total Nitrogen (TKN)	mg/l	0.278	0.288	3.5
20-A005615	Total Nitrogen (TKN)	mg/l	< 0.2	< 0.2	
20-A005356	Total Nitrate + Nitrite	mg/l	0.30	0.29	3.4
20-A005366	Total Nitrate + Nitrite	mg/l	0.29	0.28	3.5
20-A005509	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A005362	Total Nitrogen (TKN)	mg/l	0.605	2.66	2.00	102.75 %
20-A005431	Total Nitrogen (TKN)	mg/l	< 0.2	2.24	2.00	112.00 %
20-A005605	Total Nitrogen (TKN)	mg/l	0.278	2.36	2.00	104.10 %
20-A005615	Total Nitrogen (TKN)	mg/l	< 0.2	2.22	2.00	111.00 %
20-A005356	Total Nitrate + Nitrite	mg/l	0.30	1.2	1.0	90.00 %
20-A005366	Total Nitrate + Nitrite	mg/l	0.29	1.2	1.0	91.00 %
20-A005509	Total Nitrate + Nitrite	mg/l	< 0.02	0.90	1.0	90.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.03	103. %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrogen (TKN)	mg/l	1.00	1.03	103. %
Total Nitrate + Nitrite	mg/l	1.0	0.92	92.0 %
Total Nitrate + Nitrite	mg/l	1.0	0.93	93.0 %
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	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2

QC Summary for sample numbers: 20-A005354 to 20-A005368...

BLANKS continued....

ANALYTE	UNITS	RESULT
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

OnSite Environmental Inc.

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

Laboratory Reference #: 04-152

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-20200422 5354	4/22/20	15:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200422 55	4/22/20	12:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200422 56	4/22/20	12:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200422 57	4/22/20	13:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200422 58	4/22/20	13:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200422 59	4/22/20	14:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200422 60	4/22/20	15:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200422 61	4/22/20	15:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200422 62	4/22/20	14:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200422 63	4/22/20	15:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:		OnSite Env	4/22/2	1730	
Received by:					**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 #: 02-200

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 (circled)

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-20200422 5364	4/22/20	12:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200422 65	4/22/20	13:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200422 66	4/22/20	14:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200422 67	4/22/20	13:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA85-20200422 68	4/22/20	12:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time
Relinquished by:	[signature]	OnSite Env	4/22/20	1730
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

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. 04-152

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-2020 0422	4/22/20	1515	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020 0422		1255	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020 0422		1240	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020 0422		1345	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020 0422		1355	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020 0422		1445	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020 0422		1505	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020 0422		1545	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020 0422		1435	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020 0422		1550	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020 0422		1245	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020 0422		1320	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020 0422		1405	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020 0422		1345	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 85-20200422		1245	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Mike Bartlett Date 04/22 Received by [illegible] Date 4/22

Firm Herrera Time 1635 Firm GSE 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 · (425) 883-3881

Laboratory Reference #: 05-165

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-20200521 6960	5/21/20	12:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200521 61	5/21/20	12:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200521 62	5/21/20	10:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200521 63	5/21/20	12:58	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA86-20200521 64	5/21/20	12:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	5/21/20	1730	
Received by:				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. 05-165

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-2020 0521	05/21/20	14:30	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		11:50	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		12:10	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		12:40	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		12:55	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020		13:35	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020		13:55	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020		15:10	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		13:50	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		14:15	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		12:10	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		12:30	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020		1315	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020		12:55	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 86-2020		12:15	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nick Bartol Date 05/21 Received by Heather Cook Date 5/21

Firm Herrera Time 15:30 Firm OSE Time 1530

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.

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-2020 0422	4/22/20		Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			
	QA 85-2020 0422			Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by _____ Date _____ Received by [signature] Date 4/22

Firm _____ Time _____ Firm GSE 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

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number:	14-05806-000
Personnel Performing Calibration:	N. Bartlett
Meter:	~~YSI~~ ProDSS
Date/Time:	04/21/20 12:15
Barometric Pressure Start of Day:	mmHg: 772.0 Time: 12:15
Barometric Pressure End of Day:	mmHg: 772.0 Time: 13:00

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.4	0	22.8	
Conductivity (µS/cm)	990	1,000	22.7	
Conductivity (µS/cm)	102.2	100	22.9	
DO % Saturation	100.4	100	22.8	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.5	0	22.7	
Conductivity (µS/cm)	99.3	100	22.9	
DO % Saturation	100.5	100	22.5	

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 Bartlett
Meter:	PRoDSS #1
Date/Time:	04/21/20 12:15
Barometric Pressure Start of Day:	mmHg: 722.8 Time: 12:15
Barometric Pressure End of Day:	mmHg: 721.7 Time: 13:00

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.9	0	22.4	
Conductivity (µS/cm)	972	1,000	22.0	
Conductivity (µS/cm)	104.5	100	22.2	
DO % Saturation	101.2	100	22.1	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.7	0	22.1	
Conductivity (µS/cm)	96.6	100	22.2	
DO % Saturation	100.6	100	24.9	

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.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, J. Watson

Sample Date: 4/22/20 **Sample Time:** 1345 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1350 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: 50° Rainy

Water Quality Sampling

Sample ID: EVAMS-20200422

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: reddish brown

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 3.82

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.7

Specific Conductivity (µs/cm) 184.2

Dissolved Oxygen (mg/L) 11.15

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, J. Watson

Sample Date: 4/22/20 **Sample Time:** 1355 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1400 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: 50° Rainy

Water Quality Sampling

Sample ID: EVALSS-20200422

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: light brown

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.36

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.6

Specific Conductivity (µs/cm) 176.1

Dissolved Oxygen (mg/L) 11.49

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, NB

Sample Date: 04/22/20 **Sample Time:** 14:45 PDT:

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

(Must filter within 15 minutes of collection)

SITE ID: MONMN20200422

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 50°F

Water Quality Sampling

Sample ID: MONMN20200422

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:	Fairly clear
Color:	little-to-none
Odor:	None
Sheen:	
Floatables:	Small particulate

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 9.30

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 163.0

Dissolved Oxygen (mg/L) 10.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, KB

Sample Date: 04/22/20 **Sample Time:** 1405 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1410 PST:

(Must filter within 15 minutes of collection)

SITE ID: TYLM20200422

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 53°F Rain

Water Quality Sampling

Sample ID: TYLM20200422

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:	Murky
Color:	none
Odor:	/
Sheen:	/
Floatables:	✓

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 4.37 ft

Reference Point (description): Middle Log

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 113.3

Dissolved Oxygen (mg/L) 10.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, KB

Sample Date: 04/22/20 **Sample Time:** 13:45 PDT:

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

(Must filter within 15 minutes of collection)

SITE ID: TYLN02020422

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 50°F

Water Quality Sampling

Sample ID: TYLN02020422

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:	norm.
Odor:	↓
Sheen:	↓
Floatables:	↓

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.66

Reference Point (description): Meram down Culvert

Water Quality Measurments

Temperature (°C) 11.9°C

Specific Conductivity (µs/cm) 76.2

Dissolved Oxygen (mg/L) 10.28

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, IL B

Sample Date: 01/22/2020 **Sample Time:** 1320 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1325 PST:

(Must filter within 15 minutes of collection)

SITE ID: TOSM02020022

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 50°F

Water Quality Sampling

Sample ID: TOSM02020022

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: Mostly clear

Color: Slightly Tannin

Odor: None

Sheen: ↓

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.8

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 11.3°C

Specific Conductivity (µs/cm) 113.4

Dissolved Oxygen (mg/L) 10.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, KB

Sample Date: 04/22/20 **Sample Time:** 12:55 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 13:00 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUM120200422

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 50°F

Water Quality Sampling

Sample ID: COUM120200422

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:	Murky
Color:	Brown
Odor:	None
Sheen:	None
Floatables:	Some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.6

Reference Point (description): Sill

Water Quality Measurments

Temperature (°C) 10.5

Specific Conductivity (µs/cm) 189.6

Dissolved Oxygen (mg/L) 10.83

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Bartlett, K. Bliss

Sample Date: 04/22/20 **Sample Time:** 12:40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:45 PST:

(Must filter within 15 minutes of collection)

SITE ID: COUNO20200422

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 50°F

Water Quality Sampling

Sample ID: COUNO20200422

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:	"
Odor:	None
Sheen:	"
Floatables:	"

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 1.45

Reference Point (description): staff in

Water Quality Measurments

Temperature (°C) 11.6

Specific Conductivity (µs/cm) 124.1

Dissolved Oxygen (mg/L) 10.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, RB

Sample Date: 04/22/22 **Sample Time:** 15:05 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 15:10 PST:

(Must filter within 15 minutes of collection)

SITE ID: MONMS20220422

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 57°F, Rainy

Water Quality Sampling

Sample ID: MONMS20220422

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:	dirty
Color:	brown
Odor:	none
Sheen:	
Floatables:	small particulates

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 7.2ft

Reference Point (description): Western corner

Water Quality Measurments

Temperature (°C) 11.4

Specific Conductivity (µs/cm) 179.3

Dissolved Oxygen (mg/L) 8.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NG

Sample Date: 04/22/20 **Sample Time:** 1550 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1555 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: Overcast, 50°F

Water Quality Sampling

Sample ID: SEIMS20200422

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:	Low
Color:	Yellow
Odor:	none
Sheen:	
Floatables:	small particles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.85

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 9.8

Specific Conductivity (µs/cm) 91.6

Dissolved Oxygen (mg/L) 10.53

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, J. Watson

Sample Date: 4/22/20 **Sample Time:** 1435 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1440 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: 50° Rainy

Water Quality Sampling

Sample ID: SEIMN-20200422

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: **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): 0.64 ft

Reference Point (description): top of bolt

Water Quality Measurments

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 71.3

Dissolved Oxygen (mg/L) 11.45

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, J. Watson

Sample Date: 4/22/20 **Sample Time:** 1515 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1520 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: 50° Rainy

Water Quality Sampling

Sample ID: COLM-20200422

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: reddish brown

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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) 9.5

Specific Conductivity (µs/cm) 37.1

Dissolved Oxygen (mg/L) 10.30

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, J. Watson

Sample Date: 4/22/20 **Sample Time:** 1545 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1550 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: 50° Rainy

Water Quality Sampling

Sample ID: MONM-20200422

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: **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): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 10.5

Specific Conductivity (µs/cm) 174.9

Dissolved Oxygen (mg/L) 11.6

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, J. Watson

Sample Date: 4/22/20 **Sample Time:** 1245/1255 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1250/1300 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: 50° Rainy

Water Quality Sampling

Sample ID: TOSMI-20200422

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: QA85-20200422

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: **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): 1.07

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.1

Specific Conductivity (µs/cm) 52.6

Dissolved Oxygen (mg/L) 10.73

Data Quality Assurance Worksheet

By J. Brown

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

Date 6/8/20 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: 4/22/20 /All locations, QA85 (TOSMI) Lab Ref No 2004-152

date 6/29/2020

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**	104	**±20**	23	**≤ 25**	18	**≤ 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	NONE
Hardness	OK / SM 2340B	NA	**NA**	6	**≤180**	≤1.0 mg/L 1.0 mg/L	98, 98	**±25**	103	**±15**	1	**≤ 20**	0	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	8	**≤28**	≤1.0 mg/L 1.0 mg/L	95	**±25**	103	**±15**	0	**≤ 20**	2	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	99	**±25**	94	**±20**	NC	**≤ 20**	21	**≤ 20**	OK	NO FLAG FOR MARGINAL FIELD DUPE EXCEEDANCE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	7, 13	**≤28**	≤0.1 mg/L 0.1 mg/L	90-112	**±25**	92-103	**±20**	NC, 2, D=0.01	**≤ 20**	0, 1	**≤ 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 6/8/20 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: 4/22/20 /All locations, QA85 (TOSMI) Lab Ref No 2004-152

date 6/29/2020

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	97, 97	**±25**	NR	**±15**	D=0.29 MS 0	**≤ 20**	7	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	100, 101	**±25**	NR	**±15**	D=1.2 MS 1	**≤ 20**	6	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	5	**≤180**	≤1.0 µg/L 1.0 µg/L	84, 82	**±25**	NR	**±15**	3, MS 2	**≤ 20**	1	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	94, 92	**±25**	NR	**±15**	3, MS 1	**≤ 20**	2	**≤ 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=1	**≤ 35**	104	**≤ 50**	OK	FLAG TOSMI J DUE TO FIELD DUPE 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

June 10, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2005-165

Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on May 21, 2020.

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: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
Project: 14-05806-000

Case Narrative

Samples were collected on May 21, 2020 and received by the laboratory on May 21, 2020. 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: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-01					
Total Suspended Solids	**4.0**	1.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**COUMI-20200521**					
Laboratory ID:	05-165-02					
Total Suspended Solids	**26**	2.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**COUMO-20200521**					
Laboratory ID:	05-165-03					
Total Suspended Solids	**44**	2.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**EVAMS-20200521**					
Laboratory ID:	05-165-04					
Total Suspended Solids	**18**	2.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**EVALSS-20200521**					
Laboratory ID:	05-165-05					
Total Suspended Solids	**25**	2.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**MONMN-20200521**					
Laboratory ID:	05-165-06					
Total Suspended Solids	**7.0**	1.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**MONMS-20200521**					
Laboratory ID:	05-165-07					
Total Suspended Solids	**2.8**	1.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**MONM-20200521**					
Laboratory ID:	05-165-08					
Total Suspended Solids	**8.8**	1.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**SEIMN-20200521**					
Laboratory ID:	05-165-09					
Total Suspended Solids	**26**	2.0	SM 2540D	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	**SEIMS-20200521**					
Laboratory ID:	05-165-10					
Total Suspended Solids	**14**	2.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**TOSMI-20200521**					
Laboratory ID:	05-165-11					
Total Suspended Solids	**34**	1.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**TOSMO-20200521**					
Laboratory ID:	05-165-12					
Total Suspended Solids	**47**	2.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**TYLMI-20200521**					
Laboratory ID:	05-165-13					
Total Suspended Solids	**16**	1.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**TYLMO-20200521**					
Laboratory ID:	05-165-14					
Total Suspended Solids	**7.4**	1.0	SM 2540D	5-22-20	5-26-20	
Client ID:	**QA86-20200521**					
Laboratory ID:	05-165-15					
Total Suspended Solids	**40**	2.0	SM 2540D	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	MB0522W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	5-22-20	5-26-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	05-165-03								
	ORIG	DUP							
Total Suspended Solids	**43.6**	**43.2**	NA	NA	NA	NA	1	21	
SPIKE BLANK									
Laboratory ID:	SB0522W1								
	SB		SB		SB				
Total Suspended Solids	**95.0**		100	NA	95	57-126	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20200521**					
Laboratory ID:	05-165-01					
Turbidity	**2.2**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**COUMI-20200521**					
Laboratory ID:	05-165-02					
Turbidity	**18**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**COUMO-20200521**					
Laboratory ID:	05-165-03					
Turbidity	**24**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**EVAMS-20200521**					
Laboratory ID:	05-165-04					
Turbidity	**13**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**EVALSS-20200521**					
Laboratory ID:	05-165-05					
Turbidity	**12**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**MONMN-20200521**					
Laboratory ID:	05-165-06					
Turbidity	**5.4**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**MONMS-20200521**					
Laboratory ID:	05-165-07					
Turbidity	**3.5**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**MONM-20200521**					
Laboratory ID:	05-165-08					
Turbidity	**5.3**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**SEIMN-20200521**					
Laboratory ID:	05-165-09					
Turbidity	**12**	0.10	EPA 180.1	5-22-20	5-22-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200521**					
Laboratory ID:	05-165-10					
Turbidity	**7.0**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**TOSMI-20200521**					
Laboratory ID:	05-165-11					
Turbidity	**14**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**TOSMO-20200521**					
Laboratory ID:	05-165-12					
Turbidity	**21**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**TYLMI-20200521**					
Laboratory ID:	05-165-13					
Turbidity	**6.6**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**TYLMO-20200521**					
Laboratory ID:	05-165-14					
Turbidity	**4.0**	0.10	EPA 180.1	5-22-20	5-22-20	
Client ID:	**QA86-20200521**					
Laboratory ID:	05-165-15					
Turbidity	**25**	0.10	EPA 180.1	5-22-20	5-22-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	MB0522W1					
Turbidity	**ND**	0.10	EPA 180.1	5-22-20	5-22-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	05-165-02								
	ORIG	DUP							
Turbidity	**18.3**	**18.9**	NA	NA	NA	NA	3	14	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-01					
Hardness	**12**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**COUMI-20200521**					
Laboratory ID:	05-165-02					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**COUMO-20200521**					
Laboratory ID:	05-165-03					
Hardness	**98**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**EVAMS-20200521**					
Laboratory ID:	05-165-04					
Hardness	**67**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**EVALSS-20200521**					
Laboratory ID:	05-165-05					
Hardness	**64**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**MONMN-20200521**					
Laboratory ID:	05-165-06					
Hardness	**50**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**MONMS-20200521**					
Laboratory ID:	05-165-07					
Hardness	**90**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-08					
Hardness	**57**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**SEIMN-20200521**					
Laboratory ID:	05-165-09					
Hardness	**24**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**SEIMS-20200521**					
Laboratory ID:	05-165-10					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**TOSMI-20200521**					
Laboratory ID:	05-165-11					
Hardness	**40**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**TOSMO-20200521**					
Laboratory ID:	05-165-12					
Hardness	**44**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**TYLMI-20200521**					
Laboratory ID:	05-165-13					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	
Client ID:	**TYLMO-20200521**					
Laboratory ID:	05-165-14					
Hardness	**44**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	**QA86-20200521**					
Laboratory ID:	05-165-15					
Hardness	**97**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	MB0522WH2					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	5-22-20	5-26-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	05-165-01										
	ORIG	DUP									
Hardness	**11.8**	**11.8**	NA		NA	NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	05-165-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**134**	**136**	132	132	11.8	93	94	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0522WH2										
	SB		SB			SB					
Hardness	**120**		132		NA	91		85-115	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-01					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**COUMI-20200521**					
Laboratory ID:	05-165-02					
Dissolved Organic Carbon	**8.4**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**COUMO-20200521**					
Laboratory ID:	05-165-03					
Dissolved Organic Carbon	**8.0**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**EVAMS-20200521**					
Laboratory ID:	05-165-04					
Dissolved Organic Carbon	**14**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**EVALSS-20200521**					
Laboratory ID:	05-165-05					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**MONMN-20200521**					
Laboratory ID:	05-165-06					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**MONMS-20200521**					
Laboratory ID:	05-165-07					
Dissolved Organic Carbon	**7.7**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**MONM-20200521**					
Laboratory ID:	05-165-08					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**SEIMN-20200521**					
Laboratory ID:	05-165-09					
Dissolved Organic Carbon	**13**	1.0	SM 5310B	5-26-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	**SEIMS-20200521**					
Laboratory ID:	05-165-10					
Dissolved Organic Carbon	**9.1**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**TOSMI-20200521**					
Laboratory ID:	05-165-11					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**TOSMO-20200521**					
Laboratory ID:	05-165-12					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**TYLMI-20200521**					
Laboratory ID:	05-165-13					
Dissolved Organic Carbon	**7.0**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**TYLMO-20200521**					
Laboratory ID:	05-165-14					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	5-26-20	5-26-20	
Client ID:	**QA86-20200521**					
Laboratory ID:	05-165-15					
Dissolved Organic Carbon	**8.1**	1.0	SM 5310B	5-26-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	MB0526D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	5-26-20	5-26-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	05-165-05								
	ORIG	DUP							
Dissolved Organic Carbon	**13.3**	**13.4**	NA	NA	NA	NA	1	15	
MATRIX SPIKE									
Laboratory ID:	05-165-05								
	MS		MS		MS				
Dissolved Organic Carbon	**24.0**		10.0	13.3	107	72-132	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0526D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.1**		10.0	NA	111	82-123	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-01					
Total Phosphorus	**0.035**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**COUMI-20200521**					
Laboratory ID:	05-165-02					
Total Phosphorus	**0.12**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**COUMO-20200521**					
Laboratory ID:	05-165-03					
Total Phosphorus	**0.14**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**EVAMS-20200521**					
Laboratory ID:	05-165-04					
Total Phosphorus	**0.066**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**EVALSS-20200521**					
Laboratory ID:	05-165-05					
Total Phosphorus	**0.065**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**MONMN-20200521**					
Laboratory ID:	05-165-06					
Total Phosphorus	**0.054**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**MONMS-20200521**					
Laboratory ID:	05-165-07					
Total Phosphorus	**0.039**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**MONM-20200521**					
Laboratory ID:	05-165-08					
Total Phosphorus	**0.054**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**SEIMN-20200521**					
Laboratory ID:	05-165-09					
Total Phosphorus	**0.090**	0.010	EPA 365.1	5-26-20	5-28-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	**SEIMS-20200521**					
Laboratory ID:	05-165-10					
Total Phosphorus	**0.061**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**TOSMI-20200521**					
Laboratory ID:	05-165-11					
Total Phosphorus	**0.095**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**TOSMO-20200521**					
Laboratory ID:	05-165-12					
Total Phosphorus	**0.099**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**TYLMI-20200521**					
Laboratory ID:	05-165-13					
Total Phosphorus	**0.067**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**TYLMO-20200521**					
Laboratory ID:	05-165-14					
Total Phosphorus	**0.049**	0.010	EPA 365.1	5-26-20	5-28-20	
Client ID:	**QA86-20200521**					
Laboratory ID:	05-165-15					
Total Phosphorus	**0.15**	0.010	EPA 365.1	5-26-20	5-28-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	MB0526W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	5-26-20	5-28-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	05-165-01								
	ORIG	DUP							
Total Phosphorus	**0.0350**	**0.0333**	NA	NA	NA	NA	5	14	
MATRIX SPIKE									
Laboratory ID:	05-165-01								
	MS		MS		MS				
Total Phosphorus	**0.266**		0.250	0.0350	92	80-110	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0526W1								
	SB		SB		SB				
Total Phosphorus	**0.235**		0.250	NA	94	78-110	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-01					
Copper	**ND**	1.0	EPA 200.8	5-22-20	5-25-20	
Zinc	**ND**	5.0	EPA 200.8	5-22-20	5-25-20	
Client ID:	**COUMI-20200521**					
Laboratory ID:	05-165-02					
Copper	**3.6**	1.0	EPA 200.8	5-22-20	5-25-20	
Zinc	**51**	5.0	EPA 200.8	5-22-20	5-25-20	
Client ID:	**COUMO-20200521**					
Laboratory ID:	05-165-03					
Copper	**4.0**	1.0	EPA 200.8	5-22-20	5-25-20	
Zinc	**330**	25	EPA 200.8	5-22-20	5-26-20	
Client ID:	**EVAMS-20200521**					
Laboratory ID:	05-165-04					
Copper	**1.4**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**5.7**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**EVALSS-20200521**					
Laboratory ID:	05-165-05					
Copper	**2.1**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**ND**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**MONMN-20200521**					
Laboratory ID:	05-165-06					
Copper	**1.7**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**8.6**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**MONMS-20200521**					
Laboratory ID:	05-165-07					
Copper	**1.8**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**ND**	5.0	EPA 200.8	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-08					
Copper	**1.4**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**39**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**SEIMN-20200521**					
Laboratory ID:	05-165-09					
Copper	**1.7**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**ND**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**SEIMS-20200521**					
Laboratory ID:	05-165-10					
Copper	**1.1**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**ND**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**TOSMI-20200521**					
Laboratory ID:	05-165-11					
Copper	**5.4**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**71**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**TOSMO-20200521**					
Laboratory ID:	05-165-12					
Copper	**4.9**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**44**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**TYLMI-20200521**					
Laboratory ID:	05-165-13					
Copper	**6.1**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**16**	5.0	EPA 200.8	5-22-20	5-26-20	
Client ID:	**TYLMO-20200521**					
Laboratory ID:	05-165-14					
Copper	**3.6**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**23**	5.0	EPA 200.8	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	**QA86-20200521**					
Laboratory ID:	05-165-15					
Copper	**3.9**	1.0	EPA 200.8	5-22-20	5-26-20	
Zinc	**350**	25	EPA 200.8	5-22-20	5-26-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	MB0522WH1					
Copper	**ND**	1.0	EPA 200.8	5-22-20	5-25-20	
Zinc	**ND**	5.0	EPA 200.8	5-22-20	5-25-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	05-165-04										
	ORIG	DUP									
Copper	**1.39**	**1.36**	NA	NA		NA		NA	2	20	
Zinc	**5.70**	**5.44**	NA	NA		NA		NA	5	20	
MATRIX SPIKES											
Laboratory ID:	05-165-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**101**	**101**	100	100	1.39	**99**	**99**	75-125	0	20	
Zinc	**112**	**112**	100	100	5.70	**107**	**106**	75-125	0	20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-01					
Copper	**ND**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	
Client ID:	**COUMI-20200521**					
Laboratory ID:	05-165-02					
Copper	**2.4**	1.0	EPA 200.8		5-29-20	
Zinc	**32**	5.0	EPA 200.8		5-29-20	
Client ID:	**COUMO-20200521**					
Laboratory ID:	05-165-03					
Copper	**2.1**	1.0	EPA 200.8		5-29-20	
Zinc	**230**	13	EPA 200.8		5-29-20	
Client ID:	**EVAMS-20200521**					
Laboratory ID:	05-165-04					
Copper	**ND**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	
Client ID:	**EVALSS-20200521**					
Laboratory ID:	05-165-05					
Copper	**1.4**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	
Client ID:	**MONMN-20200521**					
Laboratory ID:	05-165-06					
Copper	**1.3**	1.0	EPA 200.8		5-29-20	
Zinc	**6.0**	5.0	EPA 200.8		5-29-20	
Client ID:	**MONMS-20200521**					
Laboratory ID:	05-165-07					
Copper	**1.5**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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-20200521**					
Laboratory ID:	05-165-08					
Copper	**1.0**	1.0	EPA 200.8		5-29-20	
Zinc	**24**	5.0	EPA 200.8		5-29-20	
Client ID:	**SEIMN-20200521**					
Laboratory ID:	05-165-09					
Copper	**1.0**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	
Client ID:	**SEIMS-20200521**					
Laboratory ID:	05-165-10					
Copper	**ND**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	
Client ID:	**TOSMI-20200521**					
Laboratory ID:	05-165-11					
Copper	**3.4**	1.0	EPA 200.8		5-29-20	
Zinc	**29**	5.0	EPA 200.8		5-29-20	
Client ID:	**TOSMO-20200521**					
Laboratory ID:	05-165-12					
Copper	**2.4**	1.0	EPA 200.8		5-29-20	
Zinc	**14**	5.0	EPA 200.8		5-29-20	
Client ID:	**TYLMI-20200521**					
Laboratory ID:	05-165-13					
Copper	**2.8**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	
Client ID:	**TYLMO-20200521**					
Laboratory ID:	05-165-14					
Copper	**2.9**	1.0	EPA 200.8		5-29-20	
Zinc	**16**	5.0	EPA 200.8		5-29-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	**QA86-20200521**					
Laboratory ID:	05-165-15					
Copper	**1.9**	1.0	EPA 200.8		5-29-20	
Zinc	**220**	13	EPA 200.8		5-29-20	

Date of Report: June 10, 2020
Samples Submitted: May 21, 2020
Laboratory Reference: 2005-165
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:	MB0529D1					
Copper	**ND**	1.0	EPA 200.8		5-29-20	
Zinc	**ND**	5.0	EPA 200.8		5-29-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	05-165-01										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	05-165-01										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**70.6**	**70.8**	80.0	80.0	ND	**88**	**89**	75-125	0	20	
Zinc	**76.4**	**76.6**	80.0	80.0	ND	**96**	**96**	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

Jun 9 2020
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-20200521	Water	20-A006950	Micro, NUT
COUMI-20200521	Water	20-A006951	Micro, NUT
COUMO-20200521	Water	20-A006952	Micro, NUT
EVAMS-20200521	Water	20-A006953	Micro, NUT
EVALSS-20200521	Water	20-A006954	Micro, NUT
MONMN-20200521	Water	20-A006955	Micro, NUT
MONMS-20200521	Water	20-A006956	Micro, NUT
MONM-20200521	Water	20-A006957	Micro, NUT
SEIMN-20200521	Water	20-A006958	Micro, NUT
SEIMS-20200521	Water	20-A006959	Micro, NUT
TOSMI-20200521	Water	20-A006960	Micro, NUT
TOSMO-20200521	Water	20-A006961	Micro, NUT
TYLMI-20200521	Water	20-A006962	Micro, NUT
TYLMO-20200521	Water	20-A006963	Micro, NUT
QA86-20200521	Water	20-A006964	Micro, NUT

Your samples were received on Friday, May 22, 2020. 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

Jun 9 2020
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: 05-165

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: 05-165
All results reported on an as received basis.

Date Received: 05/22/20
Date Reported: 6/ 9/20

AMTEST Identification Number **20-A006950**
Client Identification **COLM-20200521**
Sampling Date **05/21/20, 14:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	46.	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.10	mg/l		0.1			
Total Nitrogen (TKN)	0.996	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.10	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006951**
Client Identification **COUMI-20200521**
Sampling Date **05/21/20, 11:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2800	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.55	mg/l		0.1			
Total Nitrogen (TKN)	1.18	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.37	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006952**
Client Identification **COUMO-20200521**
Sampling Date **05/21/20, 12:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	530	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.63	mg/l		0.1			
Total Nitrogen (TKN)	1.23	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.40	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006953**
Client Identification **EVAMS-20200521**
Sampling Date **05/21/20, 12:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	700	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	2.49	mg/l		0.1			
Total Nitrogen (TKN)	1.39	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006954**
Client Identification **EVALSS-20200521**
Sampling Date **05/21/20, 12:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	2.44	mg/l		0.1			
Total Nitrogen (TKN)	1.45	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.99	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006955**
Client Identification **MONMN-20200521**
Sampling Date **05/21/20, 13:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1500	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.06	mg/l		0.1			
Total Nitrogen (TKN)	0.970	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.094	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006956**
Client Identification **MONMS-20200521**
Sampling Date **05/21/20, 13:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	290	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.02	mg/l		0.1			
Total Nitrogen (TKN)	0.914	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.11	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006957**
Client Identification **MONM-20200521**
Sampling Date **05/21/20, 15:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	650	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.11	mg/l		0.1			
Total Nitrogen (TKN)	0.958	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006958**
Client Identification **SEIMN-20200521**
Sampling Date **05/21/20, 13:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	110	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.47	mg/l		0.1			
Total Nitrogen (TKN)	1.36	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.11	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006959**
Client Identification **SEIMS-20200521**
Sampling Date **05/21/20, 14:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	130	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.31	mg/l		0.1			
Total Nitrogen (TKN)	1.05	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006960**
Client Identification **TOSMI-20200521**
Sampling Date **05/21/20, 12:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1300	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.29	mg/l		0.1			
Total Nitrogen (TKN)	0.996	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006961**
Client Identification **TOSMO-20200521**
Sampling Date **05/21/20, 12:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1900	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.24	mg/l		0.1			
Total Nitrogen (TKN)	0.928	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.31	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006962**
Client Identification **TYLMI-20200521**
Sampling Date **05/21/20, 10:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2000	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.27	mg/l		0.1			
Total Nitrogen (TKN)	0.986	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006963**
Client Identification **TYLMO-20200521**
Sampling Date **05/21/20, 12:58**

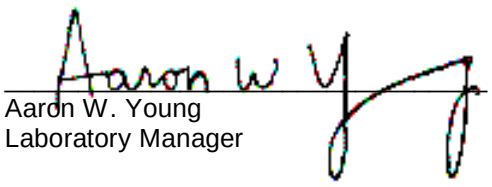
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.12	mg/l		0.1			
Total Nitrogen (TKN)	0.888	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.23	mg/l		0.02	SM4500NO3	AY	06/01/20

AMTEST Identification Number **20-A006964**
Client Identification **QA86-20200521**
Sampling Date **05/21/20, 12:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	530	CFU/100 ml		1	SM 9222D	SB	05/22/20
Total Nitrogen (NOX&TKN)	1.47	mg/l		0.1			
Total Nitrogen (TKN)	1.05	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.42	mg/l		0.02	SM4500NO3	AY	06/01/20



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: 20-A006950 to 20-A006964

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A006950	Fecal coliform	CFU/100 ml	46.	44.	4.4
20-A006964	Fecal coliform	CFU/100 ml	530	560	5.5
20-A006959	Total Nitrogen (TKN)	mg/l	1.05	1.02	2.9
20-A007128	Total Nitrogen (TKN)	mg/l	0.580	0.588	1.4
20-A007282	Total Nitrogen (TKN)	mg/l	0.715	0.714	0.14
20-A007334	Total Nitrogen (TKN)	mg/l	2.09	2.09	0.00
20-A007387	Total Nitrogen (TKN)	mg/l	1.44	1.43	0.70
20-A007414	Total Nitrogen (TKN)	mg/l	0.669	0.668	0.15
20-A006642	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
20-A006833	Total Nitrate + Nitrite	mg/l	0.030	0.031	3.3
20-A006957	Total Nitrate + Nitrite	mg/l	0.15	0.15	0.00
20-A006989	Total Nitrate + Nitrite	mg/l	1.3	1.3	0.00
20-A007004	Total Nitrate + Nitrite	mg/l	12.	11.	8.7
20-A007162	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	
20-A007315	Total Nitrate + Nitrite	mg/l	< 0.02	< 0.02	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A006959	Total Nitrogen (TKN)	mg/l	1.05	2.92	2.00	93.50 %
20-A007128	Total Nitrogen (TKN)	mg/l	0.580	2.62	2.00	102.00 %
20-A007282	Total Nitrogen (TKN)	mg/l	0.715	2.75	2.00	101.75 %
20-A007334	Total Nitrogen (TKN)	mg/l	2.09	4.02	2.00	96.50 %
20-A007387	Total Nitrogen (TKN)	mg/l	1.44	3.34	2.00	95.00 %
20-A007414	Total Nitrogen (TKN)	mg/l	0.669	2.47	2.00	90.05 %
20-A006642	Total Nitrate + Nitrite	mg/l	< 0.02	1.0	1.0	100.00 %
20-A006833	Total Nitrate + Nitrite	mg/l	0.030	1.0	1.0	97.00 %
20-A006957	Total Nitrate + Nitrite	mg/l	0.15	1.2	1.0	105.00 %
20-A006989	Total Nitrate + Nitrite	mg/l	1.3	2.3	1.0	100.00 %
20-A007004	Total Nitrate + Nitrite	mg/l	12.	22.	10.	100.00 %
20-A007162	Total Nitrate + Nitrite	mg/l	< 0.02	0.99	1.0	99.00 %
20-A007315	Total Nitrate + Nitrite	mg/l	< 0.02	1.0	1.0	100.00 %

QC Summary for sample numbers: 20-A006950 to 20-A006964...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.970	97.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.988	98.8 %
Total Nitrogen (TKN)	mg/l	1.00	0.990	99.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.922	92.2 %
Total Nitrogen (TKN)	mg/l	1.00	0.909	90.9 %
Total Nitrogen (TKN)	mg/l	1.00	0.916	91.6 %
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	0.99	99.0 %
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	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
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	< 0.02
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

P.13

OnSite Environmental Inc.

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

Laboratory Reference #: 05-165

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-20200521 6950	5/21/20	14:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200521 51	5/21/20	11:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200521 52	5/21/20	12:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200521 53	5/21/20	12:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200521 54	5/21/20	12:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200521 55	5/21/20	13:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200521 56	5/21/20	13:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200521 57	5/21/20	15:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200521 58	5/21/20	13:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200521 59	5/21/20	14:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:		OSE	5/21/20	1730	
Received by:					**EDDs - CSV**
Relinquished by:					**Reporting Limits:**
Received by:					**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:					**Total Nitrogen - .10 mg/L**
Received by:					

ES-6

OnSite Environmental Inc.

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

Laboratory Reference #: 05-165

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-20200521 6960	5/21/20	12:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200521 61	5/21/20	12:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200521 62	5/21/20	10:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200521 63	5/21/20	12:58	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA86-20200521 64	5/21/20	12:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	5/21/20	1730	
Received by:				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. 05-165

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-2020 0521	05/21/20	14:30	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		11:50	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		12:10	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		12:40	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		12:55	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020		13:35	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020		13:55	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020		15:10	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		13:50	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		14:15	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		12:10	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		12:30	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020		1315	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020		12:55	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 86-2020		12:15	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nick Bartol Date 05/21 Received by Heather Cook Date 5/21

Firm Herrera Time 15:30 Firm OSE Time 1530

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 ___of___

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.

05-165

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-2020 0521	05/21/20	14:30	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		11:50	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		12:10	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		12:40	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		12:55	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020		13:35	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020		13:55	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020		15:10	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		13:50	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		14:15	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		12:10	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		12:30	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020		1215	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020		12:55	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 8-2020		12:15	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nick Bartul Date 05/21 Received by Heather Crow Date 5/21

Firm Herrera Time 15:30 Firm OSE Time 1530

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:	N. Bartish
Meter:	Pro DSS #1
Date/Time:	5/16/20 11:30
Barometric Pressure Start of Day:	mmHg: 760.0 Time: 11:30
Barometric Pressure End of Day:	mmHg: 759.7 Time: 11:45

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.4	0	22.3	
Conductivity (µS/cm)	961	1,000	21.9	
Conductivity (µS/cm)	101.5	100	21.8	
DO % Saturation	100.2	100	22.0	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.0	0	21.9	
Conductivity (µS/cm)	98.1	100	22.1	
DO % Saturation	102.1	100	22.1	

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. Bartish
Meter:	Pro DSS #2
Date/Time:	5/16/20 11:30
Barometric Pressure Start of Day:	mmHg: 760.1 Time: 11:30
Barometric Pressure End of Day:	mmHg: 760.0 Time: 11:45

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.0	0	22.7	
Conductivity (µS/cm)	978	1,000	22.4	
Conductivity (µS/cm)	105.2	100	22.7	
DO % Saturation	98.5	100	22.6	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.0	0	22.7	
Conductivity (µS/cm)	94.8	100	22.8	
DO % Saturation	99.6	100	22.8	

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.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, G. Kayser

Sample Date: 5/21/20 **Sample Time:** 1255 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1300 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: 55 sunny

Water Quality Sampling

Sample ID: TYLMO-20200521

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.80

Reference Point (description): culvert

Water Quality Measurments

Temperature (°C) 12.3

Specific Conductivity (µs/cm) 99.5

Dissolved Oxygen (mg/L) 10.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, G. Kayser

Sample Date: 5/21/20 **Sample Time:** 1230 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1235 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: 50° Cloudy

Water Quality Sampling

Sample ID: TOSMO-20200521

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: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.74

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.5

Specific Conductivity (µs/cm) 103.3

Dissolved Oxygen (mg/L) 10.79

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, G. Kayser

Sample Date: 5/21/20 **Sample Time:** 1150 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1155 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: 50° cloudy

Water Quality Sampling

Sample ID: COUMI-20200521

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:	"
Sheen:	"
Floatables:	"

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 1.44

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.8

Specific Conductivity (µs/cm) 130.4

Dissolved Oxygen (mg/L) 96.5

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N.Maas / G. Kayser

Sample Date: 5/21/20 **Sample Time:** 1210/1215 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1215/1220 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: 50° Rainy

Water Quality Sampling

Sample ID: COUMO-20200521

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: QA86-20200521

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: ↓

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.60

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.9

Specific Conductivity (µs/cm) 208.7

Dissolved Oxygen (mg/L) 97.9

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, G. Kayser

Sample Date: 5/21/20 **Sample Time:** 1335 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1340 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° sunny

Water Quality Sampling

Sample ID: MONMN-20200521

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 9.33

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.7

Specific Conductivity (µs/cm) 117.2

Dissolved Oxygen (mg/L) 10.12

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, B. Kayser

Sample Date: 5/21/20 **Sample Time:** 1415 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1420 PST:

(Must filter within 15 minutes of collection)

SITE ID: SE1MN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp:

Water Quality Sampling

Sample ID: SE1MS-20200521

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: none

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.78

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.8

Specific Conductivity (µs/cm) 93.3

Dissolved Oxygen (mg/L) 10.39

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, G. Kayser

Sample Date: 5/21/20 **Sample Time:** 1355 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1400 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: 60° sunny

Water Quality Sampling

Sample ID: MONMS-20200521

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:	↓
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 6.66

Reference Point (description): top of PVC

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 209.4

Dissolved Oxygen (mg/L) 7.89

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Bartish, K. Diss

Sample Date: 05/21/20 **Sample Time:** 12:10 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:15 PST:

(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: Overcast, 60°F

Water Quality Sampling

Sample ID: TOSM12020052 1

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:	lots of particulate
Color:	Brown
Odor:	None
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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):

Reference Point (description):

Water Quality Measurments

Temperature (°C) 11.6° C

Specific Conductivity (µs/cm) 78.6

Dissolved Oxygen (mg/L) 10.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Barbish, K. Bliss

Sample Date: 05/21/20 **Sample Time:** 12:40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:45 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: Overcast, 60°F

Water Quality Sampling

Sample ID: EVAMS20200521

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: dark, brown

Odor: none

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 3.85

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.3

Specific Conductivity (µs/cm) 146.8

Dissolved Oxygen (mg/L) 11.04

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Bartish, K. Gliss

Sample Date: 05/26/20 **Sample Time:** 12:55 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 13:00 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: Cloudy, 60°F

Water Quality Sampling

Sample ID: EVALS5 20200526

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: Murky

Color: light Brown

Odor: None

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.44

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 10.1°C

Specific Conductivity (µs/cm) 146.2

Dissolved Oxygen (mg/L) 11.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Bartish, K. Christ

Sample Date: 05/21/20 **Sample Time:** 13:50 PDT:

Base Flow or ~~Storm~~ Event? **Field Filtered Time:** 13:54 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: Cloudy, 60°F

Water Quality Sampling

Sample ID: SEIMN20200521

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:

Color: light brown

Odor: none

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.5

Reference Point (description): Measure down

Water Quality Measurments

Temperature (°C) 10.7

Specific Conductivity (µs/cm) 53.8

Dissolved Oxygen (mg/L) 11.01

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Burbidge, K. Dykes

Sample Date: 05/21/20 **Sample Time:** 14:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 14:35 PST:

(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: 60°F Cloudy

Water Quality Sampling

Sample ID: COLM2020052

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: Little to none

Odor:

Sheen:

Floatables: Particulate

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 5.62

Reference Point (description): 56

Water Quality Measurments

Temperature (°C) 11.3°

Specific Conductivity (µs/cm) 36.2

Dissolved Oxygen (mg/L) 10.12

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Bartlett, K. Ellis

Sample Date: 05/21/20 **Sample Time:** 15:17 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 15:15 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: Cloudy, 60°F

Water Quality Sampling

Sample ID: MONM

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:

Odor: none

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): —

Reference Point (description): —

Water Quality Measurments

Temperature (°C) 12.3°C

Specific Conductivity (µs/cm) 144.5

Dissolved Oxygen (mg/L) 10.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, G. Kayser

Sample Date: 5/21/20 **Sample Time:** 1315 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1320 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° Sunny

Water Quality Sampling

Sample ID: TYLMI-2020

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 4.35

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 12.2

Specific Conductivity (µs/cm) 96.5

Dissolved Oxygen (mg/L) 10.17

Data Quality Assurance Worksheet

By J. Brown

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

Date 7/2/2020 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: 5/21/20 /All locations, QA86 (COUMO) Lab Ref No 2005-165

date 8/14/2020

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**	95	**±20**	1	**≤ 25**	10	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	3	**≤ 25**	4	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	5	**≤180**	≤1.0 mg/L 1.0 mg/L	93, 94	**±25**	91	**±15**	0 MS 1	**≤ 20**	1	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	5	**≤28**	≤1.0 mg/L 1.0 mg/L	107	**±25**	111	**±15**	1	**≤ 20**	1	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	92	**±25**	94	**±20**	D=0.002	**≤ 20**	7	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	11, 18	**≤28**	≤0.1 mg/L 0.1 mg/L	90-105	**±25**	91-100	**±20**	NC, 0-9 D=0.001-0.008	**≤ 20**	5, 16	**≤ 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 7/2/2020 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: 5/21/20 /All locations, QA86 (COUMO) Lab Ref No 2005-165

date 8/14/2020

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, 5	**≤180**	≤1.0 µg/L 1.0 µg/L	99, 99	**±25**	NR	**±15**	D=0.03 MS 0	**≤ 20**	D=0.10	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	4, 5	**≤180**	≤5.0 µg/L 5.0 µg/L	107, 106	**±25**	NR	**±15**	D=0.26 MS 0	**≤ 20**	6	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤1.0 µg/L 1.0 µg/L	88, 89	**±25**	NR	**±15**	NC MS 0	**≤ 20**	D=0.20	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	8	**≤180**	≤5.0 µg/L 5.0 µg/L	96, 96	**±25**	NR	**±15**	NC MS 0	**≤ 20**	4	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	4, 6	**≤ 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

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

June 10, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2006-005

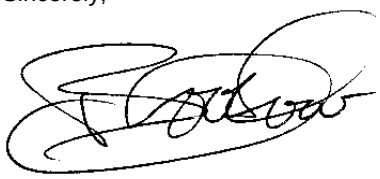
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on June 1, 2020.

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: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
Project: 14-05806-000

Case Narrative

Samples were collected on May 30, 2020 and received by the laboratory on June 1, 2020. 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: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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-20200530**					
Laboratory ID:	06-005-01					
Total Suspended Solids	**110**	5.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**COUMI-20200530**					
Laboratory ID:	06-005-02					
Total Suspended Solids	**53**	2.5	SM 2540D	6-2-20	6-3-20	
Client ID:	**COUMO-20200530**					
Laboratory ID:	06-005-03					
Total Suspended Solids	**32**	2.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**EVAMS-20200530**					
Laboratory ID:	06-005-04					
Total Suspended Solids	**23**	2.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**EVALSS-20200530**					
Laboratory ID:	06-005-05					
Total Suspended Solids	**59**	2.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**MONMN-20200530**					
Laboratory ID:	06-005-06					
Total Suspended Solids	**61**	2.5	SM 2540D	6-2-20	6-3-20	
Client ID:	**MONMS-20200530**					
Laboratory ID:	06-005-07					
Total Suspended Solids	**11**	1.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**MONM-20200530**					
Laboratory ID:	06-005-08					
Total Suspended Solids	**120**	5.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**SEIMN-20200530**					
Laboratory ID:	06-005-09					
Total Suspended Solids	**28**	2.0	SM 2540D	6-2-20	6-3-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	**SEIMS-20200530**					
Laboratory ID:	06-005-10					
Total Suspended Solids	**95**	5.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**TOSMI-20200530**					
Laboratory ID:	06-005-11					
Total Suspended Solids	**34**	1.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**TOSMO-20200530**					
Laboratory ID:	06-005-12					
Total Suspended Solids	**46**	1.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**TYLMI-20200530**					
Laboratory ID:	06-005-13					
Total Suspended Solids	**26**	1.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**TYLMO-20200530**					
Laboratory ID:	06-005-14					
Total Suspended Solids	**7.0**	1.0	SM 2540D	6-2-20	6-3-20	
Client ID:	**QA87-20200530**					
Laboratory ID:	06-005-15					
Total Suspended Solids	**110**	5.0	SM 2540D	6-2-20	6-3-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	MB0602W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	6-2-20	6-3-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-005-10								
	ORIG	DUP							
Total Suspended Solids	**95.0**	**97.0**	NA	NA	NA	NA	2	21	
SPIKE BLANK									
Laboratory ID:	SB0602W1								
	SB		SB		SB				
Total Suspended Solids	**92.0**		100	NA	92	57-126	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20200530**					
Laboratory ID:	06-005-01					
Turbidity	**63**	0.50	EPA 180.1	6-1-20	6-1-20	
Client ID:	**COUMI-20200530**					
Laboratory ID:	06-005-02					
Turbidity	**33**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**COUMO-20200530**					
Laboratory ID:	06-005-03					
Turbidity	**22**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**EVAMS-20200530**					
Laboratory ID:	06-005-04					
Turbidity	**12**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**EVALSS-20200530**					
Laboratory ID:	06-005-05					
Turbidity	**28**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**MONMN-20200530**					
Laboratory ID:	06-005-06					
Turbidity	**39**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**MONMS-20200530**					
Laboratory ID:	06-005-07					
Turbidity	**7.2**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**MONM-20200530**					
Laboratory ID:	06-005-08					
Turbidity	**56**	0.50	EPA 180.1	6-1-20	6-1-20	
Client ID:	**SEIMN-20200530**					
Laboratory ID:	06-005-09					
Turbidity	**11**	0.10	EPA 180.1	6-1-20	6-1-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200530**					
Laboratory ID:	06-005-10					
Turbidity	**52**	0.50	EPA 180.1	6-1-20	6-1-20	
Client ID:	**TOSMI-20200530**					
Laboratory ID:	06-005-11					
Turbidity	**14**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**TOSMO-20200530**					
Laboratory ID:	06-005-12					
Turbidity	**22**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**TYLMI-20200530**					
Laboratory ID:	06-005-13					
Turbidity	**16**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**TYLMO-20200530**					
Laboratory ID:	06-005-14					
Turbidity	**4.6**	0.10	EPA 180.1	6-1-20	6-1-20	
Client ID:	**QA87-20200530**					
Laboratory ID:	06-005-15					
Turbidity	**53**	0.50	EPA 180.1	6-1-20	6-1-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	MB0601W1					
Turbidity	**ND**	0.10	EPA 180.1	6-1-20	6-1-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-005-02								
	ORIG	DUP							
Turbidity	**32.6**	**34.3**	NA	NA	NA	NA	5	14	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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-20200530**					
Laboratory ID:	06-005-01					
Hardness	**29**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**COUMI-20200530**					
Laboratory ID:	06-005-02					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**COUMO-20200530**					
Laboratory ID:	06-005-03					
Hardness	**61**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**EVAMS-20200530**					
Laboratory ID:	06-005-04					
Hardness	**75**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**EVALSS-20200530**					
Laboratory ID:	06-005-05					
Hardness	**73**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**MONMN-20200530**					
Laboratory ID:	06-005-06					
Hardness	**54**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**MONMS-20200530**					
Laboratory ID:	06-005-07					
Hardness	**75**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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-20200530**					
Laboratory ID:	06-005-08					
Hardness	**58**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**SEIMN-20200530**					
Laboratory ID:	06-005-09					
Hardness	**66**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**SEIMS-20200530**					
Laboratory ID:	06-005-10					
Hardness	**39**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**TOSMI-20200530**					
Laboratory ID:	06-005-11					
Hardness	**47**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**TOSMO-20200530**					
Laboratory ID:	06-005-12					
Hardness	**46**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**TYLMI-20200530**					
Laboratory ID:	06-005-13					
Hardness	**48**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	
Client ID:	**TYLMO-20200530**					
Laboratory ID:	06-005-14					
Hardness	**49**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	**QA87-20200530**					
Laboratory ID:	06-005-15					
Hardness	**34**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	MB0606WH3					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	6-6-20	6-8-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-005-01										
	ORIG	DUP									
Hardness	**28.6**	**28.5**	NA		NA	NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	06-005-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**161**	**161**	132	132	28.6	100	100	75-125	0	20	
SPIKE BLANK											
Laboratory ID:	SB0606WH3										
	SB		SB			SB					
Hardness	**133**		132		NA	101		85-115	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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-20200530**					
Laboratory ID:	06-005-01					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**COUMI-20200530**					
Laboratory ID:	06-005-02					
Dissolved Organic Carbon	**10**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**COUMO-20200530**					
Laboratory ID:	06-005-03					
Dissolved Organic Carbon	**8.3**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**EVAMS-20200530**					
Laboratory ID:	06-005-04					
Dissolved Organic Carbon	**8.8**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**EVALSS-20200530**					
Laboratory ID:	06-005-05					
Dissolved Organic Carbon	**8.0**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**MONMN-20200530**					
Laboratory ID:	06-005-06					
Dissolved Organic Carbon	**9.0**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**MONMS-20200530**					
Laboratory ID:	06-005-07					
Dissolved Organic Carbon	**8.2**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**MONM-20200530**					
Laboratory ID:	06-005-08					
Dissolved Organic Carbon	**8.8**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**SEIMN-20200530**					
Laboratory ID:	06-005-09					
Dissolved Organic Carbon	**17**	1.0	SM 5310B	6-3-20	6-3-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
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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:	**SEIMS-20200530**					
Laboratory ID:	06-005-10					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	6-3-20	6-3-20	
Client ID:	**TOSMI-20200530**					
Laboratory ID:	06-005-11					
Dissolved Organic Carbon	**9.3**	1.0	SM 5310B	6-8-20	6-8-20	
Client ID:	**TOSMO-20200530**					
Laboratory ID:	06-005-12					
Dissolved Organic Carbon	**7.3**	1.0	SM 5310B	6-8-20	6-8-20	
Client ID:	**TYLMI-20200530**					
Laboratory ID:	06-005-13					
Dissolved Organic Carbon	**9.6**	1.0	SM 5310B	6-8-20	6-8-20	
Client ID:	**TYLMO-20200530**					
Laboratory ID:	06-005-14					
Dissolved Organic Carbon	**6.5**	1.0	SM 5310B	6-8-20	6-8-20	
Client ID:	**QA87-20200530**					
Laboratory ID:	06-005-15					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	6-3-20	6-3-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	MB0603D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	6-3-20	6-3-20	
Laboratory ID:	MB0608D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	6-8-20	6-8-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-005-09								
	ORIG	DUP							
Dissolved Organic Carbon	**16.6**	**14.9**	NA	NA	NA	NA	11	15	
MATRIX SPIKE									
Laboratory ID:	06-005-09								
	MS		MS		MS				
Dissolved Organic Carbon	**25.9**		10.0	16.6	93	72-132	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0603D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.4**		10.0	NA	114	82-123	NA	NA	
DUPLICATE									
Laboratory ID:	06-005-14								
	ORIG	DUP							
Dissolved Organic Carbon	**6.50**	**6.82**	NA	NA	NA	NA	5	15	
MATRIX SPIKE									
Laboratory ID:	06-005-14								
	MS		MS		MS				
Dissolved Organic Carbon	**17.9**		10.0	6.50	114	72-132	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0608D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.2**		10.0	NA	112	82-123	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
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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-20200530**					
Laboratory ID:	06-005-01					
Total Phosphorus	**0.23**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**COUMI-20200530**					
Laboratory ID:	06-005-02					
Total Phosphorus	**0.19**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**COUMO-20200530**					
Laboratory ID:	06-005-03					
Total Phosphorus	**0.15**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**EVAMS-20200530**					
Laboratory ID:	06-005-04					
Total Phosphorus	**0.075**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**EVALSS-20200530**					
Laboratory ID:	06-005-05					
Total Phosphorus	**0.11**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**MONMN-20200530**					
Laboratory ID:	06-005-06					
Total Phosphorus	**0.21**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**MONMS-20200530**					
Laboratory ID:	06-005-07					
Total Phosphorus	**0.077**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**MONM-20200530**					
Laboratory ID:	06-005-08					
Total Phosphorus	**0.27**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**SEIMN-20200530**					
Laboratory ID:	06-005-09					
Total Phosphorus	**0.061**	0.010	EPA 365.1	6-8-20	6-9-20	

Date of Report: June 10, 2020
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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:	**SEIMS-20200530**					
Laboratory ID:	06-005-10					
Total Phosphorus	**0.21**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**TOSMI-20200530**					
Laboratory ID:	06-005-11					
Total Phosphorus	**0.16**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**TOSMO-20200530**					
Laboratory ID:	06-005-12					
Total Phosphorus	**0.13**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**TYLMI-20200530**					
Laboratory ID:	06-005-13					
Total Phosphorus	**0.11**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**TYLMO-20200530**					
Laboratory ID:	06-005-14					
Total Phosphorus	**0.059**	0.010	EPA 365.1	6-8-20	6-9-20	
Client ID:	**QA87-20200530**					
Laboratory ID:	06-005-15					
Total Phosphorus	**0.20**	0.010	EPA 365.1	6-8-20	6-9-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	MB0608W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	6-8-20	6-9-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-005-01								
	ORIG	DUP							
Total Phosphorus	**0.226**	**0.236**	NA	NA	NA	NA	4	14	
MATRIX SPIKE									
Laboratory ID:	06-005-01								
	MS		MS		MS				
Total Phosphorus	**0.474**		0.250	0.226	99	80-110	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0608W1								
	SB		SB		SB				
Total Phosphorus	**0.248**		0.250	NA	99	78-110	NA	NA	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	**COLM-20200530**					
Laboratory ID:	06-005-01					
Copper	**3.6**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**6.4**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**COUMI-20200530**					
Laboratory ID:	06-005-02					
Copper	**4.1**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**280**	13	EPA 200.8	6-6-20	6-8-20	
Client ID:	**COUMO-20200530**					
Laboratory ID:	06-005-03					
Copper	**4.4**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**62**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**EVAMS-20200530**					
Laboratory ID:	06-005-04					
Copper	**1.3**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**ND**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**EVALSS-20200530**					
Laboratory ID:	06-005-05					
Copper	**2.0**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**ND**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**MONMN-20200530**					
Laboratory ID:	06-005-06					
Copper	**3.3**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**22**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**MONMS-20200530**					
Laboratory ID:	06-005-07					
Copper	**2.1**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**ND**	5.0	EPA 200.8	6-6-20	6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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-20200530**					
Laboratory ID:	06-005-08					
Copper	**4.2**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**42**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**SEIMN-20200530**					
Laboratory ID:	06-005-09					
Copper	**ND**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**ND**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**SEIMS-20200530**					
Laboratory ID:	06-005-10					
Copper	**3.1**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**9.8**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**TOSMI-20200530**					
Laboratory ID:	06-005-11					
Copper	**5.9**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**54**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**TOSMO-20200530**					
Laboratory ID:	06-005-12					
Copper	**4.8**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**43**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**TYLMI-20200530**					
Laboratory ID:	06-005-13					
Copper	**7.2**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**13**	5.0	EPA 200.8	6-6-20	6-8-20	
Client ID:	**TYLMO-20200530**					
Laboratory ID:	06-005-14					
Copper	**4.3**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**17**	5.0	EPA 200.8	6-6-20	6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
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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:	**QA87-20200530**					
Laboratory ID:	06-005-15					
Copper	**2.6**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**7.7**	5.0	EPA 200.8	6-6-20	6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	MB0606WH2					
Copper	**ND**	1.0	EPA 200.8	6-6-20	6-8-20	
Zinc	**ND**	5.0	EPA 200.8	6-6-20	6-8-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-005-04										
	ORIG	DUP									
Copper	**1.25**	**1.19**	NA	NA		NA		NA	5	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	06-005-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**86.8**	**84.2**	100	100	1.25	**86**	**83**	75-125	3	20	
Zinc	**99.2**	**97.4**	100	100	ND	**99**	**97**	75-125	2	20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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-20200530**					
Laboratory ID:	06-005-01					
Copper	**ND**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	
Client ID:	**COUMI-20200530**					
Laboratory ID:	06-005-02					
Copper	**1.8**	1.0	EPA 200.8		6-8-20	
Zinc	**170**	5.0	EPA 200.8		6-8-20	
Client ID:	**COUMO-20200530**					
Laboratory ID:	06-005-03					
Copper	**2.3**	1.0	EPA 200.8		6-8-20	
Zinc	**32**	5.0	EPA 200.8		6-8-20	
Client ID:	**EVAMS-20200530**					
Laboratory ID:	06-005-04					
Copper	**ND**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	
Client ID:	**EVALSS-20200530**					
Laboratory ID:	06-005-05					
Copper	**ND**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	
Client ID:	**MONMN-20200530**					
Laboratory ID:	06-005-06					
Copper	**1.3**	1.0	EPA 200.8		6-8-20	
Zinc	**5.8**	5.0	EPA 200.8		6-8-20	
Client ID:	**MONMS-20200530**					
Laboratory ID:	06-005-07					
Copper	**1.6**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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-20200530**					
Laboratory ID:	06-005-08					
Copper	**1.2**	1.0	EPA 200.8		6-8-20	
Zinc	**6.9**	5.0	EPA 200.8		6-8-20	
Client ID:	**SEIMN-20200530**					
Laboratory ID:	06-005-09					
Copper	**ND**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	
Client ID:	**SEIMS-20200530**					
Laboratory ID:	06-005-10					
Copper	**ND**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	
Client ID:	**TOSMI-20200530**					
Laboratory ID:	06-005-11					
Copper	**4.4**	1.0	EPA 200.8		6-8-20	
Zinc	**31**	5.0	EPA 200.8		6-8-20	
Client ID:	**TOSMO-20200530**					
Laboratory ID:	06-005-12					
Copper	**3.0**	1.0	EPA 200.8		6-8-20	
Zinc	**18**	5.0	EPA 200.8		6-8-20	
Client ID:	**TYLMI-20200530**					
Laboratory ID:	06-005-13					
Copper	**4.2**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	
Client ID:	**TYLMO-20200530**					
Laboratory ID:	06-005-14					
Copper	**3.6**	1.0	EPA 200.8		6-8-20	
Zinc	**14**	5.0	EPA 200.8		6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
Laboratory Reference: 2006-005
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:	**QA87-20200530**					
Laboratory ID:	06-005-15					
Copper	**ND**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	

Date of Report: June 10, 2020
Samples Submitted: June 1, 2020
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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:	MB0608D1					
Copper	**ND**	1.0	EPA 200.8		6-8-20	
Zinc	**ND**	5.0	EPA 200.8		6-8-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-005-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	06-005-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**67.2**	**68.2**	80.0	80.0	ND	**84**	**85**	75-125	1	20	
Zinc	**76.6**	**76.8**	80.0	80.0	ND	**96**	**96**	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

Jun 9 2020
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-20200530	Water	20-A007400	Micro, NUT
COUMI-20200530	Water	20-A007401	Micro, NUT
COUMO-20200530	Water	20-A007402	Micro, NUT
EVAMS-20200530	Water	20-A007403	Micro, NUT
EVALSS-20200530	Water	20-A007404	Micro, NUT
MONMN-20200530	Water	20-A007405	Micro, NUT
MONMS-20200530	Water	20-A007406	Micro, NUT
MONM-20200530	Water	20-A007407	Micro, NUT
SEIMN-20200530	Water	20-A007408	Micro, NUT
SEIMS-20200530	Water	20-A007409	Micro, NUT
TOSMI-20200530	Water	20-A007410	Micro, NUT
TOSMO-20200530	Water	20-A007411	Micro, NUT
TYLMI-20200530	Water	20-A007412	Micro, NUT
TYLMO-20200530	Water	20-A007413	Micro, NUT
QA87-20200530	Water	20-A007414	Micro, NUT

Your samples were received on Monday, June 1, 2020. 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

Jun 9 2020
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: 06-005

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: 06-005
All results reported on an as received basis.

Date Received: 06/01/20
Date Reported: 6/ 9/20

AMTEST Identification Number **20-A007400**
Client Identification **COLM-20200530**
Sampling Date **05/30/20, 18:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2700	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.92	mg/l		0.1			
Total Nitrogen (TKN)	0.747	mg/l		0.2	SM4500N	AY	06/09/20
Total Nitrate + Nitrite	0.17	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007401**
Client Identification **COUMI-20200530**
Sampling Date **05/30/20, 16:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	1.08	mg/l		0.1			
Total Nitrogen (TKN)	0.675	mg/l		0.2	SM4500N	AY	06/09/20
Total Nitrate + Nitrite	0.40	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007402**
Client Identification **COUMO-20200530**
Sampling Date **05/30/20, 15:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2600	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.98	mg/l		0.1			
Total Nitrogen (TKN)	0.647	mg/l		0.2	SM4500N	AY	06/09/20
Total Nitrate + Nitrite	0.33	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007403**
Client Identification **EVAMS-20200530**
Sampling Date **05/30/20, 17:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1300	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	1.72	mg/l		0.1			
Total Nitrogen (TKN)	0.716	mg/l		0.2	SM4500N	AY	06/09/20
Total Nitrate + Nitrite	1.0	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007404**
Client Identification **EVALSS-20200530**
Sampling Date **05/30/20, 17:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	900	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	1.60	mg/l		0.1			
Total Nitrogen (TKN)	0.599	mg/l		0.2	SM4500N	AY	06/09/20
Total Nitrate + Nitrite	1.0	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007405**
Client Identification **MONMN-20200530**
Sampling Date **05/30/20, 18:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.91	mg/l		0.1			
Total Nitrogen (TKN)	0.727	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.18	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007406**
Client Identification **MONMS-20200530**
Sampling Date **05/30/20, 18:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	960	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.84	mg/l		0.1			
Total Nitrogen (TKN)	0.646	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.19	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007407**
Client Identification **MONM-20200530**
Sampling Date **05/30/20, 18:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2100	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.95	mg/l		0.1			
Total Nitrogen (TKN)	0.707	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007408**
Client Identification **SEIMN-20200530**
Sampling Date **05/30/20, 19:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	600	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.75	mg/l		0.1			
Total Nitrogen (TKN)	0.671	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.083	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007409**
Client Identification **SEIMS-20200530**
Sampling Date **05/30/20, 20:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2500	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.98	mg/l		0.1			
Total Nitrogen (TKN)	0.696	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007410**
Client Identification **TOSMI-20200530**
Sampling Date **05/30/20, 16:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	940	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.98	mg/l		0.1			
Total Nitrogen (TKN)	0.588	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.39	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007411**
Client Identification **TOSMO-20200530**
Sampling Date **05/30/20, 16:25**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1600	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.96	mg/l		0.1			
Total Nitrogen (TKN)	0.568	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.39	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007412**
Client Identification **TYLMI-20200530**
Sampling Date **05/30/20, 17:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1500	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	1.04	mg/l		0.1			
Total Nitrogen (TKN)	0.680	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007413**
Client Identification **TYLMO-20200530**
Sampling Date **05/30/20, 16:50**

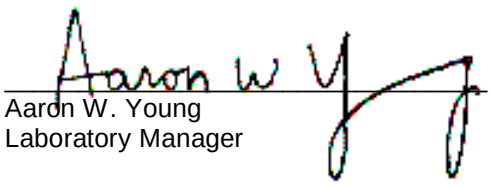
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.98	mg/l		0.1			
Total Nitrogen (TKN)	0.709	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	AY	06/02/20

AMTEST Identification Number **20-A007414**
Client Identification **QA87-20200530**
Sampling Date **05/30/20, 20:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1700	CFU/100 ml		1	SM 9222D	SB	06/01/20
Total Nitrogen (NOX&TKN)	0.96	mg/l		0.1			
Total Nitrogen (TKN)	0.669	mg/l		0.2	SM4500N	AY	06/08/20
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	AY	06/02/20



Aaron W. Young
Laboratory Manager

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

QC Summary for sample numbers: 20-A007400 to 20-A007414

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A007400	Fecal coliform	CFU/100 ml	2700	2500	7.7
20-A007414	Fecal coliform	CFU/100 ml	1700	1800	5.7
20-A006959	Total Nitrogen (TKN)	mg/l	1.05	1.02	2.9
20-A007128	Total Nitrogen (TKN)	mg/l	0.580	0.588	1.4
20-A007282	Total Nitrogen (TKN)	mg/l	0.715	0.714	0.14
20-A007334	Total Nitrogen (TKN)	mg/l	2.09	2.09	0.00
20-A007387	Total Nitrogen (TKN)	mg/l	1.44	1.43	0.70
20-A007414	Total Nitrogen (TKN)	mg/l	0.669	0.668	0.15
20-A007404	Total Nitrogen (TKN)	mg/l	0.599	0.598	0.17
20-A007522	Total Nitrogen (TKN)	mg/l	12.6	12.6	0.00
20-A007587	Total Nitrogen (TKN)	mg/l	0.355	0.365	2.8
20-A007588	Total Nitrogen (TKN)	mg/l	0.231	0.300	26.
20-A007409	Total Nitrate + Nitrite	mg/l	0.28	0.29	3.5
20-A007414	Total Nitrate + Nitrite	mg/l	0.29	0.30	3.4

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A006959	Total Nitrogen (TKN)	mg/l	1.05	2.92	2.00	93.50 %
20-A007128	Total Nitrogen (TKN)	mg/l	0.580	2.62	2.00	102.00 %
20-A007282	Total Nitrogen (TKN)	mg/l	0.715	2.75	2.00	101.75 %
20-A007334	Total Nitrogen (TKN)	mg/l	2.09	4.02	2.00	96.50 %
20-A007387	Total Nitrogen (TKN)	mg/l	1.44	3.34	2.00	95.00 %
20-A007414	Total Nitrogen (TKN)	mg/l	0.669	2.47	2.00	90.05 %
20-A007404	Total Nitrogen (TKN)	mg/l	0.599	2.51	2.00	95.55 %
20-A007522	Total Nitrogen (TKN)	mg/l	12.6	22.1	10.0	95.00 %
20-A007587	Total Nitrogen (TKN)	mg/l	0.355	2.33	2.00	98.75 %
20-A007588	Total Nitrogen (TKN)	mg/l	0.231	2.20	2.00	98.45 %
20-A007409	Total Nitrate + Nitrite	mg/l	0.28	1.3	1.0	102.00 %
20-A007414	Total Nitrate + Nitrite	mg/l	0.29	1.3	1.0	101.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.970	97.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.988	98.8 %
Total Nitrogen (TKN)	mg/l	1.00	0.990	99.0 %
Total Nitrogen (TKN)	mg/l	1.00	0.922	92.2 %
Total Nitrogen (TKN)	mg/l	1.00	0.909	90.9 %
Total Nitrogen (TKN)	mg/l	1.00	0.916	91.6 %

QC Summary for sample numbers: 20-A007400 to 20-A007414...

STANDARD REFERENCE MATERIALS continued....

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.903	90.3 %
Total Nitrogen (TKN)	mg/l	1.00	0.888	88.8 %
Total Nitrogen (TKN)	mg/l	1.00	0.951	95.1 %
Total Nitrogen (TKN)	mg/l	1.00	0.956	95.6 %
Total Nitrate + Nitrite	mg/l	1.0	0.96	96.0 %
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	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
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	< 0.02

OnSite Environmental Inc.

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

Laboratory Reference #: 06-005

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-20200530 7400	5/30/20	18:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200530 01	5/30/20	16:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200530 02	5/30/20	15:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200530 03	5/30/20	17:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200530 04	5/30/20	17:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200530 05	5/30/20	18:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200530 06	5/30/20	18:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200530 07	5/30/20	18:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200530 08	5/30/20	19:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200530 09	5/30/20	20:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time
Relinquished by: Karen Lassen	OSE	6/1/20	1340
Received by:	AMTEST T=4.7	6/1/20	1340
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

pH 3

CLIENT

* RECEIVED SAMPLES OUT OF HOLD.

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 #: 06-005

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-20200530	5/30/20	16:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200530	5/30/20	16:25	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200530	5/30/20	17:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200530	5/30/20	16:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA87-20200530	5/30/20	20:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time
Relinquished by:		OSE	6/1/20	1340
Received by:		AMTEST T=4.7	6/1/20	1340
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

CLIENT

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. 06-005

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-2020 0530	05/30/20	1830	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		1605	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		1540	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		1710	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		1745	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020	1815	1815	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020	1809	1800	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020	1814	1835	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		1910	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		2000	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		1640	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		1625	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020	1715	1715	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020	1650	1650	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 87-		2005	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nick Bartish Date 06/01/20 Received by _____ Date 6/1/20
Firm Herrera Time _____ Firm OSE Time 1230
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. 06-005

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-2020 0530	5/30/20	1830	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		1605	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		1540	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		1710	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		1745	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020	1815	1815	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020	1800	1800	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020	1835	1835	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		1910	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		2000	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		1640	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		1625	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020	1715	1715	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020	1650	1650	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 87-		2005	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nick Bartish Date 06/01/20 Received by _____ Date 6/1/20

Firm Herrera Time _____ Firm OSE Time 1230

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

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

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 5/30/20 **Sample Time:** 1640 PDT: **SITE ID:** TOSMI

Base Flow or Storm Event? **Field Filtered Time:** 1645 PST: **Project Number:** 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp:

Water Quality Sampling

Sample ID: TOSMI-20200530

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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.90

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 102.9

Dissolved Oxygen (mg/L) 10.26

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB BB3

Sample Date: 5.30.20 **Sample Time:** 1625 PDT: X PST:

Base Flow or Storm Event? **Field Filtered Time:** 1635 (Must filter within 15 minutes of collection)

SITE ID: TOSM0

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: drizzling, 54°F

Water Quality Sampling

Sample ID: TOSM1-20200530

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: brownish-gray

Odor: none

Sheen: none

Floatables: susp sed, org deb

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

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) 13.1

Specific Conductivity (µs/cm) ~~10.37~~ 96.3

Dissolved Oxygen (mg/L) 10.37

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: W. Maas

Sample Date: 5/30/20 **Sample Time:** 1710 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1715 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:

Water Quality Sampling

Sample ID: EVAMS-20200530

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: red/brown

Odor: none

Sheen: ↓

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 10th of a foot)

Stream Stage (ft): 3.84

Reference Point (description):

Water Quality Measurments

Temperature (°C) 11.5

Specific Conductivity (µs/cm) 167.1

Dissolved Oxygen (mg/L) 9.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 5/30/20 **Sample Time:** PDT: PST:

Base Flow or Storm Event? **Field Filtered Time:** (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:

Water Quality Sampling

Sample ID: EVALSS-20200530

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, light

Odor: none

Sheen: ↓

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.84

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.3

Specific Conductivity (µs/cm) 156.3

Dissolved Oxygen (mg/L) 11.01

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Barkish

Sample Date: 5/30/20 **Sample Time:** 1830 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1835 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:

Water Quality Sampling

Sample ID: COLM-20200530

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: Floatables:	↓

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 6.13

Reference Point (description): top of bolt

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 56.1

Dissolved Oxygen (mg/L) 10.87

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Moas, N. Barker

Sample Date: 5/30/20 **Sample Time:** 1910 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1915 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp:

Water Quality Sampling

Sample ID: SEMN-20200530

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: red

Odor: none

Sheen: ↓

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 5.76

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.2

Specific Conductivity (µs/cm) 35.7

Dissolved Oxygen (mg/L) 9.90

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel:

Sample Date: **Sample Time:** 2000/2005 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 2005/2010 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:

Water Quality Sampling

Sample ID: SeIMS-20200530

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: QA87-20200530

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: **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): 0.99

Reference Point (description): S 6

Water Quality Measurments

Temperature (°C) 10.7°C

Specific Conductivity (µs/cm) 68.6

Dissolved Oxygen (mg/L) 10.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB & BB

Sample Date: 5.30.20 **Sample Time:** 1540 PDT: X

Base Flow or ~~Storm~~ Event? **Field Filtered Time:** 1550 PST:

(Must filter within 15 minutes of collection)

SITE ID: LOUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: drizzling, 54°F

Water Quality Sampling

Sample ID: LOUMO-20200530

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: light brown

Odor: none

Sheen: none

Floatables: susp sed, debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 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) 13.4

Specific Conductivity (µs/cm) 137.9

Dissolved Oxygen (mg/L) 9.84

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB & BB

Sample Date: 5.30.20 **Sample Time:** 1405 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1615 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: drizzling, 54°F

Water Quality Sampling

Sample ID: COUM1-20200530

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: Slightly cloudy

Color: light brown

Odor: none

Sheen: none

Floatables: suspended org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

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) 12.0

Specific Conductivity (µs/cm) 212.8

Dissolved Oxygen (mg/L) 10.55

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1650 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1700 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, 54°F

Water Quality Sampling

Sample ID: TYLMO-20200530

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: yellowish

Odor: none

Sheen: none

Floatables: suspended

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 2.79

Reference Point (description): top of culvert L

Water Quality Measurments

Temperature (°C) 13.3

Specific Conductivity (µs/cm) 105.7

Dissolved Oxygen (mg/L) 10.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1715 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1725 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: Raining,

Water Quality Sampling

Sample ID: TYLM1-20200530

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 4.36

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 101.3

Dissolved Oxygen (mg/L) 9.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1800 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1810 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: Rain, 54°F

Water Quality Sampling

Sample ID: MONMS-20200530

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: ~~better~~ clear

Color: yellowish

Odor: sewer smell

Sheen: none

Floatables: organic debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 0.49

Reference Point (description): vault

Water Quality Measurments

Temperature (°C) 12.7

Specific Conductivity (µs/cm) 172.1

Dissolved Oxygen (mg/L) 7.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1815 PDT: X

Base Flow or Storm Event? (S) **Field Filtered Time:** 1825 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: Raining, 54°F

Water Quality Sampling

Sample ID: MONMN-20200530

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: NO

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: ~~Pro~~ cloudy

Color: brown

Odor: none

Sheen: none

Floatables: susp sed, org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 1.39

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.5

Specific Conductivity (µs/cm) 110.2

Dissolved Oxygen (mg/L) 9.82

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MONM BB

Sample Date: 5.30.20 **Sample Time:** 1835 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1845 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: Raining, 54°F

Water Quality Sampling

Sample ID: MONM-20200530

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: brown

Color: cloudy

Odor: none

Sheen: none

Floatables: susp sed

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

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) 13.3

Specific Conductivity (µs/cm) 115.1

Dissolved Oxygen (mg/L) 10.42

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. 06-005

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-2020 0530	5/30/20	1830	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		1605	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		1540	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		1710	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		1745	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020	1815	1815	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020	1800	1800	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020	1835	1835	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		1910	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		2000	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		1640	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		1625	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020	1715	1715	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020	1650	1650	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 87-		2005	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nick Bartish Date 06/01/20 Received by _____ Date 6/1/20

Firm Herrera Time _____ Firm OSE Time 1230

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

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

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 5/30/20 **Sample Time:** 1640 PDT: **SITE ID:** TOSMI

Base Flow or Storm Event? **Field Filtered Time:** 1645 PST: **Project Number:** 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp:

Water Quality Sampling

Sample ID: TOSMI-20200530

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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.90

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 102.9

Dissolved Oxygen (mg/L) 10.26

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB BB3

Sample Date: 5.30.20 **Sample Time:** 1625 PDT: X PST:

Base Flow or Storm Event? **Field Filtered Time:** 1635 (Must filter within 15 minutes of collection)

SITE ID: TOSM0

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: drizzling, 54°F

Water Quality Sampling

Sample ID: TOSM1-20200530

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: brownish-gray

Odor: none

Sheen: none

Floatables: susp sed, org deb

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

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) 13.1

Specific Conductivity (µs/cm) ~~10.37~~ 96.3

Dissolved Oxygen (mg/L) 10.37

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: W. Maas

Sample Date: 5/30/20 **Sample Time:** 1710 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1715 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:

Water Quality Sampling

Sample ID: EVAMS-20200530

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: red/brown

Odor: none

Sheen: ↓

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 10th of a foot)

Stream Stage (ft): 3.84

Reference Point (description):

Water Quality Measurments

Temperature (°C) 11.5

Specific Conductivity (µs/cm) 167.1

Dissolved Oxygen (mg/L) 9.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas

Sample Date: 5/30/20 **Sample Time:** PDT: PST:

Base Flow or Storm Event? **Field Filtered Time:** (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:

Water Quality Sampling

Sample ID: EVALSS-20200530

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, light

Odor: none

Sheen: ↓

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.84

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.3

Specific Conductivity (µs/cm) 156.3

Dissolved Oxygen (mg/L) 11.01

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, N. Barkish

Sample Date: 5/30/20 **Sample Time:** 1830 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1835 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:

Water Quality Sampling

Sample ID: COLM-20200530

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: Floatables:	↓

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 6.13

Reference Point (description): top of bolt

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 56.1

Dissolved Oxygen (mg/L) 10.87

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Moas, N. Barker

Sample Date: 5/30/20 **Sample Time:** 1910 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1915 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp:

Water Quality Sampling

Sample ID: SEMN-20200530

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: red

Odor: none

Sheen: ↓

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 5.76

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.2

Specific Conductivity (µs/cm) 35.7

Dissolved Oxygen (mg/L) 9.90

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel:

Sample Date: **Sample Time:** 2000/2005 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 2005/2010 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:

Water Quality Sampling

Sample ID: SeIMS-20200530

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: QA87-20200530

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: **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): 0.99

Reference Point (description): S 6

Water Quality Measurments

Temperature (°C) 10.7°C

Specific Conductivity (µs/cm) 68.6

Dissolved Oxygen (mg/L) 10.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB & BB

Sample Date: 5.30.20 **Sample Time:** 1540 PDT: X

Base Flow or ~~Storm~~ Event? **Field Filtered Time:** 1550 PST:

(Must filter within 15 minutes of collection)

SITE ID: LOUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: drizzling, 54°F

Water Quality Sampling

Sample ID: LOUMO-20200530

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: light brown

Odor: none

Sheen: none

Floatables: susp sed, debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 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) 13.4

Specific Conductivity (µs/cm) 137.9

Dissolved Oxygen (mg/L) 9.84

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB & BB

Sample Date: 5.30.20 **Sample Time:** 1405 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1615 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: drizzling, 54°F

Water Quality Sampling

Sample ID: COUM1-20200530

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: Slightly cloudy

Color: light brown

Odor: none

Sheen: none

Floatables: suspended org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

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) 12.0

Specific Conductivity (µs/cm) 212.8

Dissolved Oxygen (mg/L) 10.55

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1650 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1700 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, 54°F

Water Quality Sampling

Sample ID: TYLMO-20200530

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: yellowish

Odor: none

Sheen: none

Floatables: suspended

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 2.79

Reference Point (description): top of culvert L

Water Quality Measurments

Temperature (°C) 13.3

Specific Conductivity (µs/cm) 105.7

Dissolved Oxygen (mg/L) 10.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1715 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1725 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: Raining,

Water Quality Sampling

Sample ID: TYLM1-20200530

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 4.36

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 101.3

Dissolved Oxygen (mg/L) 9.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1800 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1810 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: Rain, 54°F

Water Quality Sampling

Sample ID: MONMS-20200530

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: ~~better~~ clear

Color: yellowish

Odor: sewer smell

Sheen: none

Floatables: organic debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 0.49

Reference Point (description): vault

Water Quality Measurments

Temperature (°C) 12.7

Specific Conductivity (µs/cm) 172.1

Dissolved Oxygen (mg/L) 7.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 5.30.20 **Sample Time:** 1815 PDT: X

Base Flow or Storm Event? (S) **Field Filtered Time:** 1825 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: Raining, 54°F

Water Quality Sampling

Sample ID: MONMN-20200530

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: NO

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: ~~Pro~~ cloudy

Color: brown

Odor: none

Sheen: none

Floatables: susp sed, org debris

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

Stream Stage Measurement

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

Stream Stage (ft): 1.39

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.5

Specific Conductivity (µs/cm) 110.2

Dissolved Oxygen (mg/L) 9.82

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MONM BB

Sample Date: 5.30.20 **Sample Time:** 1835 PDT: X

Base Flow or Storm Event? **Field Filtered Time:** 1845 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: Raining, 54°F

Water Quality Sampling

Sample ID: MONM-20200530

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: brown

Color: cloudy

Odor: none

Sheen: none

Floatables: susp sed

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 X

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) 13.3

Specific Conductivity (µs/cm) 115.1

Dissolved Oxygen (mg/L) 10.42

Data Quality Assurance Worksheet

By J. Brown

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

Date 7/30/20 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: 5/30/20 /All locations, QA87 (SEIMS) Lab Ref No 2006-005

date 8/14/2020

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**	92	**±20**	2	**≤ 25**	15	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	2	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NA	**±10**	5	**≤ 25**	2	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	9	**≤180**	≤1.0 mg/L 1.0 mg/L	100, 100	**±25**	101	**±15**	0 MS 0	**≤ 20**	14	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	4	**≤28**	≤1.0 mg/L 1.0 mg/L	93, 114	**±25**	114, 112	**±15**	11, 5	**≤ 20**	0	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	10	**≤28**	≤0.01 mg/L 0.01 mg/L	99	**±25**	99	**±20**	4	**≤ 20**	5	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	2, 3	**≤28**	≤0.1 mg/L 0.1 mg/L	90-102	**±25**	89-99	**±20**	0-3, D=0.01-0.07	**≤ 20**	D=0.03, 2	**≤ 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 7/30/20 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: 5/30/20 /All locations, QA87 (SEIMS) Lab Ref No 2006-005

date 8/14/2020

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**	9	**≤180**	≤1.0 µg/L 1.0 µg/L	86, 83	**±25**	NR	**±15**	D=0.06, MS 3	**≤ 20**	D=0.5	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	9	**≤180**	≤5.0 µg/L 5.0 µg/L	99, 97	**±25**	NR	**±15**	NC, MS 2	**≤ 20**	D= 2.1	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	9	**≤180**	≤1.0 µg/L 1.0 µg/L	84, 85	**±25**	NR	**±15**	NC, MS 1	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	9	**≤180**	≤5.0 µg/L 5.0 µg/L	96, 96	**±25**	NR	**±15**	NC, MS 0	**≤ 20**	NC	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	2	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	6, 8	**≤ 35**	38	**≤ 50**	OK	FLAG ALL RESULTS J DUE TO HOLDING TIME 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

July 1, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2006-101

Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on June 9, 2020.

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: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
Project: 14-05806-000

Case Narrative

Samples were collected on June 9, 2020 and received by the laboratory on June 9, 2020. 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: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-01					
Total Suspended Solids	**1.8**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**COUMI-20200609**					
Laboratory ID:	06-101-02					
Total Suspended Solids	**43**	2.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**COUMO-20200609**					
Laboratory ID:	06-101-03					
Total Suspended Solids	**14**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**EVAMS-20200609**					
Laboratory ID:	06-101-04					
Total Suspended Solids	**7.0**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**EVALSS-20200609**					
Laboratory ID:	06-101-05					
Total Suspended Solids	**9.6**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**MONMN-20200609**					
Laboratory ID:	06-101-06					
Total Suspended Solids	**6.8**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**MONMS-20200609**					
Laboratory ID:	06-101-07					
Total Suspended Solids	**2.8**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**MONM-20200609**					
Laboratory ID:	06-101-08					
Total Suspended Solids	**8.0**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**SEIMN-20200609**					
Laboratory ID:	06-101-09					
Total Suspended Solids	**7.4**	1.0	SM 2540D	6-10-20	6-11-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	**SEIMS-20200609**					
Laboratory ID:	06-101-10					
Total Suspended Solids	**12**	2.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**TOSMI-20200609**					
Laboratory ID:	06-101-11					
Total Suspended Solids	**43**	2.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**TOSMO-20200609**					
Laboratory ID:	06-101-12					
Total Suspended Solids	**39**	2.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**TYLMI-20200609**					
Laboratory ID:	06-101-13					
Total Suspended Solids	**5.6**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**TYLMO-20200609**					
Laboratory ID:	06-101-14					
Total Suspended Solids	**10**	1.0	SM 2540D	6-10-20	6-11-20	
Client ID:	**QA88-20200609**					
Laboratory ID:	06-101-15					
Total Suspended Solids	**7.8**	1.0	SM 2540D	6-10-20	6-11-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	MB0610W1					
Total Suspended Solids	**ND**	1.0	SM 2540D	6-10-20	6-11-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-101-12								
	ORIG	DUP							
Total Suspended Solids	**39.2**	**42.0**	NA	NA	NA	NA	7	21	
SPIKE BLANK									
Laboratory ID:	SB0610W1								
	SB		SB		SB				
Total Suspended Solids	**75.0**		100	NA	75	57-126	NA	NA	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20200609**					
Laboratory ID:	06-101-01					
Turbidity	**1.3**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**COUMI-20200609**					
Laboratory ID:	06-101-02					
Turbidity	**15**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**COUMO-20200609**					
Laboratory ID:	06-101-03					
Turbidity	**9.5**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**EVAMS-20200609**					
Laboratory ID:	06-101-04					
Turbidity	**3.9**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**EVALSS-20200609**					
Laboratory ID:	06-101-05					
Turbidity	**4.1**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**MONMN-20200609**					
Laboratory ID:	06-101-06					
Turbidity	**4.7**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**MONMS-20200609**					
Laboratory ID:	06-101-07					
Turbidity	**1.4**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**MONM-20200609**					
Laboratory ID:	06-101-08					
Turbidity	**5.1**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**SEIMN-20200609**					
Laboratory ID:	06-101-09					
Turbidity	**4.8**	0.10	EPA 180.1	6-10-20	6-10-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200609**					
Laboratory ID:	06-101-10					
Turbidity	**6.1**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**TOSMI-20200609**					
Laboratory ID:	06-101-11					
Turbidity	**13**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**TOSMO-20200609**					
Laboratory ID:	06-101-12					
Turbidity	**19**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**TYLMI-20200609**					
Laboratory ID:	06-101-13					
Turbidity	**3.6**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**TYLMO-20200609**					
Laboratory ID:	06-101-14					
Turbidity	**5.3**	0.10	EPA 180.1	6-10-20	6-10-20	
Client ID:	**QA88-20200609**					
Laboratory ID:	06-101-15					
Turbidity	**4.9**	0.10	EPA 180.1	6-10-20	6-10-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	MB0610W1					
Turbidity	**ND**	0.10	EPA 180.1	6-10-20	6-10-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-101-02								
	ORIG	DUP							
Turbidity	**15.4**	**15.1**	NA	NA	NA	NA	2	14	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-01					
Hardness	**12**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**COUMI-20200609**					
Laboratory ID:	06-101-02					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**COUMO-20200609**					
Laboratory ID:	06-101-03					
Hardness	**76**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**EVAMS-20200609**					
Laboratory ID:	06-101-04					
Hardness	**87**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**EVALSS-20200609**					
Laboratory ID:	06-101-05					
Hardness	**83**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**MONMN-20200609**					
Laboratory ID:	06-101-06					
Hardness	**68**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**MONMS-20200609**					
Laboratory ID:	06-101-07					
Hardness	**100**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-08					
Hardness	**77**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**SEIMN-20200609**					
Laboratory ID:	06-101-09					
Hardness	**26**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**SEIMS-20200609**					
Laboratory ID:	06-101-10					
Hardness	**43**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**TOSMI-20200609**					
Laboratory ID:	06-101-11					
Hardness	**45**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**TOSMO-20200609**					
Laboratory ID:	06-101-12					
Hardness	**65**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**TYLMI-20200609**					
Laboratory ID:	06-101-13					
Hardness	**58**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	
Client ID:	**TYLMO-20200609**					
Laboratory ID:	06-101-14					
Hardness	**43**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	**QA88-20200609**					
Laboratory ID:	06-101-15					
Hardness	**76**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	MB0612WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	6-12-20	6-15-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-101-01										
	ORIG	DUP									
Hardness	**12.4**	**12.0**	NA		NA	NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	06-101-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**152**	**147**	132	132	12.4	106	102	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB0612WH1										
	SB		SB			SB					
Hardness	**133**		132		NA	101		85-115	NA	NA	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-01					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**COUMI-20200609**					
Laboratory ID:	06-101-02					
Dissolved Organic Carbon	**4.6**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**COUMO-20200609**					
Laboratory ID:	06-101-03					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**EVAMS-20200609**					
Laboratory ID:	06-101-04					
Dissolved Organic Carbon	**6.0**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**EVALSS-20200609**					
Laboratory ID:	06-101-05					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**MONMN-20200609**					
Laboratory ID:	06-101-06					
Dissolved Organic Carbon	**4.9**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**MONMS-20200609**					
Laboratory ID:	06-101-07					
Dissolved Organic Carbon	**6.1**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**MONM-20200609**					
Laboratory ID:	06-101-08					
Dissolved Organic Carbon	**4.8**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**SEIMN-20200609**					
Laboratory ID:	06-101-09					
Dissolved Organic Carbon	**9.9**	1.0	SM 5310B	6-11-20	6-11-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	**SEIMS-20200609**					
Laboratory ID:	06-101-10					
Dissolved Organic Carbon	**7.8**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**TOSMI-20200609**					
Laboratory ID:	06-101-11					
Dissolved Organic Carbon	**5.7**	1.0	SM 5310B	6-11-20	6-11-20	
Client ID:	**TOSMO-20200609**					
Laboratory ID:	06-101-12					
Dissolved Organic Carbon	**5.8**	1.0	SM 5310B	6-17-20	6-17-20	
Client ID:	**TYLMI-20200609**					
Laboratory ID:	06-101-13					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	6-17-20	6-17-20	
Client ID:	**TYLMO-20200609**					
Laboratory ID:	06-101-14					
Dissolved Organic Carbon	**4.3**	1.0	SM 5310B	6-17-20	6-17-20	
Client ID:	**QA88-20200609**					
Laboratory ID:	06-101-15					
Dissolved Organic Carbon	**5.3**	1.0	SM 5310B	6-17-20	6-17-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	MB0611D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	6-11-20	6-11-20	
Laboratory ID:	MB0617D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	6-17-20	6-17-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-101-04								
	ORIG	DUP							
Dissolved Organic Carbon	**5.99**	**6.23**	NA	NA	NA	NA	4	15	
MATRIX SPIKE									
Laboratory ID:	06-101-04								
	MS		MS		MS				
Dissolved Organic Carbon	**16.1**		10.0	5.99	101	72-132	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0611D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.1**		10.0	NA	101	82-123	NA	NA	
DUPLICATE									
Laboratory ID:	06-101-12								
	ORIG	DUP							
Dissolved Organic Carbon	**5.82**	**5.77**	NA	NA	NA	NA	1	15	
MATRIX SPIKE									
Laboratory ID:	06-101-12								
	MS		MS		MS				
Dissolved Organic Carbon	**16.7**		10.0	5.82	109	72-132	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0617D1								
	SB		SB		SB				
Dissolved Organic Carbon	**11.2**		10.0	NA	112	82-123	NA	NA	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-01					
Total Phosphorus	**0.033**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**COUMI-20200609**					
Laboratory ID:	06-101-02					
Total Phosphorus	**0.17**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**COUMO-20200609**					
Laboratory ID:	06-101-03					
Total Phosphorus	**0.087**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**EVAMS-20200609**					
Laboratory ID:	06-101-04					
Total Phosphorus	**0.055**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**EVALSS-20200609**					
Laboratory ID:	06-101-05					
Total Phosphorus	**0.045**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**MONMN-20200609**					
Laboratory ID:	06-101-06					
Total Phosphorus	**0.051**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**MONMS-20200609**					
Laboratory ID:	06-101-07					
Total Phosphorus	**0.041**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**MONM-20200609**					
Laboratory ID:	06-101-08					
Total Phosphorus	**0.053**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**SEIMN-20200609**					
Laboratory ID:	06-101-09					
Total Phosphorus	**0.052**	0.010	EPA 365.1	6-15-20	6-16-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	**SEIMS-20200609**					
Laboratory ID:	06-101-10					
Total Phosphorus	**0.056**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**TOSMI-20200609**					
Laboratory ID:	06-101-11					
Total Phosphorus	**0.13**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**TOSMO-20200609**					
Laboratory ID:	06-101-12					
Total Phosphorus	**0.11**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**TYLMI-20200609**					
Laboratory ID:	06-101-13					
Total Phosphorus	**0.061**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**TYLMO-20200609**					
Laboratory ID:	06-101-14					
Total Phosphorus	**0.060**	0.010	EPA 365.1	6-15-20	6-16-20	
Client ID:	**QA88-20200609**					
Laboratory ID:	06-101-15					
Total Phosphorus	**0.058**	0.010	EPA 365.1	6-15-20	6-16-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	MB0615W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	6-15-20	6-16-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-101-01								
	ORIG	DUP							
Total Phosphorus	**0.0329**	**0.0326**	NA	NA	NA	NA	1	14	
MATRIX SPIKE									
Laboratory ID:	06-101-01								
	MS		MS		MS				
Total Phosphorus	**0.274**		0.250	0.0329	96	80-110	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0615W1								
	SB		SB		SB				
Total Phosphorus	**0.253**		0.250	NA	101	78-110	NA	NA	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-01					
Copper	**ND**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**COUMI-20200609**					
Laboratory ID:	06-101-02					
Copper	**3.2**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**79**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**COUMO-20200609**					
Laboratory ID:	06-101-03					
Copper	**3.2**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**26**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**EVAMS-20200609**					
Laboratory ID:	06-101-04					
Copper	**ND**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**EVALSS-20200609**					
Laboratory ID:	06-101-05					
Copper	**ND**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**MONMN-20200609**					
Laboratory ID:	06-101-06					
Copper	**1.2**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**5.3**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**MONMS-20200609**					
Laboratory ID:	06-101-07					
Copper	**1.3**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-08					
Copper	**1.2**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**8.1**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**SEIMN-20200609**					
Laboratory ID:	06-101-09					
Copper	**ND**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**SEIMS-20200609**					
Laboratory ID:	06-101-10					
Copper	**ND**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**TOSMI-20200609**					
Laboratory ID:	06-101-11					
Copper	**6.3**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**49**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**TOSMO-20200609**					
Laboratory ID:	06-101-12					
Copper	**5.7**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**42**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**TYLMI-20200609**					
Laboratory ID:	06-101-13					
Copper	**4.6**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	
Client ID:	**TYLMO-20200609**					
Laboratory ID:	06-101-14					
Copper	**5.2**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**19**	5.0	EPA 200.8	6-13-20	6-16-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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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:	**QA88-20200609**					
Laboratory ID:	06-101-15					
Copper	**1.2**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**9.3**	5.0	EPA 200.8	6-13-20	6-16-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	MB0613WH2					
Copper	**ND**	1.0	EPA 200.8	6-13-20	6-16-20	
Zinc	**ND**	5.0	EPA 200.8	6-13-20	6-16-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-101-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	06-101-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**96.0**	**94.6**	100	100	ND	**96**	**95**	75-125	1	20	
Zinc	**102**	**102**	100	100	ND	**102**	**102**	75-125	0	20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-01					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**COUMI-20200609**					
Laboratory ID:	06-101-02					
Copper	**1.4**	1.0	EPA 200.8		6-11-20	
Zinc	**37**	5.0	EPA 200.8		6-11-20	
Client ID:	**COUMO-20200609**					
Laboratory ID:	06-101-03					
Copper	**2.0**	1.0	EPA 200.8		6-11-20	
Zinc	**12**	5.0	EPA 200.8		6-11-20	
Client ID:	**EVAMS-20200609**					
Laboratory ID:	06-101-04					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**EVALSS-20200609**					
Laboratory ID:	06-101-05					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**MONMN-20200609**					
Laboratory ID:	06-101-06					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**MONMS-20200609**					
Laboratory ID:	06-101-07					
Copper	**1.1**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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-20200609**					
Laboratory ID:	06-101-08					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**SEIMN-20200609**					
Laboratory ID:	06-101-09					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**SEIMS-20200609**					
Laboratory ID:	06-101-10					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**TOSMI-20200609**					
Laboratory ID:	06-101-11					
Copper	**3.7**	1.0	EPA 200.8		6-11-20	
Zinc	**18**	5.0	EPA 200.8		6-11-20	
Client ID:	**TOSMO-20200609**					
Laboratory ID:	06-101-12					
Copper	**3.1**	1.0	EPA 200.8		6-11-20	
Zinc	**9.5**	5.0	EPA 200.8		6-11-20	
Client ID:	**TYLMI-20200609**					
Laboratory ID:	06-101-13					
Copper	**3.9**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	
Client ID:	**TYLMO-20200609**					
Laboratory ID:	06-101-14					
Copper	**3.8**	1.0	EPA 200.8		6-11-20	
Zinc	**8.6**	5.0	EPA 200.8		6-11-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	**QA88-20200609**					
Laboratory ID:	06-101-15					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	

Date of Report: July 1, 2020
Samples Submitted: June 9, 2020
Laboratory Reference: 2006-101
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:	MB0611D1					
Copper	**ND**	1.0	EPA 200.8		6-11-20	
Zinc	**ND**	5.0	EPA 200.8		6-11-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-101-15										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	06-101-15										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**70.4**	**73.4**	80.0	80.0	ND	**88**	**92**	75-125	4	20	
Zinc	**79.0**	**82.0**	80.0	80.0	ND	**99**	**103**	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

Jul 1 2020
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-20200609	Water	20-A007919	Micro, NUT
COUMI-20200609	Water	20-A007920	Micro, NUT
COUMO-20200609	Water	20-A007921	Micro, NUT
EVAMS-20200609	Water	20-A007922	Micro, NUT
EVALSS-20200609	Water	20-A007923	Micro, NUT
MONMN-20200609	Water	20-A007924	Micro, NUT
MONMS-20200609	Water	20-A007925	Micro, NUT
MONM-20200609	Water	20-A007926	Micro, NUT
SEIMN-20200609	Water	20-A007927	Micro, NUT
SEIMS-20200609	Water	20-A007928	Micro, NUT
TOSMI-20200609	Water	20-A007929	Micro, NUT
TOSMO-20200609	Water	20-A007930	Micro, NUT
TYLMI-20200609	Water	20-A007931	Micro, NUT
TYLMO-20200609	Water	20-A007932	Micro, NUT
QA88-20200609	Water	20-A007933	Micro, NUT

Your samples were received on Wednesday, June 10, 2020. 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

Jul 1 2020
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: 06-101

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: 06-101
All results reported on an as received basis.

Date Received: 06/10/20
Date Reported: 7/ 1/20

AMTEST Identification Number **20-A007919**
Client Identification **COLM-20200609**
Sampling Date **06/09/20, 12:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	40.	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.10	mg/l		0.1			
Total Nitrogen (TKN)	1.06	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.045	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007920**
Client Identification **COUMI-20200609**
Sampling Date **06/09/20, 10:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	380	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.10	mg/l		0.1			
Total Nitrogen (TKN)	0.834	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007921**
Client Identification **COUMO-20200609**
Sampling Date **06/09/20, 10:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2200	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	0.98	mg/l		0.1			
Total Nitrogen (TKN)	0.744	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007922**
Client Identification **EVAMS-20200609**
Sampling Date **06/09/20, 13:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	130	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	2.03	mg/l		0.1			
Total Nitrogen (TKN)	0.733	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	1.3	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007923**
Client Identification **EVALSS-20200609**
Sampling Date **06/09/20, 13:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.84	mg/l		0.1			
Total Nitrogen (TKN)	0.740	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007924**
Client Identification **MONMN-20200609**
Sampling Date **06/09/20, 11:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	230	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	7.36	mg/l		0.1			
Total Nitrogen (TKN)	7.36	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	< 0.02	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007925**
Client Identification **MONMS-20200609**
Sampling Date **06/09/20, 12:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	88.	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	0.75	mg/l		0.1			
Total Nitrogen (TKN)	0.641	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.11	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007926**
Client Identification **MONM-20200609**
Sampling Date **06/09/20, 13:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	240	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	0.88	mg/l		0.1			
Total Nitrogen (TKN)	0.740	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007927**
Client Identification **SEIMN-20200609**
Sampling Date **06/09/20, 11:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	260	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.03	mg/l		0.1			
Total Nitrogen (TKN)	0.929	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.10	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007928**
Client Identification **SEIMS-20200609**
Sampling Date **06/09/20, 12:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	250	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.18	mg/l		0.1			
Total Nitrogen (TKN)	0.939	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.24	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007929**
Client Identification **TOSMI-20200609**
Sampling Date **06/09/20, 10:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1500	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.14	mg/l		0.1			
Total Nitrogen (TKN)	0.816	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.32	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007930**
Client Identification **TOSMO-20200609**
Sampling Date **06/09/20, 10:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1200	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.19	mg/l		0.1			
Total Nitrogen (TKN)	0.858	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.33	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007931**
Client Identification **TYLMI-20200609**
Sampling Date **06/09/20, 11:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	220	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	1.13	mg/l		0.1			
Total Nitrogen (TKN)	0.819	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.31	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007932**
Client Identification **TYLMO-20200609**
Sampling Date **06/09/20, 11:15**

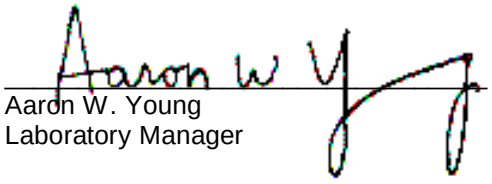
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	240	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	0.85	mg/l		0.1			
Total Nitrogen (TKN)	0.698	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	AY	06/15/20

AMTEST Identification Number **20-A007933**
Client Identification **QA88-20200609**
Sampling Date **06/09/20, 13:05**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	200	CFU/100 ml		1	SM 9222D	JM	06/10/20
Total Nitrogen (NOX&TKN)	0.82	mg/l		0.1			
Total Nitrogen (TKN)	0.685	mg/l		0.2	SM4500N	AY	06/23/20
Total Nitrate + Nitrite	0.14	mg/l		0.02	SM4500NO3	AY	06/15/20



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: 20-A007919 to 20-A007933

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A007919	Fecal coliform	CFU/100 ml	40.	72.	57.
20-A007933	Fecal coliform	CFU/100 ml	200	200	0.00
20-A007905	Total Nitrogen (TKN)	mg/l	3.92	3.88	1.0
20-A007928	Total Nitrogen (TKN)	mg/l	0.939	0.938	0.11
20-A007941	Total Nitrogen (TKN)	mg/l	0.268	0.272	1.5
20-A007990	Total Nitrogen (TKN)	mg/l	0.753	0.831	9.8
20-A008008	Total Nitrogen (TKN)	mg/l	0.636	0.727	13.
20-A007500	Total Nitrate + Nitrite	mg/l	1.8	1.9	5.4
20-A007510	Total Nitrate + Nitrite	mg/l	0.34	0.34	0.00
20-A007742	Total Nitrate + Nitrite	mg/l	0.16	0.18	12.
20-A007819	Total Nitrate + Nitrite	mg/l	0.034	0.034	0.00
20-A007877	Total Nitrate + Nitrite	mg/l	0.44	0.44	0.00
20-A007926	Total Nitrate + Nitrite	mg/l	0.14	0.15	6.9
20-A007990	Total Nitrate + Nitrite	mg/l	0.81	0.80	1.2

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A007905	Total Nitrogen (TKN)	mg/l	3.92	5.98	2.00	103.00 %
20-A007928	Total Nitrogen (TKN)	mg/l	0.939	3.03	2.00	104.55 %
20-A007941	Total Nitrogen (TKN)	mg/l	0.268	2.39	2.00	106.10 %
20-A007990	Total Nitrogen (TKN)	mg/l	0.753	2.85	2.00	104.85 %
20-A008008	Total Nitrogen (TKN)	mg/l	0.636	2.56	2.00	96.20 %
20-A007500	Total Nitrate + Nitrite	mg/l	1.8	2.7	1.0	90.00 %
20-A007510	Total Nitrate + Nitrite	mg/l	0.34	1.3	1.0	96.00 %
20-A007742	Total Nitrate + Nitrite	mg/l	0.16	1.1	1.0	94.00 %
20-A007819	Total Nitrate + Nitrite	mg/l	0.034	0.92	1.0	88.60 %
20-A007877	Total Nitrate + Nitrite	mg/l	0.44	1.3	1.0	86.00 %
20-A007926	Total Nitrate + Nitrite	mg/l	0.14	1.0	1.0	86.00 %
20-A007990	Total Nitrate + Nitrite	mg/l	0.81	1.7	1.0	89.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrogen (TKN)	mg/l	1.00	1.01	101. %
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	0.90	90.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.1	110. %

QC Summary for sample numbers: 20-A007919 to 20-A007933...

STANDARD REFERENCE MATERIALS continued....

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
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	< 0.2
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
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 #: 06-101

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-20200609 7919	6/9/20	12:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200609 20	6/9/20	10:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200609 21	6/9/20	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200609 22	6/9/20	13:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200609 23	6/9/20	13:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200609 24	6/9/20	11:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200609 25	6/9/20	12:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200609 26	6/9/20	13:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200609 27	6/9/20	11:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200609 28	6/9/20	12:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by: Seth Fabo	Onsite Env.	6/9/20	3:15p	EDDs - CSV
Received by:	AmTest	6/10/20	8:00	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

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OnSite Environmental Inc.

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

Laboratory Reference #: 06-101

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-20200609 7929	6/9/20	10:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200609 30	6/9/20	10:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200609 31	6/9/20	11:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200609 32	6/9/20	11:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA88-20200609 33	6/9/20	13:05	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	Onsite Env.	6/9/20	3:15p	EDDs - CSV
Received by: Sothtarb	Amtest	6/10/20	8:00	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

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CHAIN OF CUSTODY

06-101 Page ___of___

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.

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-2020 0609	06/09/20	1230	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		10:40	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		10:20	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		1305	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		1320	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020		11:50	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020		1205	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020		1300	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		11:45	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		1235	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		1045	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		10:50	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020		11:30	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020		11:15	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 88-2020		1305	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Mike Bartlett Date 06/09/20 Received by Nicole Date 6/9/20
Firm Herrera Time 1350 Firm OSE Time 1350
Relinquished by _____ Date _____ Received by _____ Date _____
Firm _____ Time _____ Firm _____ Time _____

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

MM

CHAIN OF CUSTODY

06-101 Page ___of___

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.

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-2020 0609	06/09/20	1230	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2020 ↓	↓	10:40	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2020		10:20	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2020		1305	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2020		1320	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2020		11:50	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2020		1205	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2020		1300	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2020		11:45	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2020		1235	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2020		1045	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2020		10:50	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2020		11:30	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2020		11:15	Water	7	X	X	X	X	X	X	X	X	X			
	QA88-2020		1305	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by [signature] Bartish Date 06/09/20 Received by [signature] Date 6/9/20

Firm Herrera Time 1350 Firm OSE Time 1350

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:	N. Bartid
Meter:	Pro DSS #2
Date/Time:	12:50
Barometric Pressure Start of Day:	mmHg: 769.7 Time: 12:5
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.6	0	22.3	
Conductivity (µS/cm)	982	1,000	22.2	
Conductivity (µS/cm)	99.7	100	22.6	
DO % Saturation	100.2	100	22.2	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	1.5	0	21.9	
Conductivity (µS/cm)	100	100	22.1	
DO % Saturation	95.7	100	22.5	

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. Bartish
Meter:	Pro DSS #1
Date/Time:	12:50
Barometric Pressure Start of Day:	mmHg: 769.3 Time: 12:50
Barometric Pressure End of Day:	mmHg: Time:

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	4.5	0	21.7	
Conductivity (µS/cm)	984	1,000	21.5	
Conductivity (µS/cm)	99.7	100	21.5	
DO % Saturation	100.4	100	21.5	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	0.9	0	22.5	
Conductivity (µS/cm)	100.1	100	22.1	
DO % Saturation	96.9	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.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. W

Sample Date: 06/09/2020 **Sample Time:** 10:45 A.M. PDT:

Base Flow or Storm Event? **Field Filtered Time:** 10:50 A.M 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: Medium Rain

Water Quality Sampling

Sample ID: TOSMI-20200609

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 odor

Sheen: None

Floatables: None

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.95 ft

Reference Point (description):

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 103.9

Dissolved Oxygen (mg/L) 10.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. W

Sample Date: 06-09-2020 **Sample Time:** 11:55 A.M 45 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:50 A.M 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: light rain

Water Quality Sampling

Sample ID: SEIMN-20200609

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 odor
Sheen:	No
Floatables:	No

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 6.5 ft

Reference Point (description):

Water Quality Measurments

Temperature (°C) 10.6

Specific Conductivity (µs/cm) 59.9

Dissolved Oxygen (mg/L) 11.01

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. W

Sample Date: 06/09/2020 **Sample Time:** 12:30 P.M. PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:35 P.M. 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: light rain

Water Quality Sampling

Sample ID: COLM - 20200609

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: **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): 5.71 ft JW ~~3.83 (level below base flood mark)~~ ~~indicates control degrades~~ flow ↓ 23

Reference Point (description):

Water Quality Measurments

Temperature (°C) 11.7

Specific Conductivity (µs/cm) 34.5

Dissolved Oxygen (mg/L) 10.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. W

Sample Date: 06/09/2020 **Sample Time:** 13:05 PDT

Base Flow or Storm Event? **Field Filtered Time:** 13:10 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: Light Rain

Water Quality Sampling

Sample ID: EVAMS - 20200609

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: **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): 3.83 - level elevated but below base flow invert on gage - indicates degradation of control. - will comment KB KB

Reference Point (description):

Water Quality Measurments

Temperature (°C) 11.1

Specific Conductivity (µs/cm) 195.3

Dissolved Oxygen (mg/L) 10.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J. W

Sample Date: 06-09-2020 **Sample Time:** 13:20 PDT:

Base Flow or Storm Event? (Storm Event) **Field Filtered Time:** 13:25 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: Light rain

Water Quality Sampling

Sample ID: EVALSS-20200609

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: **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 ProDSS 1 (circled)
- YSI Pro DSS 2

Stream Stage Measurement

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

Stream Stage (ft): 2.34 ft

Reference Point (description):

Water Quality Measurments

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 186.6

Dissolved Oxygen (mg/L) 11.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. E., M., L.

Sample Date: 06/09/2020 **Sample Time:** 1300 / 1305 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1305 / 1310 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, 60°F

Water Quality Sampling

Sample ID: MONM20200609

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: QA88 20200609

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: ↓

Odor: ↓

Sheen: ↓

Floatables: ↓

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): —

Reference Point (description): —

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 173.9

Dissolved Oxygen (mg/L) 10.44

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. B, M L

Sample Date: 06/09/20 **Sample Time:** 12:35 PDT:

Base Flow or Storm Event? 0 **Field Filtered Time:** 12:45 PST:

(Must filter within 15 minutes of collection)

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Water Quality Sampling

Sample ID: SEIMS20200609

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: Cloudy

Color: slightly brown

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **Signature:**

Date Checked: **Time:**

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

Date Entered: **Time:**

Notes:

Current Weather and Temp:

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): 0.79

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 10.9

Specific Conductivity (µs/cm) 99.1

Dissolved Oxygen (mg/L) 10.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 06/09/2020 **Sample Time:** 12:05 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 12:10 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, Rainy

Water Quality Sampling

Sample ID: MONMS20200609

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:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 7.25

Reference Point (description): Measuring Point

Water Quality Measurments

Temperature (°C) 12.4

Specific Conductivity (µs/cm) 250.5

Dissolved Oxygen (mg/L) 7.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 06/09/20 **Sample Time:** 11:50 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:55 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 Rainy

Water Quality Sampling

Sample ID: MONMN20200609

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:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 1.28

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 13.1

Specific Conductivity (µs/cm) 156.6

Dissolved Oxygen (mg/L) 9.97

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: ND, ML

Sample Date: 06/04/20 **Sample Time:** 11:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:35 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: 58° F

Water Quality Sampling

Sample ID: TYLM120200604

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:

Odor:

Sheen:

Floatables: Small pet debris

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): 4.93

Reference Point (description): Measure down

Water Quality Measurments

Temperature (°C) 12.9

Specific Conductivity (µs/cm) 124.8

Dissolved Oxygen (mg/L) 9.80

Quality Assurance

Checked By: **Signature:**

Date Checked: **Time:**

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

Date Entered: **Time:**

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 06/09/2020 **Sample Time:** 11:15 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:20 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:

Water Quality Sampling

Sample ID: TYLMDL0200609

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:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.67

Reference Point (description): Measuring tape

Water Quality Measurments

Temperature (°C) 13.1

Specific Conductivity (µs/cm) 96.3

Dissolved Oxygen (mg/L) 10.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: VB, ML

Sample Date: 06/09/2020 **Sample Time:** 1050 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1055 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: Rainy, 59°F

Water Quality Sampling

Sample ID: TOSMPD200609

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: Fairly clear

Color: slight brown

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.71

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.4

Specific Conductivity (µs/cm) 140.0

Dissolved Oxygen (mg/L) 10.67

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 06/09/20 **Sample Time:** 10:40 PDT:

Base Flow or Storm Event? Base **Field Filtered Time:** 10:45 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, 60°F

Water Quality Sampling

Sample ID: COUM120200609

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:	
Odor:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.6

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.7

Specific Conductivity (µs/cm) 237.0

Dissolved Oxygen (mg/L) 10.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. B, M. L

Sample Date: 06/09/20 **Sample Time:** 10:20 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 10:25 PST:

(Must filter within 15 minutes of collection)

SITE ID: COMO2020609

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

HERRERA

Current Weather and Temp: 60°F Rainy

Water Quality Sampling

Sample ID: COMO

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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 1.38

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.1

Specific Conductivity (µs/cm) 163.4

Dissolved Oxygen (mg/L) 9.99

Data Quality Assurance Worksheet

By J. Brown

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

Date 7/2/20 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: 6/9/20 /All locations, QA88 (MONM) Lab Ref No 2006-101

date 8/14/2020

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**	75	**±20**	7	**≤ 25**	3	**≤ 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**	6	**≤180**	≤1.0 mg/L 1.0 mg/L	106, 102	**±25**	101	**±15**	3 MS 3	**≤ 20**	1	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	2	**≤28**	≤1.0 mg/L 1.0 mg/L	101, 109	**±25**	101, 112	**±15**	4, 1	**≤ 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	96	**±25**	101	**±20**	D=0.003	**≤ 20**	9	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	6, 14	**≤28**	≤0.1 mg/L 0.1 mg/L	86-106	**±25**	90-110	**±20**	0-13, D=0-0.004	**≤ 20**	0, D=0.06	**≤ 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 7/2/20 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: 6/9/20 /All locations, QA88 (MONM) Lab Ref No 2006-101

date 8/14/2020

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	96, 95	**±25**	NR	**±15**	NC MS 1	**≤ 20**	D=0	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	7	**≤180**	≤5.0 µg/L 5.0 µg/L	102, 102	**±25**	NR	**±15**	NC MS 0	**≤ 20**	D=1.2	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	88, 92	**±25**	NR	**±15**	NC MS 4	**≤ 20**	D=0	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	99, 103	**±25**	NR	**±15**	NC MS 4	**≤ 20**	D=0	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	0, D=32	**≤ 35**	18	**≤ 50**	OK	FLAG COLM J FOR LAB DUPE 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

July 15, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2006-205

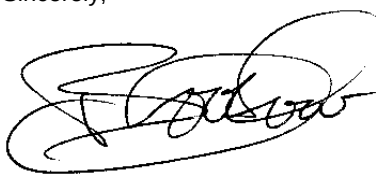
Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on June 18, 2020.

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: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
Project: 14-05806-000

Case Narrative

Samples were collected on June 18, 2020 and received by the laboratory on June 18, 2020. 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: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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-20200618**					
Laboratory ID:	06-205-01					
Total Suspended Solids	**1.4**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**COUMI-20200618**					
Laboratory ID:	06-205-02					
Total Suspended Solids	**20**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**COUMO-20200618**					
Laboratory ID:	06-205-03					
Total Suspended Solids	**7.4**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**EVAMS-20200618**					
Laboratory ID:	06-205-04					
Total Suspended Solids	**7.4**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**EVALSS-20200618**					
Laboratory ID:	06-205-05					
Total Suspended Solids	**6.0**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**MONMN-20200618**					
Laboratory ID:	06-205-06					
Total Suspended Solids	**3.0**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**MONMS-20200618**					
Laboratory ID:	06-205-07					
Total Suspended Solids	**2.8**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**MONM-20200618**					
Laboratory ID:	06-205-08					
Total Suspended Solids	**3.0**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**SEIMN-20200618**					
Laboratory ID:	06-205-09					
Total Suspended Solids	**4.8**	1.0	SM 2540D	6-18-20	6-19-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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:	**SEIMS-20200618**					
Laboratory ID:	06-205-10					
Total Suspended Solids	**6.2**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**TOSMI-20200618**					
Laboratory ID:	06-205-11					
Total Suspended Solids	**16**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**TOSMO-20200618**					
Laboratory ID:	06-205-12					
Total Suspended Solids	**4.2**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**TYLMI-20200618**					
Laboratory ID:	06-205-13					
Total Suspended Solids	**3.4**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**TYLMO-20200618**					
Laboratory ID:	06-205-14					
Total Suspended Solids	**2.6**	1.0	SM 2540D	6-18-20	6-19-20	
Client ID:	**QA89-20200618**					
Laboratory ID:	06-205-16					
Total Suspended Solids	**5.4**	1.0	SM 2540D	6-18-20	6-19-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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:	MB0618W2					
Total Suspended Solids	**ND**	1.0	SM 2540D	6-18-20	6-19-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-205-16								
	ORIG	DUP							
Total Suspended Solids	**5.40**	**5.40**	NA	NA	NA	NA	0	21	
SPIKE BLANK									
Laboratory ID:	SB0618W2								
	SB		SB		SB				
Total Suspended Solids	**103**		100	NA	103	57-126	NA	NA	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20200618**					
Laboratory ID:	06-205-01					
Turbidity	**1.3**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**COUMI-20200618**					
Laboratory ID:	06-205-02					
Turbidity	**8.8**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**COUMO-20200618**					
Laboratory ID:	06-205-03					
Turbidity	**3.9**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**EVAMS-20200618**					
Laboratory ID:	06-205-04					
Turbidity	**3.8**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**EVALSS-20200618**					
Laboratory ID:	06-205-05					
Turbidity	**2.1**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**MONMN-20200618**					
Laboratory ID:	06-205-06					
Turbidity	**1.6**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**MONMS-20200618**					
Laboratory ID:	06-205-07					
Turbidity	**1.1**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**MONM-20200618**					
Laboratory ID:	06-205-08					
Turbidity	**1.8**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**SEIMN-20200618**					
Laboratory ID:	06-205-09					
Turbidity	**1.9**	0.10	EPA 180.1	6-18-20	6-18-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200618**					
Laboratory ID:	06-205-10					
Turbidity	**2.3**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**TOSMI-20200618**					
Laboratory ID:	06-205-11					
Turbidity	**5.1**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**TOSMO-20200618**					
Laboratory ID:	06-205-12					
Turbidity	**2.9**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**TYLMI-20200618**					
Laboratory ID:	06-205-13					
Turbidity	**2.3**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**TYLMO-20200618**					
Laboratory ID:	06-205-14					
Turbidity	**1.8**	0.10	EPA 180.1	6-18-20	6-18-20	
Client ID:	**QA89-20200618**					
Laboratory ID:	06-205-16					
Turbidity	**2.0**	0.10	EPA 180.1	6-18-20	6-18-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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:	MB0618W1					
Turbidity	**ND**	0.10	EPA 180.1	6-18-20	6-18-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-205-11								
	ORIG	DUP							
Turbidity	**5.05**	**5.29**	NA	NA	NA	NA	5	14	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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-20200618**					
Laboratory ID:	06-205-01					
Hardness	**160**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**COUMI-20200618**					
Laboratory ID:	06-205-02					
Hardness	**12**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**COUMO-20200618**					
Laboratory ID:	06-205-03					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**EVAMS-20200618**					
Laboratory ID:	06-205-04					
Hardness	**91**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**EVALSS-20200618**					
Laboratory ID:	06-205-05					
Hardness	**89**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**MONMN-20200618**					
Laboratory ID:	06-205-06					
Hardness	**87**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**MONMS-20200618**					
Laboratory ID:	06-205-07					
Hardness	**130**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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-20200618**					
Laboratory ID:	06-205-08					
Hardness	**93**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**SEIMN-20200618**					
Laboratory ID:	06-205-09					
Hardness	**30**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**SEIMS-20200618**					
Laboratory ID:	06-205-10					
Hardness	**48**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**TOSMI-20200618**					
Laboratory ID:	06-205-11					
Hardness	**67**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**TOSMO-20200618**					
Laboratory ID:	06-205-12					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**TYLMI-20200618**					
Laboratory ID:	06-205-13					
Hardness	**110**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	
Client ID:	**TYLMO-20200618**					
Laboratory ID:	06-205-14					
Hardness	**91**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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:	**QA89-20200618**					
Laboratory ID:	06-205-16					
Hardness	**88**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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:	MB0623WH1					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	6-23-20	6-23-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-205-08										
	ORIG	DUP									
Hardness	**92.9**	**90.4**	NA		NA	NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	06-205-08										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**223**	**222**	132	132	92.9	99	98	75-125	0	20	
SPIKE BLANK											
Laboratory ID:	SB0623WH1										
	SB		SB			SB					
Hardness	**129**		132		NA	98		85-115	NA	NA	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
Laboratory Reference: 2006-205
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-20200618**					
Laboratory ID:	06-205-01					
Dissolved Organic Carbon	**15**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**COUMI-20200618**					
Laboratory ID:	06-205-02					
Dissolved Organic Carbon	**3.3**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**COUMO-20200618**					
Laboratory ID:	06-205-03					
Dissolved Organic Carbon	**2.9**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**EVAMS-20200618**					
Laboratory ID:	06-205-04					
Dissolved Organic Carbon	**3.8**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**EVALSS-20200618**					
Laboratory ID:	06-205-05					
Dissolved Organic Carbon	**3.1**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**MONMN-20200618**					
Laboratory ID:	06-205-06					
Dissolved Organic Carbon	**3.6**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**MONMS-20200618**					
Laboratory ID:	06-205-07					
Dissolved Organic Carbon	**5.6**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**MONM-20200618**					
Laboratory ID:	06-205-08					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**SEIMN-20200618**					
Laboratory ID:	06-205-09					
Dissolved Organic Carbon	**7.8**	1.0	SM 5310B	7-2-20	7-2-20	

Date of Report: July 15, 2020
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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:	**SEIMS-20200618**					
Laboratory ID:	06-205-10					
Dissolved Organic Carbon	**4.1**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**TOSMI-20200618**					
Laboratory ID:	06-205-11					
Dissolved Organic Carbon	**2.8**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**TOSMO-20200618**					
Laboratory ID:	06-205-12					
Dissolved Organic Carbon	**2.6**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**TYLMI-20200618**					
Laboratory ID:	06-205-13					
Dissolved Organic Carbon	**4.4**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**TYLMO-20200618**					
Laboratory ID:	06-205-14					
Dissolved Organic Carbon	**4.0**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**QA90-20200618**					
Laboratory ID:	06-205-15					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	7-2-20	7-2-20	
Client ID:	**QA89-20200618**					
Laboratory ID:	06-205-16					
Dissolved Organic Carbon	**3.3**	1.0	SM 5310B	7-2-20	7-2-20	

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Laboratory Reference: 2006-205
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:	MB0702D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	7-2-20	7-2-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-205-05								
	ORIG	DUP							
Dissolved Organic Carbon	**3.11**	**3.16**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	06-205-05								
	MS		MS		MS				
Dissolved Organic Carbon	**13.1**		10.0	3.11	100	72-132	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0702D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.7**		10.0	NA	107	82-123	NA	NA	

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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-20200618**					
Laboratory ID:	06-205-01					
Total Phosphorus	**0.037**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**COUMI-20200618**					
Laboratory ID:	06-205-02					
Total Phosphorus	**0.13**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**COUMO-20200618**					
Laboratory ID:	06-205-03					
Total Phosphorus	**0.077**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**EVAMS-20200618**					
Laboratory ID:	06-205-04					
Total Phosphorus	**0.036**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**EVALSS-20200618**					
Laboratory ID:	06-205-05					
Total Phosphorus	**0.036**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**MONMN-20200618**					
Laboratory ID:	06-205-06					
Total Phosphorus	**0.053**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**MONMS-20200618**					
Laboratory ID:	06-205-07					
Total Phosphorus	**0.024**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**MONM-20200618**					
Laboratory ID:	06-205-08					
Total Phosphorus	**0.038**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**SEIMN-20200618**					
Laboratory ID:	06-205-09					
Total Phosphorus	**0.038**	0.010	EPA 365.1	6-24-20	6-25-20	

Date of Report: July 15, 2020
Samples Submitted: June 18, 2020
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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:	**SEIMS-20200618**					
Laboratory ID:	06-205-10					
Total Phosphorus	**0.051**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**TOSMI-20200618**					
Laboratory ID:	06-205-11					
Total Phosphorus	**0.091**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**TOSMO-20200618**					
Laboratory ID:	06-205-12					
Total Phosphorus	**0.071**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**TYLMI-20200618**					
Laboratory ID:	06-205-13					
Total Phosphorus	**0.032**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**TYLMO-20200618**					
Laboratory ID:	06-205-14					
Total Phosphorus	**0.058**	0.010	EPA 365.1	6-24-20	6-25-20	
Client ID:	**QA89-20200618**					
Laboratory ID:	06-205-16					
Total Phosphorus	**0.036**	0.010	EPA 365.1	6-24-20	6-25-20	

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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:	MB0624W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	6-24-20	6-25-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	06-205-01								
	ORIG	DUP							
Total Phosphorus	**0.0371**	**0.0241**	NA	NA	NA	NA	42	14	C
MATRIX SPIKE									
Laboratory ID:	06-205-01								
	MS		MS		MS				
Total Phosphorus	**0.252**		0.250	0.0371	86	80-110	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0624W1								
	SB		SB		SB				
Total Phosphorus	**0.234**		0.250	NA	94	78-110	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-20200618**					
Laboratory ID:	06-205-01					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**COUMI-20200618**					
Laboratory ID:	06-205-02					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**39**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**COUMO-20200618**					
Laboratory ID:	06-205-03					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**14**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**EVAMS-20200618**					
Laboratory ID:	06-205-04					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**EVALSS-20200618**					
Laboratory ID:	06-205-05					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**MONMN-20200618**					
Laboratory ID:	06-205-06					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**MONMS-20200618**					
Laboratory ID:	06-205-07					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	

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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-20200618**					
Laboratory ID:	06-205-08					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**6.1**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**SEIMN-20200618**					
Laboratory ID:	06-205-09					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**SEIMS-20200618**					
Laboratory ID:	06-205-10					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**TOSMI-20200618**					
Laboratory ID:	06-205-11					
Copper	**3.3**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**67**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**TOSMO-20200618**					
Laboratory ID:	06-205-12					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**10**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**TYLMI-20200618**					
Laboratory ID:	06-205-13					
Copper	**1.7**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	
Client ID:	**TYLMO-20200618**					
Laboratory ID:	06-205-14					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**7.2**	5.0	EPA 200.8	6-20-20	6-23-20	

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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:	**QA89-20200618**					
Laboratory ID:	06-205-16					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	

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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:	MB0620WH2					
Copper	**ND**	1.0	EPA 200.8	6-20-20	6-23-20	
Zinc	**ND**	5.0	EPA 200.8	6-20-20	6-23-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-205-04										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	06-205-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**94.8**	**91.8**	100	100	ND	**95**	**92**	75-125	3	20	
Zinc	**105**	**103**	100	100	ND	**105**	**103**	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-20200618**					
Laboratory ID:	06-205-01					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**COUMI-20200618**					
Laboratory ID:	06-205-02					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**15**	5.0	EPA 200.8		6-22-20	
Client ID:	**COUMO-20200618**					
Laboratory ID:	06-205-03					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**7.7**	5.0	EPA 200.8		6-22-20	
Client ID:	**EVAMS-20200618**					
Laboratory ID:	06-205-04					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**EVALSS-20200618**					
Laboratory ID:	06-205-05					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**MONMN-20200618**					
Laboratory ID:	06-205-06					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**MONMS-20200618**					
Laboratory ID:	06-205-07					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	

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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:	**MONM-20200618**					
Laboratory ID:	06-205-08					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**5.6**	5.0	EPA 200.8		6-22-20	
Client ID:	**SEIMN-20200618**					
Laboratory ID:	06-205-09					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**SEIMS-20200618**					
Laboratory ID:	06-205-10					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**TOSMI-20200618**					
Laboratory ID:	06-205-11					
Copper	**1.3**	1.0	EPA 200.8		6-22-20	
Zinc	**16**	5.0	EPA 200.8		6-22-20	
Client ID:	**TOSMO-20200618**					
Laboratory ID:	06-205-12					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**7.5**	5.0	EPA 200.8		6-22-20	
Client ID:	**TYLMI-20200618**					
Laboratory ID:	06-205-13					
Copper	**1.3**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**TYLMO-20200618**					
Laboratory ID:	06-205-14					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	

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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:	**QA90-20200618**					
Laboratory ID:	06-205-15					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	
Client ID:	**QA89-20200618**					
Laboratory ID:	06-205-16					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	

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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:	MB0622D1					
Copper	**ND**	1.0	EPA 200.8		6-22-20	
Zinc	**ND**	5.0	EPA 200.8		6-22-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-205-16										
	ORIG	DUP									
Copper	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	06-205-16										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**66.8**	**68.4**	80.0	80.0	ND	**84**	**86**	75-125	2	20	
Zinc	**76.4**	**75.6**	80.0	80.0	ND	**96**	**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

Jul 15 2020
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-20200618	Water	20-A008633	Micro, NUT
COUMI-20200618	Water	20-A008634	Micro, NUT
COUMO-20200618	Water	20-A008635	Micro, NUT
EVAMS-20200618	Water	20-A008636	Micro, NUT
EVALSS-20200618	Water	20-A008637	Micro, NUT
MONMN-20200618	Water	20-A008638	Micro, NUT
MONMS-20200618	Water	20-A008639	Micro, NUT
MONM-20200618	Water	20-A008640	Micro, NUT
SEIMN-20200618	Water	20-A008641	Micro, NUT
SEIMS-20200618	Water	20-A008642	Micro, NUT
TOSMI-20200618	Water	20-A008643	Micro, NUT
TOSMO-20200618	Water	20-A008644	Micro, NUT
TYLMI-20200618	Water	20-A008645	Micro, NUT
TYLMO-20200618	Water	20-A008646	Micro, NUT
QA89-20200618	Water	20-A008647	Micro, NUT

Your samples were received on Thursday, June 18, 2020. 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

Jul 15 2020
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: 06-205

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: 06-205
All results reported on an as received basis.

Date Received: 06/18/20
Date Reported: 7/15/20

AMTEST Identification Number **20-A008633**
Client Identification **COLM-20200618**
Sampling Date **06/18/20, 11:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	25.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.82	mg/l		0.1			
Total Nitrogen (TKN)	0.792	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.029	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008634**
Client Identification **COUMI-20200618**
Sampling Date **06/18/20, 09:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	20.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.79	mg/l		0.1			
Total Nitrogen (TKN)	0.507	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.28	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008635**
Client Identification **COUMO-20200618**
Sampling Date **06/18/20, 09:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	92.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.83	mg/l		0.1			
Total Nitrogen (TKN)	0.473	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.36	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008636**
Client Identification **EVAMS-20200618**
Sampling Date **06/18/20, 10:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	44.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	2.23	mg/l		0.1			
Total Nitrogen (TKN)	0.527	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	1.7	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008637**
Client Identification **EVALSS-20200618**
Sampling Date **06/18/20, 10:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	92.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	1.81	mg/l		0.1			
Total Nitrogen (TKN)	0.511	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	1.3	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008638**
Client Identification **MONMN-20200618**
Sampling Date **06/18/20, 10:50**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	50.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.70	mg/l		0.1			
Total Nitrogen (TKN)	0.549	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008639**
Client Identification **MONMS-20200618**
Sampling Date **06/18/20, 11:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	20.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.638	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.045	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008640**
Client Identification **MONM-20200618**
Sampling Date **06/18/20, 12:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	230	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.77	mg/l		0.1			
Total Nitrogen (TKN)	0.572	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.20	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008641**
Client Identification **SEIMN-20200618**
Sampling Date **06/18/20, 11:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	2.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.68	mg/l		0.1			
Total Nitrogen (TKN)	0.532	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.15	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008642**
Client Identification **SEIMS-20200618**
Sampling Date **06/18/20, 11:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	300	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.80	mg/l		0.1			
Total Nitrogen (TKN)	0.540	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.26	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008643**
Client Identification **TOSMI-20200618**
Sampling Date **06/18/20, 09:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	220	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	1.19	mg/l		0.1			
Total Nitrogen (TKN)	0.459	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.73	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008644**
Client Identification **TOSMO-20200618**
Sampling Date **06/18/20, 09:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	140	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	0.96	mg/l		0.1			
Total Nitrogen (TKN)	0.419	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.54	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008645**
Client Identification **TYLMI-20200618**
Sampling Date **06/18/20, 10:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	320	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	1.51	mg/l		0.1			
Total Nitrogen (TKN)	0.573	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.94	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008646**
Client Identification **TYLMO-20200618**
Sampling Date **06/18/20, 10:15**

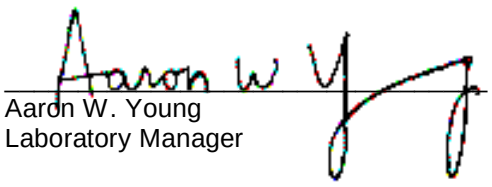
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	310	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	1.05	mg/l		0.1			
Total Nitrogen (TKN)	0.477	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	0.57	mg/l		0.02	SM4500NO3	AY	06/29/20

AMTEST Identification Number **20-A008647**
Client Identification **QA89-20200618**
Sampling Date **06/18/20, 10:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	58.	CFU/100 ml		1	SM 9222D	JM	06/18/20
Total Nitrogen (NOX&TKN)	1.77	mg/l		0.1			
Total Nitrogen (TKN)	0.474	mg/l		0.2	SM4500N	AY	07/02/20
Total Nitrate + Nitrite	1.3	mg/l		0.02	SM4500NO3	AY	06/29/20



Aaron W. Young
Laboratory Manager

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Professional Analytical Services

QC Summary for sample numbers: 20-A008633 to 20-A008647

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A008641	Fecal coliform	CFU/100 ml	2.	2.	0.00
20-A008647	Fecal coliform	CFU/100 ml	58.	64.	9.8
20-A008656	Fecal coliform	CFU/100 ml	150	140	6.9
20-A008019	Total Nitrogen (TKN)	mg/l	0.285	0.221	25.
20-A008309	Total Nitrogen (TKN)	mg/l	5.14	5.21	1.4
20-A008320	Total Nitrogen (TKN)	mg/l	33.1	33.4	0.90
20-A008498	Total Nitrogen (TKN)	mg/l	1.38	1.37	0.73
20-A008636	Total Nitrogen (TKN)	mg/l	0.527	0.529	0.38
20-A008646	Total Nitrogen (TKN)	mg/l	0.477	0.475	0.42
20-A008991	Total Nitrogen (TKN)	mg/l	10.7	10.8	0.93
20-A009109	Total Nitrogen (TKN)	mg/l	1.99	1.97	1.0
20-A008187	Total Nitrate + Nitrite	mg/l	1.9	1.9	0.00
20-A008332	Total Nitrate + Nitrite	mg/l	0.037	0.042	13.
20-A008521	Total Nitrate + Nitrite	mg/l	9.7	10.	3.0
20-A008640	Total Nitrate + Nitrite	mg/l	0.20	0.20	0.00
20-A008723	Total Nitrate + Nitrite	mg/l	0.46	0.49	6.3
20-A008831	Total Nitrate + Nitrite	mg/l	2.1	2.2	4.7
20-A008858	Total Nitrate + Nitrite	mg/l	0.59	0.59	0.00
20-A008925	Total Nitrate + Nitrite	mg/l	0.62	0.64	3.2

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A008019	Total Nitrogen (TKN)	mg/l	0.285	2.43	2.00	107.25 %
20-A008309	Total Nitrogen (TKN)	mg/l	5.14	15.7	10.0	105.60 %
20-A008320	Total Nitrogen (TKN)	mg/l	33.1	53.3	20.0	101.00 %
20-A008498	Total Nitrogen (TKN)	mg/l	1.38	3.56	2.00	109.00 %
20-A008636	Total Nitrogen (TKN)	mg/l	0.527	2.68	2.00	107.65 %
20-A008646	Total Nitrogen (TKN)	mg/l	0.477	2.58	2.00	105.15 %
20-A008991	Total Nitrogen (TKN)	mg/l	10.7	21.0	10.0	103.00 %
20-A009109	Total Nitrogen (TKN)	mg/l	1.99	4.09	2.00	105.00 %
20-A008187	Total Nitrate + Nitrite	mg/l	1.9	3.1	1.0	120.00 %
20-A008332	Total Nitrate + Nitrite	mg/l	0.037	1.1	1.0	106.30 %
20-A008521	Total Nitrate + Nitrite	mg/l	9.7	19.	10.	93.00 %
20-A008640	Total Nitrate + Nitrite	mg/l	0.20	1.2	1.0	100.00 %
20-A008723	Total Nitrate + Nitrite	mg/l	0.46	1.5	1.0	104.00 %
20-A008831	Total Nitrate + Nitrite	mg/l	2.1	3.2	1.0	110.00 %
20-A008858	Total Nitrate + Nitrite	mg/l	0.59	1.5	1.0	91.00 %
20-A008925	Total Nitrate + Nitrite	mg/l	0.62	1.6	1.0	98.00 %

QC Summary for sample numbers: 20-A008633 to 20-A008647...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrogen (TKN)	mg/l	1.00	0.991	99.1 %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	1.04	104. %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrogen (TKN)	mg/l	1.00	1.02	102. %
Total Nitrogen (TKN)	mg/l	1.00	0.986	98.6 %
Total Nitrate + Nitrite	mg/l	1.0	0.98	98.0 %
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
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
Total Nitrogen (TKN)	mg/l	< 0.2
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	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

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

Laboratory Reference #: 06-205

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-20200618 8633	6/18/20	11:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200618 34	6/18/20	9:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200618 35	6/18/20	9:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200618 36	6/18/20	10:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200618 37	6/18/20	10:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200618 38	6/18/20	10:50	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200618 39	6/18/20	11:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200618 40	6/18/20	12:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200618 41	6/18/20	11:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200618 42	6/18/20	11:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

	Signature	Company	Date	Time
Relinquished by:			6/18/20	1425
Received by:		AmTest	6/18/20	1425
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

EDDs - CSV

Reporting Limits:

Fecal Coliform - 1.0 cfu/100ml

Total Nitrogen - .10 mg/L

T=4.4

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OnSite Environmental Inc.

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

Laboratory Reference #: 06-205

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-20200618 8623	6/18/20	9:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200618 44	6/18/20	9:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200618 45	6/18/20	10:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200618 46	6/18/20	10:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA89-20200618 47	6/18/20	10:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	6/18/20	1475	
Received by: Aaron Young	AmTest	6/18/20	1485	**EDDs - CSV**
Relinquished by:				**Reporting Limits:**
Received by:				**Fecal Coliform - 1.0 cfu/100ml**
Relinquished by:				**Total Nitrogen - .10 mg/L**
Received by:				

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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. 06-205

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-2020 0618	06/18/20	1140	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020 0618		0940	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020 0618		0930	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020 0618		1000	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020 0618		1010	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020 0618		1050	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020 0618		1110	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020 0618		1210	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020 0618		1100	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020 0618		1135	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020 0618		0930	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020 0618		0955	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020 0618		1035	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020 0618		1015	Water	7	X	X	X	X	X	X	X	X	X			
15	QA 90-20200618		0950	Water	12	X	X	X	X	X	X	X	X	X			
16	QA89-20200618		1020	Water	27	X	X	X	X	X	X	X	X	X			

Relinquished by Mike Bartish Date 6/18/20 Received by [illegible] Date 6/18/20

Firm Herrera Time 1234 Firm OSE Time 1234

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

1648 NE 95th Street, Redmond, WA 98052
elephone: 425.883.3881

ompany: Herrera Environmental Consultants

roject No.: 14-05806-000

roject Name: Redmond Paired Watershed Study

roject Manager: George Iltner

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

__X__ Standard

Laboratory No. 06-205

Requested Analyses

ab 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-2020 0618	06/18/20	1140	Water	7	X	X	X	X	X	X	X	X	X			
	COUMI-2020 0618		0940	Water	7	X	X	X	X	X	X	X	X	X			
	COUMO-2020 0618		0930	Water	7	X	X	X	X	X	X	X	X	X			
	EVAMS-2020 0618		1000	Water	7	X	X	X	X	X	X	X	X	X			
	EVALSS-2020 0618		1010	Water	7	X	X	X	X	X	X	X	X	X			
	MONMN-2020 0618		1050	Water	7	X	X	X	X	X	X	X	X	X			
	MONMS-2020 0618		1110	Water	7	X	X	X	X	X	X	X	X	X			
	MONM-2020 0618		1210	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMN-2020 0618		1100	Water	7	X	X	X	X	X	X	X	X	X			
	SEIMS-2020 0618		1135	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMI-2020 0618		0930	Water	7	X	X	X	X	X	X	X	X	X			
	TOSMO-2020 0618		0955	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMI-2020 0618		1035	Water	7	X	X	X	X	X	X	X	X	X			
	TYLMO-2020 0618		1015	Water	7	X	X	X	X	X	X	X	X	X			
	QA 90-20200618		0950	Water	7	X	X	X	X	X	X	X	X	X			
	QA89-20200618		1020	Water	2	X	X	X	X	X	X	X	X	X			

elinquished by Zach Bartish Date 6/18/20 Received by VMAlen (UPS) Date 6/18/20

m Herrera Time 1234 Firm OSE Time 1234

elinquished by _____ Date _____ Received by _____ Date _____

m _____ 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:	N. Ekart-sh
Meter:	Pro DSS #2
Date/Time:	06/17/20 1620
Barometric Pressure Start of Day:	mmHg: 771.6 Time: 1620
Barometric Pressure End of Day:	mmHg: 771.4 Time: 1620

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.8	0	22.9	
Conductivity (µS/cm)	1003	1,000	22.8	
Conductivity (µS/cm)	100.9	100	22.1	
DO % Saturation	100.0	100	22.7	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.3	0	23.3	
Conductivity (µS/cm)	100.4	100	23.5	
DO % Saturation	98.4	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:	N. Bartish
Meter:	Pro DSS #1
Date/Time:	06/17/22 1600
Barometric Pressure Start of Day:	mmHg: 771.3 Time: 1600
Barometric Pressure End of Day:	mmHg: 771.2 Time: 1620

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	4.8	0	22.3	
Conductivity (µS/cm)	1005	1,000	22.2	
Conductivity (µS/cm)	101.1	100	22.1	
DO % Saturation	100.6	100	22.1	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	2.1	0	22.6	
Conductivity (µS/cm)	99.3	100	22.6	
DO % Saturation	99.1	100	22.5	

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: NB, GK

Sample Date: 06/18/20 **Sample Time:** 12:10 PDT

Base Flow or Storm Event? **Field Filtered Time:** 12:15 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:

Water Quality Sampling

Sample ID: MONM20200618

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:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 18.0

Specific Conductivity (µs/cm) 219.6

Dissolved Oxygen (mg/L) 10.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. B, G. K

Sample Date: 06/18/20 **Sample Time:** 10:10, 10:20 PDT

Base Flow or Storm Event? **Field Filtered Time:** 10:15, 10:25 PST

(Must filter within 15 minutes of collection)

SITE ID: EVAL55

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny, 60°F

Water Quality Sampling

Sample ID: EVAL552020061 8

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 99 20200618

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.29

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.8

Specific Conductivity (µs/cm) 195.4

Dissolved Oxygen (mg/L) 10.86

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, GK

Sample Date: 06/18/20 **Sample Time:** 11:40 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 11:45 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, 65°F

Water Quality Sampling

Sample ID: COLM20200618

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:

Color:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 5.57

Reference Point (description): S6

Water Quality Measurments

Temperature (°C) 13.9

Specific Conductivity (µs/cm) 56.0

Dissolved Oxygen (mg/L) 9.52

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, GK

Sample Date: 06/18/20 **Sample Time:** 9:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 9:35 PST:

(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, 60°F

Water Quality Sampling

Sample ID: TOSM12020618

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:

Odor:

Sheen: V

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.82

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.6

Specific Conductivity (µs/cm) 292.6

Dissolved Oxygen (mg/L) 10.36

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, JK

Sample Date: 06/18/20 **Sample Time:** 10:00 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 10:05 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: Sunny, 60°F

Water Quality Sampling

Sample ID: EVANS20200618

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:

Odor:

Sheen:

Floatables: bubbles

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.77

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.8

Specific Conductivity (µs/cm) 268.2

Dissolved Oxygen (mg/L) 10.49

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, GK

Sample Date: 06/18/20 **Sample Time:** 11:00 PDT

Base Flow or Storm Event? **Field Filtered Time:** 11:05 PST

(Must filter within 15 minutes of collection)

SITE ID: SEMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny, 65°F

Water Quality Sampling

Sample ID: SEMN20200618

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:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.71

Reference Point (description): Marker Down

Water Quality Measurments

Temperature (°C) 11.9

Specific Conductivity (µs/cm) 70.3

Dissolved Oxygen (mg/L) 10.64

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, M. Lenth

Sample Date: 6/18/20 **Sample Time:** 0955/0950 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1050 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 60°

Water Quality Sampling

Sample ID: TOSMO-20200618

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: QA90-20200618

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.57

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.1

Specific Conductivity (µs/cm) 259.1

Dissolved Oxygen (mg/L) 11.0

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, M. Lemph

Sample Date: 6/18/20 **Sample Time:** 1015 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1020 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: sunny 63°

Water Quality Sampling

Sample ID: TYLMO-20200618

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 35 in

Reference Point (description): top of culvert

Water Quality Measurments

Temperature (°C) 11.8

Specific Conductivity (µs/cm) 209.6

Dissolved Oxygen (mg/L) 10.77

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, M. Lenth

Sample Date: 6/18/20 **Sample Time:** 10:35 PDT

Base Flow or Storm Event? **Field Filtered Time:** 10:40 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: Sunny 66°

Water Quality Sampling

Sample ID: Tylmi 20200618

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 53 in

Reference Point (description): Top of culvert

Water Quality Measurments

Temperature (°C) 12.6

Specific Conductivity (µs/cm) 227.7

Dissolved Oxygen (mg/L) 10.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, M. Lentz

Sample Date: 6/18/20 **Sample Time:** 10:50 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 10:55 PST:

(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:

Water Quality Sampling

Sample ID: MONMN-20200618

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.2

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.6

Specific Conductivity (µs/cm) 198.1

Dissolved Oxygen (mg/L) 7.92

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, M. Lemm

Sample Date: 6/18/20 **Sample Time:** 1110 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1115 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 66°

Water Quality Sampling

Sample ID: MDNMS20200618

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: slight

Sheen: none

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 87.5

Reference Point (description): top of pipe

Water Quality Measurments

Temperature (°C) 12.1

Specific Conductivity (µs/cm) 294.6

Dissolved Oxygen (mg/L) 6.95

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, M. Lenth

Sample Date: 6/19/20 **Sample Time:** 11:35 PDT

Base Flow or Storm Event? **Field Filtered Time:** 1140 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: Sunny 66°

Water Quality Sampling

Sample ID: SEIMS20200618

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 1.75

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.5

Specific Conductivity (µs/cm) 110.2

Dissolved Oxygen (mg/L) 10.47

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Mears, M. Leith

Sample Date: 6/18/20 **Sample Time:** 0930 PDT

Base Flow or Storm Event? **Field Filtered Time:** 0935 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: Sunny 55°

Water Quality Sampling

Sample ID: COUMO - 20200618

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:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.32

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 12.6

Specific Conductivity (µs/cm) 7630

Dissolved Oxygen (mg/L) 10.21

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N. Maas, M. Lenth

Sample Date: 6/18/20 **Sample Time:** 09:40 PDT

Base Flow or Storm Event? **Field Filtered Time:** 0945 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: Sunny 63°

Water Quality Sampling

Sample ID: COUM1-20200618

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: mostly clear

Color: none

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.3

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 11.2

Specific Conductivity (µs/cm) 386.1

Dissolved Oxygen (mg/L) 10.80

Data Quality Assurance Worksheet

By J. Brown

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

Date 8/3/20 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: 6/18/20 /All locations, QA89 (EVALSS) Lab Ref No 2006-205

date 8/14/2020

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**	103	**±20**	0	**≤ 25**	11	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	<1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	5	**≤ 25**	5	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	5	**≤180**	≤1.0 mg/L 1.0 mg/L	99, 98	**±25**	98	**±15**	3 MS <1	**≤ 20**	1	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	14	**≤28**	≤1.0 mg/L 1.0 mg/L	100	**±25**	107	**±15**	2	**≤ 20**	D=0.2	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	7	**≤28**	≤0.01 mg/L 0.01 mg/L	86	**±25**	94	**±20**	D=0.013	**≤ 20**	D=0	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	11, 14	**≤28**	≤0.1 mg/L 0.1 mg/L	91-120	**±25**	0-5 D=0-0.07	**±20**	98-104	**≤ 20**	0, D=0.04	**≤ 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 8/3/20 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: 6/18/20 /All locations, QA89 (EVALSS) Lab Ref No 2006-205

date 8/14/2020

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	95, 92	**±25**	NR	**±15**	NC MS 3	**≤ 20**	NC	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	5	**≤180**	≤5.0 µg/L 5.0 µg/L	105, 103	**±25**	NR	**±15**	NC MS 2	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	4	**≤180**	≤1.0 µg/L 1.0 µg/L	84, 86	**±25**	NR	**±15**	NC MS 2	**≤ 20**	NC	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	4	**≤180**	≤5.0 µg/L 5.0 µg/L	96, 95	**±25**	NR	**±15**	NC MS 1	**≤ 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**	10, 7 D=0	**≤ 35**	45	**≤ 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 9, 2020

Jess Brown
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 2009-252

Dear Jess:

Enclosed are the analytical results and associated quality control data for samples submitted on September 24, 2020.

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 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
Project: 14-05806-000

Case Narrative

Samples were collected on September 23, 2020 and received by the laboratory on September 24, 2020. 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 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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-20200923**					
Laboratory ID:	09-252-01					
Total Suspended Solids	**3.0**	1.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**COUMI-20200923**					
Laboratory ID:	09-252-02					
Total Suspended Solids	**91**	2.5	SM 2540D	9-24-20	9-25-20	
Client ID:	**COUMO-20200923**					
Laboratory ID:	09-252-03					
Total Suspended Solids	**28**	2.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**EVAMS-20200923**					
Laboratory ID:	09-252-04					
Total Suspended Solids	**61**	2.5	SM 2540D	9-24-20	9-25-20	
Client ID:	**EVALSS-20200923**					
Laboratory ID:	09-252-05					
Total Suspended Solids	**110**	2.5	SM 2540D	9-24-20	9-25-20	
Client ID:	**MONMN-20200923**					
Laboratory ID:	09-252-06					
Total Suspended Solids	**120**	2.5	SM 2540D	9-24-20	9-25-20	
Client ID:	**MONMS-20200923**					
Laboratory ID:	09-252-07					
Total Suspended Solids	**3.2**	1.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**MONM-20200923**					
Laboratory ID:	09-252-08					
Total Suspended Solids	**48**	2.5	SM 2540D	9-24-20	9-25-20	
Client ID:	**SEIMN-20200923**					
Laboratory ID:	09-252-09					
Total Suspended Solids	**60**	2.0	SM 2540D	9-24-20	9-25-20	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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:	**SEIMS-20200923**					
Laboratory ID:	09-252-10					
Total Suspended Solids	**66**	5.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**TOSMI-20200923**					
Laboratory ID:	09-252-11					
Total Suspended Solids	**26**	1.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**TOSMO-20200923**					
Laboratory ID:	09-252-12					
Total Suspended Solids	**64**	2.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**TYLMI-20200923**					
Laboratory ID:	09-252-13					
Total Suspended Solids	**28**	2.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**TYLMO-20200923**					
Laboratory ID:	09-252-14					
Total Suspended Solids	**29**	1.0	SM 2540D	9-24-20	9-25-20	
Client ID:	**QA92-20200923**					
Laboratory ID:	09-252-15					
Total Suspended Solids	**25**	2.0	SM 2540D	9-24-20	9-25-20	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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	9-24-20	9-25-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-252-06								
	ORIG	DUP							
Total Suspended Solids	**124**	**112**	NA	NA	NA	NA	10	21	
SPIKE BLANK									
Laboratory ID:	SB0924W2								
	SB		SB		SB				
Total Suspended Solids	**84.0**		100	NA	84	57-126	NA	NA	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLM-20200923**					
Laboratory ID:	09-252-01					
Turbidity	**1.7**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**COUMI-20200923**					
Laboratory ID:	09-252-02					
Turbidity	**44**	0.20	EPA 180.1	9-24-20	9-24-20	
Client ID:	**COUMO-20200923**					
Laboratory ID:	09-252-03					
Turbidity	**16**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**EVAMS-20200923**					
Laboratory ID:	09-252-04					
Turbidity	**32**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**EVALSS-20200923**					
Laboratory ID:	09-252-05					
Turbidity	**45**	0.20	EPA 180.1	9-24-20	9-24-20	
Client ID:	**MONMN-20200923**					
Laboratory ID:	09-252-06					
Turbidity	**50**	0.20	EPA 180.1	9-24-20	9-24-20	
Client ID:	**MONMS-20200923**					
Laboratory ID:	09-252-07					
Turbidity	**2.8**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**MONM-20200923**					
Laboratory ID:	09-252-08					
Turbidity	**21**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**SEIMN-20200923**					
Laboratory ID:	09-252-09					
Turbidity	**39**	0.10	EPA 180.1	9-24-20	9-24-20	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SEIMS-20200923**					
Laboratory ID:	09-252-10					
Turbidity	**27**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**TOSMI-20200923**					
Laboratory ID:	09-252-11					
Turbidity	**9.8**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**TOSMO-20200923**					
Laboratory ID:	09-252-12					
Turbidity	**24**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**TYLMI-20200923**					
Laboratory ID:	09-252-13					
Turbidity	**9.1**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**TYLMO-20200923**					
Laboratory ID:	09-252-14					
Turbidity	**11**	0.10	EPA 180.1	9-24-20	9-24-20	
Client ID:	**QA92-20200923**					
Laboratory ID:	09-252-15					
Turbidity	**11**	0.10	EPA 180.1	9-24-20	9-24-20	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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:	MB0924W1					
Turbidity	**ND**	0.10	EPA 180.1	9-24-20	9-24-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-247-01								
	ORIG	DUP							
Turbidity	**7.10**	**7.16**	NA	NA	NA	NA	1	14	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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-20200923**					
Laboratory ID:	09-252-01					
Hardness	**13**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**COUMI-20200923**					
Laboratory ID:	09-252-02					
Hardness	**88**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**COUMO-20200923**					
Laboratory ID:	09-252-03					
Hardness	**47**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**EVAMS-20200923**					
Laboratory ID:	09-252-04					
Hardness	**91**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**EVALSS-20200923**					
Laboratory ID:	09-252-05					
Hardness	**87**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**MONMN-20200923**					
Laboratory ID:	09-252-06					
Hardness	**55**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**MONMS-20200923**					
Laboratory ID:	09-252-07					
Hardness	**80**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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-20200923**					
Laboratory ID:	09-252-08					
Hardness	**60**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**SEIMN-20200923**					
Laboratory ID:	09-252-09					
Hardness	**42**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**SEIMS-20200923**					
Laboratory ID:	09-252-10					
Hardness	**48**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**TOSMI-20200923**					
Laboratory ID:	09-252-11					
Hardness	**23**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**TOSMO-20200923**					
Laboratory ID:	09-252-12					
Hardness	**45**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**TYLMI-20200923**					
Laboratory ID:	09-252-13					
Hardness	**31**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	
Client ID:	**TYLMO-20200923**					
Laboratory ID:	09-252-14					
Hardness	**29**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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:	**QA92-20200923**					
Laboratory ID:	09-252-15					
Hardness	**29**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	

Date of Report: October 9, 2020
Samples Submitted: September 24, 2020
Laboratory Reference: 2009-252
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:	MB0928WH3					
Hardness	**ND**	1.0	EPA 200.7/SM 2340B	9-28-20	9-29-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-252-01										
	ORIG	DUP									
Hardness	**13.4**	**13.4**	NA		NA	NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-252-01										
	MS	MSD	MS	MSD		MS	MSD				
Hardness	**150**	**148**	132	132	13.4	103	102	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0928WH3										
	SB		SB			SB					
Hardness	**132**		132		NA	100		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-20200923**					
Laboratory ID:	09-252-01					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**COUMI-20200923**					
Laboratory ID:	09-252-02					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**COUMO-20200923**					
Laboratory ID:	09-252-03					
Dissolved Organic Carbon	**8.3**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**EVAMS-20200923**					
Laboratory ID:	09-252-04					
Dissolved Organic Carbon	**11**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**EVALSS-20200923**					
Laboratory ID:	09-252-05					
Dissolved Organic Carbon	**9.2**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**MONMN-20200923**					
Laboratory ID:	09-252-06					
Dissolved Organic Carbon	**9.6**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**MONMS-20200923**					
Laboratory ID:	09-252-07					
Dissolved Organic Carbon	**8.4**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**MONM-20200923**					
Laboratory ID:	09-252-08					
Dissolved Organic Carbon	**8.1**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**SEIMN-20200923**					
Laboratory ID:	09-252-09					
Dissolved Organic Carbon	**7.4**	1.0	SM 5310B	10-1-20	10-1-20	

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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:	**SEIMS-20200923**					
Laboratory ID:	09-252-10					
Dissolved Organic Carbon	**17**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**TOSMI-20200923**					
Laboratory ID:	09-252-11					
Dissolved Organic Carbon	**5.5**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**TOSMO-20200923**					
Laboratory ID:	09-252-12					
Dissolved Organic Carbon	**7.2**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**TYLMI-20200923**					
Laboratory ID:	09-252-13					
Dissolved Organic Carbon	**5.1**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**TYLMO-20200923**					
Laboratory ID:	09-252-14					
Dissolved Organic Carbon	**6.5**	1.0	SM 5310B	10-1-20	10-1-20	
Client ID:	**QA92-20200923**					
Laboratory ID:	09-252-15					
Dissolved Organic Carbon	**6.4**	1.0	SM 5310B	10-1-20	10-1-20	

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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:	MB1001D1					
Dissolved Organic Carbon	**ND**	1.0	SM 5310B	10-1-20	10-1-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-252-01								
	ORIG	DUP							
Dissolved Organic Carbon	**10.6**	**10.8**	NA	NA	NA	NA	2	15	
MATRIX SPIKE									
Laboratory ID:	09-252-01								
	MS		MS		MS				
Dissolved Organic Carbon	**20.9**		10.0	10.6	103	72-132	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB1001D1								
	SB		SB		SB				
Dissolved Organic Carbon	**10.2**		10.0	NA	102	82-123	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-20200923**					
Laboratory ID:	09-252-01					
Total Phosphorus	**0.033**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**COUMI-20200923**					
Laboratory ID:	09-252-02					
Total Phosphorus	**0.25**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**COUMO-20200923**					
Laboratory ID:	09-252-03					
Total Phosphorus	**0.12**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**EVAMS-20200923**					
Laboratory ID:	09-252-04					
Total Phosphorus	**0.12**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**EVALSS-20200923**					
Laboratory ID:	09-252-05					
Total Phosphorus	**0.18**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**MONMN-20200923**					
Laboratory ID:	09-252-06					
Total Phosphorus	**0.34**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**MONMS-20200923**					
Laboratory ID:	09-252-07					
Total Phosphorus	**0.067**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**MONM-20200923**					
Laboratory ID:	09-252-08					
Total Phosphorus	**0.16**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**SEIMN-20200923**					
Laboratory ID:	09-252-09					
Total Phosphorus	**0.20**	0.010	EPA 365.1	9-24-20	9-25-20	

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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:	**SEIMS-20200923**					
Laboratory ID:	09-252-10					
Total Phosphorus	**0.15**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**TOSMI-20200923**					
Laboratory ID:	09-252-11					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**TOSMO-20200923**					
Laboratory ID:	09-252-12					
Total Phosphorus	**0.15**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**TYLMI-20200923**					
Laboratory ID:	09-252-13					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**TYLMO-20200923**					
Laboratory ID:	09-252-14					
Total Phosphorus	**0.10**	0.010	EPA 365.1	9-24-20	9-25-20	
Client ID:	**QA92-20200923**					
Laboratory ID:	09-252-15					
Total Phosphorus	**0.11**	0.010	EPA 365.1	9-24-20	9-25-20	

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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:	MB0924W1					
Total Phosphorus	**ND**	0.010	EPA 365.1	9-24-20	9-25-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-237-01								
	ORIG	DUP							
Total Phosphorus	**0.114**	**0.120**	NA	NA	NA	NA	5	14	
MATRIX SPIKE									
Laboratory ID:	09-237-01								
	MS		MS		MS				
Total Phosphorus	**0.348**		0.250	0.114	94	80-110	NA	NA	
SPIKE BLANK									
Laboratory ID:	SB0924W1								
	SB		SB		SB				
Total Phosphorus	**0.231**		0.250	NA	92	78-110	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-20200923**					
Laboratory ID:	09-252-01					
Copper	**ND**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**ND**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**COUMI-20200923**					
Laboratory ID:	09-252-02					
Copper	**6.2**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**49**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**COUMO-20200923**					
Laboratory ID:	09-252-03					
Copper	**4.4**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**50**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**EVAMS-20200923**					
Laboratory ID:	09-252-04					
Copper	**2.0**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**7.3**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**EVALSS-20200923**					
Laboratory ID:	09-252-05					
Copper	**3.4**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**10**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**MONMN-20200923**					
Laboratory ID:	09-252-06					
Copper	**4.8**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**47**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**MONMS-20200923**					
Laboratory ID:	09-252-07					
Copper	**2.1**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**ND**	5.0	EPA 200.8	9-28-20	9-29-20	

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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-20200923**					
Laboratory ID:	09-252-08					
Copper	**2.8**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**36**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**SEIMN-20200923**					
Laboratory ID:	09-252-09					
Copper	**2.9**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**ND**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**SEIMS-20200923**					
Laboratory ID:	09-252-10					
Copper	**1.9**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**5.4**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**TOSMI-20200923**					
Laboratory ID:	09-252-11					
Copper	**5.3**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**46**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**TOSMO-20200923**					
Laboratory ID:	09-252-12					
Copper	**5.0**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**37**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**TYLMI-20200923**					
Laboratory ID:	09-252-13					
Copper	**8.3**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**36**	5.0	EPA 200.8	9-28-20	9-29-20	
Client ID:	**TYLMO-20200923**					
Laboratory ID:	09-252-14					
Copper	**6.4**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**20**	5.0	EPA 200.8	9-28-20	9-29-20	

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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:	**QA92-20200923**					
Laboratory ID:	09-252-15					
Copper	**6.3**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**21**	5.0	EPA 200.8	9-28-20	9-29-20	

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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:	MB0928WH2					
Copper	**ND**	1.0	EPA 200.8	9-28-20	9-29-20	
Zinc	**ND**	5.0	EPA 200.8	9-28-20	9-29-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-252-04										
	ORIG	DUP									
Copper	**1.97**	**1.97**	NA	NA		NA		NA	0	20	
Zinc	**7.32**	**6.82**	NA	NA		NA		NA	7	20	
MATRIX SPIKES											
Laboratory ID:	09-252-04										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**93.4**	**91.2**	100	100	1.97	**91**	**89**	75-125	2	20	
Zinc	**103**	**102**	100	100	7.32	**96**	**95**	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-20200923**					
Laboratory ID:	09-252-01					
Copper	**ND**	1.0	EPA 200.8		9-25-20	
Zinc	**ND**	5.0	EPA 200.8		9-25-20	
Client ID:	**COUMI-20200923**					
Laboratory ID:	09-252-02					
Copper	**2.8**	1.0	EPA 200.8		9-25-20	
Zinc	**19**	5.0	EPA 200.8		9-25-20	
Client ID:	**COUMO-20200923**					
Laboratory ID:	09-252-03					
Copper	**2.6**	1.0	EPA 200.8		9-25-20	
Zinc	**36**	5.0	EPA 200.8		9-25-20	
Client ID:	**EVAMS-20200923**					
Laboratory ID:	09-252-04					
Copper	**2.0**	1.0	EPA 200.8		9-25-20	
Zinc	**5.3**	5.0	EPA 200.8		9-25-20	
Client ID:	**EVALSS-20200923**					
Laboratory ID:	09-252-05					
Copper	**ND**	1.0	EPA 200.8		9-25-20	
Zinc	**ND**	5.0	EPA 200.8		9-25-20	
Client ID:	**MONMN-20200923**					
Laboratory ID:	09-252-06					
Copper	**1.3**	1.0	EPA 200.8		9-25-20	
Zinc	**9.6**	5.0	EPA 200.8		9-25-20	
Client ID:	**MONMS-20200923**					
Laboratory ID:	09-252-07					
Copper	**1.9**	1.0	EPA 200.8		9-25-20	
Zinc	**ND**	5.0	EPA 200.8		9-25-20	

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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:	**MONM-20200923**					
Laboratory ID:	09-252-08					
Copper	**1.5**	1.0	EPA 200.8		9-25-20	
Zinc	**18**	5.0	EPA 200.8		9-25-20	
Client ID:	**SEIMN-20200923**					
Laboratory ID:	09-252-09					
Copper	**ND**	1.0	EPA 200.8		9-25-20	
Zinc	**ND**	5.0	EPA 200.8		9-25-20	
Client ID:	**SEIMS-20200923**					
Laboratory ID:	09-252-10					
Copper	**ND**	1.0	EPA 200.8		9-25-20	
Zinc	**ND**	5.0	EPA 200.8		9-25-20	
Client ID:	**TOSMI-20200923**					
Laboratory ID:	09-252-11					
Copper	**3.6**	1.0	EPA 200.8		9-25-20	
Zinc	**32**	5.0	EPA 200.8		9-25-20	
Client ID:	**TOSMO-20200923**					
Laboratory ID:	09-252-12					
Copper	**2.8**	1.0	EPA 200.8		9-25-20	
Zinc	**13**	5.0	EPA 200.8		9-25-20	
Client ID:	**TYLMI-20200923**					
Laboratory ID:	09-252-13					
Copper	**5.2**	1.0	EPA 200.8		9-25-20	
Zinc	**11**	5.0	EPA 200.8		9-25-20	
Client ID:	**TYLMO-20200923**					
Laboratory ID:	09-252-14					
Copper	**4.3**	1.0	EPA 200.8		9-25-20	
Zinc	**13**	5.0	EPA 200.8		9-25-20	

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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:	**QA92-20200923**					
Laboratory ID:	09-252-15					
Copper	**4.3**	1.0	EPA 200.8		9-25-20	
Zinc	**13**	5.0	EPA 200.8		9-25-20	

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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:	MB0925D1					
Copper	**ND**	1.0	EPA 200.8		9-25-20	
Zinc	**ND**	5.0	EPA 200.8		9-25-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-252-14										
	ORIG	DUP									
Copper	**4.28**	**4.48**	NA	NA		NA		NA	5	20	
Zinc	**12.7**	**12.6**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-252-14										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**70.6**	**71.2**	80.0	80.0	4.28	**83**	**84**	75-125	1	20	
Zinc	**90.6**	**90.8**	80.0	80.0	12.7	**97**	**98**	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

Oct 14 2020
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-20200923	Water	20-A015367	Micro, NUT
COUMI-20200923	Water	20-A015368	Micro, NUT
COUMO-20200923	Water	20-A015369	Micro, NUT
EVAMS-20200923	Water	20-A015370	Micro, NUT
EVALSS-20200923	Water	20-A015371	Micro, NUT
MONMN-20200923	Water	20-A015372	Micro, NUT
MONMS-20200923	Water	20-A015373	Micro, NUT
MONM-20200923	Water	20-A015374	Micro, NUT
SEIMN-20200923	Water	20-A015375	Micro, NUT
SEIMS-20200923	Water	20-A015376	Micro, NUT
TOSMI-20200923	Water	20-A015377	Micro, NUT
TOSMO-20200923	Water	20-A015378	Micro, NUT
TYLMI-20200923	Water	20-A015379	Micro, NUT
TYLMO-20200923	Water	20-A015380	Micro, NUT
QA92-20200923	Water	20-A015381	Micro, NUT

Your samples were received on Thursday, September 24, 2020. 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).

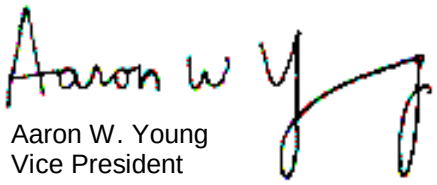
Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Oct 14 2020
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
Vice President

Project #: 14-058106-000
PO Number: 09-252

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 #: 14-058106-000
PO Number: 09-252
All results reported on an as received basis.

Date Received: 09/24/20
Date Reported: 10/14/20

AMTEST Identification Number **20-A015367**
Client Identification **COLM-20200923**
Sampling Date **09/23/20, 19:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	180	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	0.82	mg/l		0.1			
Total Nitrogen (TKN)	0.753	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.072	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015368**
Client Identification **COUMI-20200923**
Sampling Date **09/23/20, 17:10**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	6500	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.88	mg/l		0.1			
Total Nitrogen (TKN)	1.44	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.44	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015369**
Client Identification **COUMO-20200923**
Sampling Date **09/23/20, 17:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4600	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.38	mg/l		0.1			
Total Nitrogen (TKN)	0.919	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.46	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015370**
Client Identification **EVAMS-20200923**
Sampling Date **09/23/20, 17:40**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	3200	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	2.75	mg/l		0.1			
Total Nitrogen (TKN)	1.65	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	1.1	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015371**
Client Identification **EVALSS-20200923**
Sampling Date **09/23/20, 17:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	5000	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	2.80	mg/l		0.1			
Total Nitrogen (TKN)	1.80	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	1.0	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015372**
Client Identification **MONMN-20200923**
Sampling Date **09/23/20, 18:45**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	3000	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	2.12	mg/l		0.1			
Total Nitrogen (TKN)	1.83	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.29	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015373**
Client Identification **MONMS-20200923**
Sampling Date **09/23/20, 19:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	590	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	0.83	mg/l		0.1			
Total Nitrogen (TKN)	0.736	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.097	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015374**
Client Identification **MONM-20200923**
Sampling Date **09/23/20, 19:55**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1300	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.37	mg/l		0.1			
Total Nitrogen (TKN)	1.15	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.22	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015375**
Client Identification **SEIMN-20200923**
Sampling Date **09/23/20, 19:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1000	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.58	mg/l		0.1			
Total Nitrogen (TKN)	1.08	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.50	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015376**
Client Identification **SEIMS-20200923**
Sampling Date **09/23/20, 18:35**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	2.17	mg/l		0.1			
Total Nitrogen (TKN)	1.62	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.55	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015377**
Client Identification **TOSMI-20200923**
Sampling Date **09/23/20, 17:15**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	6200	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.17	mg/l		0.1			
Total Nitrogen (TKN)	0.834	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.34	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015378**
Client Identification **TOSMO-20200923**
Sampling Date **09/23/20, 17:30**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	4000	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.29	mg/l		0.1			
Total Nitrogen (TKN)	0.948	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.34	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015379**
Client Identification **TYLMI-20200923**
Sampling Date **09/23/20, 18:20**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.36	mg/l		0.1			
Total Nitrogen (TKN)	0.939	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.42	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015380**
Client Identification **TYLMO-20200923**
Sampling Date **09/23/20, 17:55**

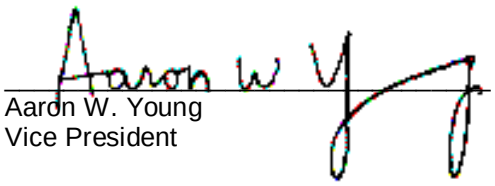
Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1100	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.24	mg/l		0.1			
Total Nitrogen (TKN)	0.966	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	KS	10/01/20

AMTEST Identification Number **20-A015381**
Client Identification **QA92-20200923**
Sampling Date **09/23/20, 18:00**

Results

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal coliform	1400	CFU/100 ml		1	SM 9222D	JM	09/24/20
Total Nitrogen (NOX&TKN)	1.23	mg/l		0.1			
Total Nitrogen (TKN)	0.961	mg/l		0.2	SM4500N	KS	10/02/20
Total Nitrate + Nitrite	0.27	mg/l		0.02	SM4500NO3	KS	10/01/20



Aaron W. Young
Vice President

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(425) 885-1664
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Professional Analytical Services

QC Summary for sample numbers: 20-A015367 to 20-A015381

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
20-A015367	Fecal coliform	CFU/100 ml	180	230	24.
20-A015377	Fecal coliform	CFU/100 ml	6200	4200	38.
20-A015382	Fecal coliform	CFU/100 ml	810	600	30.
20-A015212	Total Nitrogen (TKN)	mg/l	0.588	0.576	2.1
20-A015338	Total Nitrogen (TKN)	mg/l	2.27	2.34	3.0
20-A015370	Total Nitrogen (TKN)	mg/l	1.65	1.69	2.4
20-A015380	Total Nitrogen (TKN)	mg/l	0.939	0.824	13.
20-A015395	Total Nitrogen (TKN)	mg/l	0.778	0.813	4.4
20-A015405	Total Nitrogen (TKN)	mg/l	0.860	0.872	1.4
20-A015415	Total Nitrogen (TKN)	mg/l	0.534	0.501	6.4
20-A015416	Total Nitrogen (TKN)	mg/l	1.22	1.20	1.7
20-A015204	Total Nitrate + Nitrite	mg/l	0.077	0.085	9.9
20-A015214	Total Nitrate + Nitrite	mg/l	0.69	0.69	0.00
20-A015249	Total Nitrate + Nitrite	mg/l	1.7	1.8	5.7
20-A015374	Total Nitrate + Nitrite	mg/l	0.22	0.21	4.7
20-A015440	Total Nitrate + Nitrite	mg/l	3.7	3.9	5.3
20-A015518	Total Nitrate + Nitrite	mg/l	2.4	2.4	0.00
20-A015620	Total Nitrate + Nitrite	mg/l	2.5	2.4	4.1

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
20-A015212	Total Nitrogen (TKN)	mg/l	0.588	2.41	2.00	91.10 %
20-A015338	Total Nitrogen (TKN)	mg/l	2.27	4.45	2.00	109.00 %
20-A015370	Total Nitrogen (TKN)	mg/l	1.65	3.55	2.00	95.00 %
20-A015380	Total Nitrogen (TKN)	mg/l	0.939	2.88	2.00	97.05 %
20-A015395	Total Nitrogen (TKN)	mg/l	0.778	2.69	2.00	95.60 %
20-A015405	Total Nitrogen (TKN)	mg/l	0.860	2.73	2.00	93.50 %
20-A015415	Total Nitrogen (TKN)	mg/l	0.534	2.34	2.00	90.30 %
20-A015416	Total Nitrogen (TKN)	mg/l	1.22	3.29	2.00	103.50 %
20-A015204	Total Nitrate + Nitrite	mg/l	0.077	0.99	1.0	91.30 %
20-A015214	Total Nitrate + Nitrite	mg/l	0.69	1.7	1.0	101.00 %
20-A015249	Total Nitrate + Nitrite	mg/l	1.7	12.	10.	103.00 %
20-A015374	Total Nitrate + Nitrite	mg/l	0.22	1.2	1.0	98.00 %
20-A015440	Total Nitrate + Nitrite	mg/l	3.7	14.	10.	103.00 %
20-A015518	Total Nitrate + Nitrite	mg/l	2.4	3.5	1.0	110.00 %
20-A015620	Total Nitrate + Nitrite	mg/l	2.5	4.5	2.0	100.00 %

QC Summary for sample numbers: 20-A015367 to 20-A015381...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Nitrogen (TKN)	mg/l	1.00	0.981	98.1 %
Total Nitrogen (TKN)	mg/l	1.00	1.01	101. %
Total Nitrogen (TKN)	mg/l	1.00	0.991	99.1 %
Total Nitrate + Nitrite	mg/l	1.0	0.99	99.0 %
Total Nitrate + Nitrite	mg/l	1.0	1.0	100. %
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	< 0.2
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	< 0.02
Total Nitrate + Nitrite	mg/l	< 0.02

OnSite Environmental Inc.

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

Laboratory Reference #: 09-252

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-20200923 15367	9/23/20	19:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
2	COUMI-20200923 68	9/23/20	17:10	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
3	COUMO-20200923 69	9/23/20	17:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
4	EVAMS-20200923 70	9/23/20	17:40	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
5	EVALSS-20200923 71	9/23/20	17:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
6	MONMN-20200923 72	9/23/20	18:45	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
7	MONMS-20200923 73	9/23/20	19:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
8	MONM-20200923 74	9/23/20	19:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
9	SEIMN-20200923 75	9/23/20	19:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
10	SEIMS-20200923 76	9/23/20	18:35	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OnSite Env	9/24/20	1120	**EDDs - CSV**
Received by:	AmTest	9/24/20	1120	**Reporting Limits:**
Relinquished by:				**Fecal Coliform - 1.0 cfu/100ml**
Received by:				**Total Nitrogen - .10 mg/L**
Relinquished by:				
Received by:				

113

Tel Client

OnSite Environmental Inc.

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

Laboratory Reference #: 09-252

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-20200923 15377	9/23/20	17:15	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
12	TOSMO-20200923 78	9/23/20	17:30	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
13	TYLMI-20200923 79	9/23/20	18:20	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
14	TYLMO-20200923 80	9/23/20	17:55	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N
15	QA92-20200923 81	9/23/20	18:00	Water	2	Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N

Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OES Inc Env	9/24/20	1120	EDDs - CSV
Received by:	AmTest	9/24/20	1120	Reporting Limits:
Relinquished by:				Fecal Coliform - 1.0 cfu/100ml
Received by:				Total Nitrogen - .10 mg/L
Relinquished by:				
Received by:				

CHAIN OF CUSTODY

09-252 Page 1 of 1

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.

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-2020-0423	9/23/20	19:20	Water	7	X	X	X	X	X	X	X	X	X			
2	COUMI-2020		17:10	Water	7	X	X	X	X	X	X	X	X	X			
3	COUMO-2020		17:00	Water	7	X	X	X	X	X	X	X	X	X			
4	EVAMS-2020		17:40	Water	7	X	X	X	X	X	X	X	X	X			
5	EVALSS-2020		17:55	Water	7	X	X	X	X	X	X	X	X	X			
6	MONMN-2020		18:45	Water	7	X	X	X	X	X	X	X	X	X			
7	MONMS-2020		19:00	Water	7	X	X	X	X	X	X	X	X	X			
8	MONM-2020		19:55	Water	7	X	X	X	X	X	X	X	X	X			
9	SEIMN-2020		19:30	Water	7	X	X	X	X	X	X	X	X	X			
10	SEIMS-2020		18:50	Water	7	X	X	X	X	X	X	X	X	X			
11	TOSMI-2020		17:15	Water	7	X	X	X	X	X	X	X	X	X			
12	TOSMO-2020		17:30	Water	7	X	X	X	X	X	X	X	X	X			
13	TYLMI-2020		18:20	Water	7	X	X	X	X	X	X	X	X	X			
14	TYLMO-2020		17:55	Water	7	X	X	X	X	X	X	X	X	X			
15	QA-2-COLM-0423		18:00	Water	7	X	X	X	X	X	X	X	X	X			

Relinquished by Nancy Ann O'Connor Date 9/24/20 Received by Nicole Wilson Date 9/24/20

Firm Herrera Time 9:07 Firm OSE Time 907

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

09-252 Page ___ of ___

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 Ilitner

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-2020-092	09/23/20	19:20	Water	7	x	x	x	x	x	x	x	x	x			
	COUMI-2020		17:10	Water	7	x	x	x	x	x	x	x	x	x			
	COUMO-2020		17:00	Water	7	x	x	x	x	x	x	x	x	x			
	EVAMS-2020		17:40	Water	7	x	x	x	x	x	x	x	x	x			
	EVALSS-2020		17:55	Water	7	x	x	x	x	x	x	x	x	x			
	MONMN-2020		18:45	Water	7	x	x	x	x	x	x	x	x	x			
	MONMS-2020		19:00	Water	7	x	x	x	x	x	x	x	x	x			
	MONM-2020		19:55	Water	7	x	x	x	x	x	x	x	x	x			
	[illegible]N		11:30	Water	7	x	x	x	x	x	x	x	x	x			
	[illegible]		18:35	Water	7	x	x	x	x	x	x	x	x	x			
	[illegible]		17:15	Water	7	x	x	x	x	x	x	x	x	x			
	[illegible]O		17:30	Water	7	x	x	x	x	x	x	x	x	x			
	[illegible]		18:20	Water	7	x	x	x	x	x	x	x	x	x			
	[illegible]		17:55	Water	7	x	x	x	x	x	x	x	x	x			
	MP2-COLM-2020	↓	18:00	Water	7	x	x	x	x	x	x	x	x	x			

Relinquished by: [signature] Date 9/24/20 Received by: [signature] Date 9/24/20
Herrera 907 OSE Time 907

Relinquished by: _____ Date _____ Received by: _____ Date _____
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:	N. Bartish
Meter:	Pro DSS #1
Date/Time:	9/28/20 11:50
Barometric Pressure Start of Day:	mmHg: 758.9 Time: 11:30
Barometric Pressure End of Day:	mmHg: 758.8 Time: 12:00

PRE Field Run CALIBRATION	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	3.8	0	22.8	
Conductivity (µS/cm)	978	1,000	22.7	
Conductivity (µS/cm)	101.4	100	22.7	
DO % Saturation	101.2	100	22.7	

POST Field Run CHECK	Meter Reading	Buffer / Cal Std	Temp °C	Comments
Conductivity (µS/cm)	4.5	0	22.0	
Conductivity (µS/cm)	98.5	100	22.3	
DO % Saturation	96.5	100	22.1	

Note: other ProDSS used for sampling was a rental calibrated by Field Environmental

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. Bartish M. Lamb

Sample Date: 09/23/20 **Sample Time:** 17:00 PDT

Base Flow or Storm Event? (C) **Field Filtered Time:** 17:05 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: Rainy, 60°F

Water Quality Sampling

Sample ID: COUMO20200923

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:	
Odor:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 rental
- 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): SG

Water Quality Measurments

Temperature (°C) 16.7

Specific Conductivity (µs/cm) 101.1

Dissolved Oxygen (mg/L) 9.46

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 09/28/20 **Sample Time:** 17:10 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 17:15 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: Rainy, 60°F

Water Quality Sampling

Sample ID: COUM120200923

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 brown, fairly clear
Color:	
Odor:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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

Rented

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) 15.4

Specific Conductivity (µs/cm) 163.5

Dissolved Oxygen (mg/L) 10.00

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 09/22/20 **Sample Time:** 17:55 / 18:00 PDT

Base Flow or Storm Event? **Field Filtered Time:** 18:00 / 18:05 PST

(Must filter within 15 minutes of collection)

SITE ID: TYLM0

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 60°F

Water Quality Sampling

Sample ID: TYLM020200923

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: QA92-20200923

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear

Color: light brown

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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

Rental

Stream Stage Measurement

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

Stream Stage (ft): 2.63

Reference Point (description): Mowed lawn

Water Quality Measurments

Temperature (°C) 16.1

Specific Conductivity (µs/cm) 68.4

Dissolved Oxygen (mg/L) 9.60

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + EB JW

Sample Date: 9/23/20 **Sample Time:** 1955 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1955 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 +60°

Water Quality Sampling

Sample ID: MoNM20200923

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: yellow/brown

Odor: NA

Sheen: NA

Floatables: yes lots

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): NA

Reference Point (description): NA

Water Quality Measurments

Temperature (°C) 15.1

Specific Conductivity (µs/cm) 134.6

Dissolved Oxygen (mg/L) 9.99

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JW + GK

Sample Date: 09/23/20 **Sample Time:** 17:15 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 17:15 PST:

(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 +61°

Water Quality Sampling

Sample ID: TOSM120200923

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 brown

Odor: NA

Sheen: NA

Floatables: yes

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.99

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 16.4

Specific Conductivity (µs/cm) 46.8

Dissolved Oxygen (mg/L) 9.67

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JW + GK

Sample Date: 09/23/20 **Sample Time:** 1740 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1740 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 + 61°

Water Quality Sampling

Sample ID: EVAMS20200923

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 Grain

Odor: NA

Sheen: NA

Floatables: Yes

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 0.88

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.4

Specific Conductivity (µs/cm) 185.3

Dissolved Oxygen (mg/L) 10.03

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JWT GAC

Sample Date: 09/23/2020 **Sample Time:** 1755 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1755 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 +61°

Water Quality Sampling

Sample ID: EVALSS 2020 0923

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: NA

Sheen: NA

Floatables: Yes

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 2.40

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 16.4

Specific Conductivity (µs/cm) 46.8

Dissolved Oxygen (mg/L) 9.67

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JW + Gvk

Sample Date: 09/23/20 **Sample Time:** 1835 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1835 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 20200923

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

Odor: None

Sheen: None

Floatables: None

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 9.00 inches

Reference Point (description): Down from top of bolt

Water Quality Measurments

Temperature (°C) 12.6

Specific Conductivity (µs/cm) 92.6

Dissolved Oxygen (mg/L) 10.28

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: GK + JW

Sample Date: 09/23/20 **Sample Time:** 1920 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1920 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 61°

Water Quality Sampling

Sample ID: COLM20200923

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 yellow brown

Odor: NA

Sheen: NA

Floatables: yes some

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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): 5.44

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 13.8

Specific Conductivity (µs/cm) 40.3

Dissolved Oxygen (mg/L) 8.17

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NT, ML

Sample Date: 09/23/20 **Sample Time:** 19:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 19:35 PST:

(Must filter within 15 minutes of collection)

SITE ID: SELMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 60°F

Water Quality Sampling

Sample ID: SELMN20200923

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:	
Color:	brown tint
Odor:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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

Rental

Stream Stage Measurement

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

Stream Stage (ft): 0.86

Reference Point (description): S 6

Water Quality Measurments

Temperature (°C) 13.9

Specific Conductivity (µs/cm) 94.8

Dissolved Oxygen (mg/L) 9.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 09/28/20 **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: MONMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy, 60°F

Water Quality Sampling

Sample ID: MONMS 2020 0928

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:

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 Rental

YSI Pro DSS 2

Stream Stage Measurement

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

Stream Stage (ft): NA. box was locked

Reference Point (description):

Water Quality Measurments

Temperature (°C) 15.8

Specific Conductivity (µs/cm) 171.8

Dissolved Oxygen (mg/L) 6.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 09/23/20 **Sample Time:** 18:45 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 18:50 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, 60°F

Water Quality Sampling

Sample ID: MONMN20200923

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:

Color: dark color

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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

Rental

Stream Stage Measurement

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

Stream Stage (ft): 9.35

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 15.8

Specific Conductivity (µs/cm) 110.3

Dissolved Oxygen (mg/L) 9.46

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NG, ML

Sample Date: 09/28/20 **Sample Time:** 1820 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 1825 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, 60°F

Water Quality Sampling

Sample ID: TYLM120200928

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:	
Odor:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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

Rental

Stream Stage Measurement

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

Stream Stage (ft): 52.75 inches

Reference Point (description): Measure down

Water Quality Measurments

Temperature (°C) 16.6

Specific Conductivity (µs/cm) 60.5

Dissolved Oxygen (mg/L) 9.51

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: NB, ML

Sample Date: 09/23/20 **Sample Time:** 17:30 PDT:

Base Flow or Storm Event? **Field Filtered Time:** 17:35 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

Water Quality Sampling

Sample ID: TOSMO20200923

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:	
Sheen:	
Floatables:	

LABORATORY DELIVERY

Date: **Time:**

Quality Assurance

Checked By: **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 Rental

Stream Stage Measurement

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

Stream Stage (ft): 0.82

Reference Point (description): SG

Water Quality Measurments

Temperature (°C) 16.2

Specific Conductivity (µs/cm) 86.5

Dissolved Oxygen (mg/L) 10.06

Data Quality Assurance Worksheet

By J. Brown

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

Date 10/12/20 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: 9/23/20 /All locations, QA92 (TYLMO) Lab Ref No 2009-252

date 10/27/2020

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**	84	**±20**	10	**≤ 25**	15	**≤ 25**	OK	NONE
Turbidity	OK / EPA 180.1	NA	**NA**	1	**≤2**	≤0.1 NTU 0.1 NTU	NA	**NA**	NR	**±10**	1	**≤ 25**	0	**≤ 25**	OK	NONE
Hardness	OK / SM 2340B	NA	**NA**	6	**≤180**	≤1.0 mg/L 1.0 mg/L	103, 102	**±25**	100	**±15**	0, MS 1	**≤ 20**	0	**≤ 20**	OK	NONE
DOC	OK / SM 5310B	≤15	**≤15**	8	**≤28**	≤1.0 mg/L 1.0 mg/L	103	**±25**	102	**±15**	2	**≤ 20**	2	**≤ 20**	OK	NONE
Total Phosphorus	OK / EPA 365.1	NA	**NA**	2	**≤28**	≤0.01 mg/L 0.01 mg/L	94	**±25**	92	**±20**	5	**≤ 20**	10	**≤ 20**	OK	NONE
Total Nitrogen (TKN + N+N)	OK/ SM 4500 N-B	NA	**NA**	8,9	**≤28**	≤0.1 mg/L 0.1 mg/L	90-110	**±25**	98-101	**±20**	0-13, D=0.01	**≤ 20**	0, D=0.01	**≤ 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 10/12/20 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: 9/23/20 /All locations, QA92 (TYLMO) Lab Ref No 2009-252

date 10/27/2020

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	91, 89	**±25**	NR	**±15**	D=0, MS 2	**≤ 20**	2	**≤ 20**	OK	NONE
Total Zinc	OK/ EPA 200.8	NA	**NA**	6	**≤180**	≤5.0 µg/L 5.0 µg/L	96, 95	**±25**	NR	**±15**	D=0.5, MS 1	**≤ 20**	D=1	**≤ 20**	OK	NONE
Dissolved Copper	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤1.0 µg/L 1.0 µg/L	83, 84	**±25**	NR	**±15**	D=0.2, MS 1	**≤ 20**	D=0	**≤ 20**	OK	NONE
Dissolved Zinc	OK/ EPA 200.8	≤15	**≤15**	2	**≤180**	≤5.0 µg/L 5.0 µg/L	97, 98	**±25**	NR	**±15**	D=0.1, MS 0	**≤ 20**	D=0	**≤ 20**	OK	NONE
Fecal Coliform	OK / SM 9222D	NA	**NA**	1	**≤1**	≤1.0 cfu/ 100mL 10 cfu/ 100mL	NA	**NA**	NA	**NA**	24-38	**≤ 35**	24	**≤ 50**	OK	NONE, NO FLAG FOR SLIGHT LAB DUPE 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

APPENDIX G

Data Validation Memorandum for Water Quality Monitoring

Herrera Environmental Consultants, Inc.

Internal Memorandum

Date: February 2, 2021

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 243 water samples (including 16 field duplicates, 2 filter blanks, and 1 transfer blank) collected for the Redmond Paired Watershed Stormwater Retrofit Effectiveness Study between October 16, 2019, and September 23, 2020. 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
10/16/19	1910-217	All 14 stations	1 field duplicate
10/29/19	1910-378	All 14 stations	1 field duplicate
11/15/19	1911-151	All 14 stations	1 field duplicate
12/11/19	1912-101	All 14 stations	1 field duplicate
12/19/19	1912-209	All 14 stations	1 field duplicate
1/10/20	2001-122	All 14 stations	1 field duplicate
1/23/20	2001-251	All 14 stations	1 field duplicate
2/05/20	2002-036	All 14 stations	1 field duplicate
2/20/20	2002-200	All 14 stations	1 field duplicate, 1 filter blank, and 1 transfer blank
4/22/20	2004-152	All 14 stations	1 field duplicate
5/21/20	2005-165	All 14 stations	1 field duplicate
5/30/20	2006-005	All 14 stations	1 field duplicate
6/09/20	2006-101	All 14 stations	1 field duplicate
6/18/20	2006-205	All 14 stations	1 field duplicate and 1 filter blank
9/08/20	2009-061	All 14 stations	1 field duplicate
9/23/20	2009-252	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 day for all samples collected on May 30, 2020, 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
5/30/20	2006-005	All locations	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

Filter blanks were collected on February 20, 2020, and June 18, 2020, and analyzed for DOC and dissolved copper and zinc, as required by the QAPP. The filter blanks did not contain levels of target analytes above the laboratory reporting limits.

Transfer Blank Analysis—Acceptable

A transfer blank was collected on February 20, 2020, and analyzed for all parameters, as required by the QAPP. The transfer blank did not contain levels of target analytes above the laboratory reporting limits.

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

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.

Laboratory Duplicate Analysis—Acceptable with Qualification

Laboratory duplicate samples were analyzed for all parameters. For project samples, 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, two laboratory duplicate RPD values did not meet the criteria established in the QAPP. The samples were qualified as estimated (flagged J) due to the laboratory duplicate exceedance.

Date Collected	Lab SDG	Sample Location	Parameter	Reason for Qualification	Flag
12/19/19	1912-209	COLM	Fecal coliform	Laboratory duplicate exceedance	J
1/10/20	2001-122	SEIMS	Fecal coliform	Laboratory duplicate exceedance	J

A laboratory duplicate was analyzed for sample COLM collected on September 8, 2020, for fecal coliform. The RPD between the sample and laboratory duplicate (38 percent) exceeded the less than 35 percent criterion. However, no data were qualified because the exceedance was marginal (3 percent) and all other criteria were met.

A laboratory duplicate was analyzed for sample TOSMI collected on September 23, 2020, for fecal coliform. The RPD between the sample and laboratory duplicate (38 percent) exceeded the less than 35 percent criterion. However, no data were qualified because the exceedance was marginal (3 percent) and all other criteria were met.

Field Duplicate Analysis—Acceptable with Qualification

Field duplicates were analyzed for all parameters at the required frequency (16 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.

The field duplicate collected on April 22, 2020, at station TOSMI (QA85) had an RPD value for total phosphorus (21 percent) that exceeded the less than 20 percent criterion. However, no data were qualified because the exceedance was marginal (1 percent) and all other criteria were met for total phosphorus.

Date Collected	Lab SDG	Sample Location	Duplicate ID	Parameter	Reason for Qualification	Flag
10/29/19	1910-378	MONMS	QA75	TSS and turbidity	Field duplicate exceedance	J
11/15/19	1911-151	COLM	QA76	Turbidity, total nitrogen, and fecal coliform	Field duplicate exceedance	J
4/22/20	2004-152	TOSMI	QA85	Fecal coliform	Field duplicate exceedance	J
9/8/20	2009-061	COUMI	QA91	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	1.4	1.8	4.1	6.6	7.2	4.8	100%	NA
EVAMS	4	1.6	4.5	9.2	11.5	12.0	7.0	100%	NA
MONM	4	0.5	0.5	1.8	21.5	40.0	21.0	50%	NA
MONMN	4	0.5	1.4	2.6	14.5	26.0	13.2	75%	NA
MONMS	4	1.2	2.0	3.4	7.5	11.0	5.5	100%	NA
TOSMO	4	0.5	1.6	3.4	8.1	12.0	6.6	75%	NA
TOSMI	4	2.4	3.1	7.4	13.5	16.0	10.4	100%	NA
COLM	4	0.5	0.8	1.2	22.7	44.0	22.0	75%	NA
SEIMN	4	2.6	3.7	6.7	9.8	11.0	6.1	100%	NA
SEIMS	4	4.0	5.1	7.3	8.6	8.8	3.5	100%	NA
COUMO	4	0.5	1.6	3.2	5.6	7.4	4.1	75%	NA
COUMI	4	3.8	5.0	9.6	16.5	20.0	11.5	100%	NA
TYLMO	4	0.5	1.6	3.3	10.5	17.0	9.0	75%	NA
TYLMI	4	3.2	3.3	18.2	34.5	36.0	31.2	100%	NA
Storm Event Samples									
EVALSS	12	7.0	11.5	42.0	81.0	290.0	69.5	100%	NA
EVAMS	12	3.4	4.6	14.0	26.5	61.0	21.9	100%	NA
MONM	12	1.4	8.4	11.4	41.0	120.0	32.6	100%	NA
MONMN	12	4.2	6.4	8.2	53.5	120.0	47.1	100%	NA
MONMS	12	2.6	3.0	5.1	9.3	11.0	6.3	100%	NA
TOSMO	12	12.0	42.0	55.5	124.0	240.0	82.0	100%	NA
TOSMI	12	23.0	34.0	50.5	89.0	140.0	55.0	100%	NA
COLM	12	0.5	1.2	2.5	10.1	110.0	9.0	75%	NA
SEIMN	12	7.4	18.5	24.5	54.0	220.0	35.5	100%	NA
SEIMS	12	8.6	12.0	14.5	65.5	96.0	53.5	100%	NA
COUMO	12	7.0	15.0	32.0	44.0	97.0	29.0	100%	NA
COUMI	12	26.0	36.0	66.0	140.0	310.0	104.0	100%	NA
TYLMO	12	4.6	8.7	11.0	41.0	60.0	32.3	100%	NA
TYLMI	12	4.6	8.7	15.5	25.0	82.0	16.3	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	1.3	1.4	1.8	2.5	2.9	1.1	100%	NA
EVAMS	4	1.3	2.5	3.7	5.0	6.1	2.5	100%	NA
MONM	4	0.8	0.9	1.4	4.7	7.6	3.8	100%	NA
MONMN	4	1.4	1.5	1.6	9.3	17.0	7.8	100%	NA
MONMS	4	1.1	1.1	1.2	2.5	3.8	1.4	100%	NA
TOSMO	4	1.0	1.2	2.1	3.2	3.5	2.1	100%	NA
TOSMI	4	1.1	1.5	2.1	3.7	5.1	2.3	100%	NA
COLM	4	0.7	1.0	1.4	7.8	14.0	6.8	100%	NA
SEIMN	4	1.5	1.7	2.8	3.7	3.7	2.0	100%	NA
SEIMS	4	1.8	2.0	2.3	3.1	3.8	1.1	100%	NA
COUMO	4	0.9	1.2	1.9	3.1	3.9	1.8	100%	NA
COUMI	4	2.3	2.8	5.0	7.8	8.8	5.0	100%	NA
TYLMO	4	1.7	1.8	1.8	3.4	4.9	1.6	100%	NA
TYLMI	4	1.8	2.1	5.0	8.0	8.4	6.0	100%	NA
Storm Event Samples									
EVALSS	12	3.8	4.9	18.5	31.0	78.0	26.2	100%	NA
EVAMS	12	1.4	2.5	9.9	12.5	32.0	10.0	100%	NA
MONM	12	1.8	5.2	7.9	18.0	56.0	12.8	100%	NA
MONMN	12	2.2	4.5	5.6	30.0	50.0	25.5	100%	NA
MONMS	12	1.4	2.9	3.7	7.9	17.0	5.1	100%	NA
TOSMO	12	6.7	20.0	25.0	61.5	110.0	41.5	100%	NA
TOSMI	12	9.8	14.0	19.5	31.5	55.0	17.5	100%	NA
COLM	12	0.6	1.2	1.6	2.8	63.0	1.7	100%	NA
SEIMN	12	4.3	6.5	10.5	29.0	100.0	22.6	100%	NA
SEIMS	12	2.8	5.9	7.0	29.5	52.0	23.7	100%	NA
COUMO	12	4.9	10.3	18.0	24.5	55.0	14.3	100%	NA
COUMI	12	15.0	19.0	34.5	57.5	160.0	38.5	100%	NA
TYLMO	12	3.9	5.0	8.5	19.5	34.0	14.6	100%	NA
TYLMI	12	3.6	5.2	8.6	11.8	40.0	6.6	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	71	78	87	95	100	17	100%	NA
EVAMS	4	76	84	93	103	110	19	100%	NA
MONM	4	76	85	95	108	120	24	100%	NA
MONMN	4	64	75	86	99	110	24	100%	NA
MONMS	4	110	120	135	170	200	50	100%	NA
TOSMO	4	100	105	115	130	140	25	100%	NA
TOSMI	4	67	89	115	130	140	42	100%	NA
COLM	4	7	11	21	94	160	82	100%	NA
SEIMN	4	19	24	29	41	51	17	100%	NA
SEIMS	4	35	42	50	56	60	14	100%	NA
COUMO	4	97	104	110	110	110	7	100%	NA
COUMI	4	12	61	130	165	180	104	100%	NA
TYLMO	4	72	82	91	96	100	14	100%	NA
TYLMI	4	80	89	104	115	120	27	100%	NA
Storm Event Samples									
EVALSS	12	42	69	76	84	90	16	100%	NA
EVAMS	12	43	71	79	89	95	19	100%	NA
MONM	12	35	54	61	77	98	23	100%	NA
MONMN	12	32	48	56	71	95	23	100%	NA
MONMS	12	42	73	79	99	140	26	100%	NA
TOSMO	12	37	46	49	69	93	23	100%	NA
TOSMI	12	23	32	41	49	67	17	100%	NA
COLM	12	6	10	13	14	29	4	100%	NA
SEIMN	12	17	22	27	37	66	15	100%	NA
SEIMS	12	21	37	42	45	52	8	100%	NA
COUMO	12	33	49	55	69	110	20	100%	NA
COUMI	12	47	69	88	94	110	25	100%	NA
TYLMO	12	26	28	36	44	49	16	100%	NA
TYLMI	12	29	42	50	58	94	16	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	2.2	2.7	3.3	3.9	4.3	1.2	100%	NA
EVAMS	4	2.6	3.0	3.6	4.3	4.8	1.4	100%	NA
MONM	4	2.9	3.2	3.7	4.3	4.5	1.1	100%	NA
MONMN	4	3.4	3.5	3.8	5.6	7.1	2.1	100%	NA
MONMS	4	3.9	4.2	5.1	5.9	6.2	1.7	100%	NA
TOSMO	4	2.0	2.3	2.9	3.2	3.2	0.9	100%	NA
TOSMI	4	2.3	2.6	2.9	3.2	3.4	0.6	100%	NA
COLM	4	9.4	10.7	13.5	16.5	18.0	5.8	100%	NA
SEIMN	4	1.7	4.0	6.9	7.7	7.8	3.7	100%	NA
SEIMS	4	2.8	3.2	3.9	4.7	5.3	1.5	100%	NA
COUMO	4	2.5	2.7	3.3	3.8	3.9	1.1	100%	NA
COUMI	4	2.8	3.0	3.3	3.6	3.8	0.6	100%	NA
TYLMO	4	3.3	3.6	4.0	4.3	4.5	0.7	100%	NA
TYLMI	4	2.7	3.6	4.5	4.8	5.0	1.2	100%	NA
Storm Event Samples									
EVALSS	12	3.7	4.9	6.9	9.2	13.0	4.4	100%	NA
EVAMS	12	4.4	5.8	7.6	10.3	14.0	4.6	100%	NA
MONM	12	4.8	5.1	5.6	7.1	8.8	2.0	100%	NA
MONMN	12	4.7	4.9	5.8	7.0	9.6	2.1	100%	NA
MONMS	12	5.1	6.1	7.5	8.3	8.7	2.3	100%	NA
TOSMO	12	4.0	5.7	6.9	7.3	13.0	1.6	100%	NA
TOSMI	12	3.7	5.2	5.6	9.4	12.0	4.2	100%	NA
COLM	12	10.0	11.0	13.0	15.0	17.0	4.0	100%	NA
SEIMN	12	3.7	6.9	9.7	10.0	17.0	3.2	100%	NA
SEIMS	12	6.0	7.7	8.9	10.7	17.0	3.1	100%	NA
COUMO	12	3.9	5.4	6.2	8.3	9.6	3.0	100%	NA
COUMI	12	4.6	6.2	8.2	9.8	11.0	3.6	100%	NA
TYLMO	12	3.8	4.8	5.8	6.5	8.6	1.8	100%	NA
TYLMI	12	5.0	5.6	7.3	9.1	12.0	3.5	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	2	21	66	151	210	130	100%	25%
EVAMS	4	1	20	41	147	250	128	75%	25%
MONM	4	2	71	185	240	250	169	100%	50%
MONMN	4	29	40	54	214	370	175	100%	25%
MONMS	4	1	8	17	28	35	20	75%	0%
TOSMO	4	8	54	120	1,170	2,200	1,116	100%	25%
TOSMI	4	8	22	128	240	260	218	100%	50%
COLM	4	2	3	15	32	38	29	100%	0%
SEIMN	4	1	2	6	30	49	28	75%	0%
SEIMS	4	1	5	35	181	300	176	75%	25%
COUMO	4	2	25	70	101	110	76	100%	0%
COUMI	4	2	11	60	330	560	319	100%	25%
TYLMO	4	4	10	163	555	800	546	100%	50%
TYLMI	4	4	7	155	310	320	303	100%	50%
Storm Event Samples									
EVALSS	12	82	130	210	660	5,000	530	100%	50%
EVAMS	12	31	49	125	900	3,200	851	100%	42%
MONM	12	86	125	220	695	2,100	570	100%	50%
MONMN	12	26	120	260	930	3,000	810	100%	58%
MONMS	12	9	67	200	625	1,900	558	100%	50%
TOSMO	12	74	225	1,100	1,650	4,000	1,425	100%	75%
TOSMI	12	36	175	900	1,650	6,200	1,475	100%	67%
COLM	12	4	15	17	113	2,700	98	100%	17%
SEIMN	12	4	11	57	245	1,000	235	100%	33%
SEIMS	12	7	23	155	710	2,500	687	100%	42%
COUMO	12	70	245	570	2,400	5,100	2,155	100%	75%
COUMI	12	58	180	400	1,850	6,500	1,670	100%	75%
TYLMO	12	210	320	530	1,100	1,600	780	100%	100%
TYLMI	12	12	76	160	660	2,000	584	100%	33%

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	0.014	0.021	0.032	0.036	0.036	0.015	100%	NA
EVAMS	4	0.021	0.022	0.029	0.036	0.036	0.015	100%	NA
MONM	4	0.020	0.029	0.039	0.043	0.046	0.014	100%	NA
MONMN	4	0.027	0.039	0.052	0.202	0.350	0.163	100%	NA
MONMS	4	0.024	0.025	0.029	0.046	0.060	0.022	100%	NA
TOSMO	4	0.052	0.059	0.068	0.074	0.076	0.015	100%	NA
TOSMI	4	0.050	0.059	0.079	0.101	0.110	0.042	100%	NA
COLM	4	0.005	0.009	0.025	0.061	0.084	0.052	75%	NA
SEIMN	4	0.022	0.024	0.032	0.041	0.043	0.017	100%	NA
SEIMS	4	0.022	0.026	0.039	0.050	0.051	0.025	100%	NA
COUMO	4	0.041	0.042	0.060	0.085	0.092	0.043	100%	NA
COUMI	4	0.056	0.078	0.115	0.135	0.140	0.057	100%	NA
TYLMO	4	0.025	0.027	0.043	0.084	0.110	0.058	100%	NA
TYLMI	4	0.018	0.025	0.039	0.068	0.090	0.043	100%	NA
Storm Event Samples									
EVALSS	12	0.030	0.045	0.088	0.130	0.250	0.085	100%	NA
EVAMS	12	0.017	0.026	0.061	0.071	0.120	0.046	100%	NA
MONM	12	0.035	0.050	0.065	0.130	0.270	0.080	100%	NA
MONMN	12	0.032	0.049	0.070	0.135	0.340	0.087	100%	NA
MONMS	12	0.034	0.045	0.062	0.073	0.340	0.028	100%	NA
TOSMO	12	0.062	0.100	0.120	0.265	0.360	0.166	100%	NA
TOSMI	12	0.057	0.115	0.130	0.160	0.230	0.045	100%	NA
COLM	12	0.005	0.018	0.026	0.034	0.230	0.016	92%	NA
SEIMN	12	0.036	0.058	0.070	0.145	0.310	0.088	100%	NA
SEIMS	12	0.037	0.054	0.075	0.140	0.210	0.087	100%	NA
COUMO	12	0.053	0.085	0.130	0.140	0.190	0.056	100%	NA
COUMI	12	0.092	0.140	0.185	0.290	0.400	0.150	100%	NA
TYLMO	12	0.046	0.049	0.060	0.105	0.130	0.056	100%	NA
TYLMI	12	0.040	0.057	0.071	0.102	0.210	0.045	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	1.61	1.71	1.91	2.06	2.11	0.35	100%	NA
EVAMS	4	2.23	2.31	2.41	2.60	2.75	0.29	100%	NA
MONM	4	0.64	0.65	0.72	0.79	0.81	0.14	100%	NA
MONMN	4	0.46	0.49	0.60	0.70	0.70	0.21	100%	NA
MONMS	4	0.66	0.67	0.71	0.85	0.95	0.18	100%	NA
TOSMO	4	0.86	0.91	1.09	1.25	1.28	0.34	100%	NA
TOSMI	4	0.75	0.91	1.13	1.45	1.70	0.54	100%	NA
COLM	4	0.52	0.67	0.88	1.12	1.30	0.45	100%	NA
SEIMN	4	0.50	0.53	0.62	0.68	0.68	0.15	100%	NA
SEIMS	4	0.53	0.58	0.72	0.80	0.80	0.22	100%	NA
COUMO	4	0.73	0.75	0.80	0.88	0.92	0.13	100%	NA
COUMI	4	0.50	0.55	0.66	0.76	0.79	0.21	100%	NA
TYLMO	4	0.63	0.84	1.10	1.62	2.08	0.78	100%	NA
TYLMI	4	1.11	1.18	1.34	1.47	1.51	0.29	100%	NA
Storm Event Samples									
EVALSS	12	1.40	1.76	2.01	2.40	3.71	0.65	100%	NA
EVAMS	12	1.72	2.04	2.33	2.64	4.91	0.60	100%	NA
MONM	12	0.51	0.66	0.93	1.13	1.53	0.47	100%	NA
MONMN	12	0.39	0.63	0.91	1.18	7.36	0.55	100%	NA
MONMS	12	0.58	0.72	0.84	0.98	1.12	0.26	100%	NA
TOSMO	12	0.63	1.01	1.22	1.35	1.95	0.34	100%	NA
TOSMI	12	0.62	0.99	1.16	1.31	1.74	0.32	100%	NA
COLM	12	0.05	0.66	0.81	0.91	1.10	0.26	92%	NA
SEIMN	12	0.41	0.70	0.82	1.25	1.88	0.55	100%	NA
SEIMS	12	0.54	0.72	1.08	1.42	2.29	0.70	100%	NA
COUMO	12	0.74	0.90	1.03	1.39	1.63	0.49	100%	NA
COUMI	12	0.84	1.02	1.10	1.36	1.88	0.34	100%	NA
TYLMO	12	0.54	0.75	0.96	1.13	1.36	0.38	100%	NA
TYLMI	12	0.74	1.00	1.15	1.32	1.73	0.32	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	1.20	1.25	1.35	1.55	1.70	0.30	100%	NA
EVAMS	4	1.70	1.80	1.95	2.05	2.10	0.25	100%	NA
MONM	4	0.20	0.20	0.20	0.30	0.40	0.10	100%	NA
MONMN	4	0.04	0.07	0.10	0.13	0.15	0.06	100%	NA
MONMS	4	0.05	0.08	0.12	0.33	0.53	0.24	100%	NA
TOSMO	4	0.53	0.54	0.57	0.72	0.85	0.19	100%	NA
TOSMI	4	0.44	0.57	0.71	0.75	0.76	0.18	100%	NA
COLM	4	0.03	0.04	0.05	0.09	0.12	0.06	100%	NA
SEIMN	4	0.13	0.13	0.14	0.21	0.27	0.08	100%	NA
SEIMS	4	0.19	0.21	0.24	0.28	0.30	0.08	100%	NA
COUMO	4	0.30	0.31	0.34	0.39	0.42	0.09	100%	NA
COUMI	4	0.17	0.21	0.26	0.28	0.28	0.08	100%	NA
TYLMO	4	0.29	0.30	0.44	0.68	0.78	0.38	100%	NA
TYLMI	4	0.64	0.71	0.78	0.86	0.94	0.16	100%	NA
Storm Event Samples									
EVALSS	12	0.70	0.99	1.05	1.20	1.60	0.22	100%	NA
EVAMS	12	0.85	1.10	1.30	1.65	2.00	0.55	100%	NA
MONM	12	0.09	0.15	0.23	0.29	0.35	0.14	100%	NA
MONMN	12	0.01	0.01	0.12	0.22	0.31	0.21	67%	NA
MONMS	12	0.03	0.11	0.18	0.30	0.44	0.19	100%	NA
TOSMO	12	0.24	0.27	0.31	0.37	0.50	0.10	100%	NA
TOSMI	12	0.17	0.26	0.31	0.36	0.45	0.10	100%	NA
COLM	12	0.01	0.04	0.06	0.09	0.18	0.06	92%	NA
SEIMN	12	0.08	0.11	0.13	0.17	0.50	0.07	100%	NA
SEIMS	12	0.12	0.17	0.22	0.27	0.55	0.11	100%	NA
COUMO	12	0.21	0.27	0.34	0.40	0.46	0.13	100%	NA
COUMI	12	0.10	0.26	0.37	0.41	0.52	0.15	100%	NA
TYLMO	12	0.07	0.18	0.23	0.27	0.36	0.09	100%	NA
TYLMI	12	0.20	0.28	0.29	0.39	0.86	0.11	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	0.31	0.36	0.46	0.61	0.71	0.25	100%	NA
EVAMS	4	0.44	0.46	0.50	0.59	0.65	0.13	100%	NA
MONM	4	0.41	0.43	0.45	0.52	0.57	0.09	100%	NA
MONMN	4	0.40	0.41	0.48	0.57	0.59	0.17	100%	NA
MONMS	4	0.42	0.48	0.58	0.63	0.64	0.15	100%	NA
TOSMO	4	0.33	0.35	0.40	0.56	0.69	0.21	100%	NA
TOSMI	4	0.31	0.35	0.42	0.70	0.94	0.36	100%	NA
COLM	4	0.48	0.63	0.83	1.02	1.18	0.39	100%	NA
SEIMN	4	0.37	0.39	0.42	0.48	0.53	0.09	100%	NA
SEIMS	4	0.31	0.38	0.47	0.52	0.54	0.14	100%	NA
COUMO	4	0.31	0.39	0.47	0.55	0.62	0.16	100%	NA
COUMI	4	0.31	0.32	0.40	0.49	0.51	0.17	100%	NA
TYLMO	4	0.34	0.36	0.43	1.12	1.77	0.77	100%	NA
TYLMI	4	0.47	0.47	0.53	0.61	0.65	0.14	100%	NA
Storm Event Samples									
EVALSS	12	0.47	0.55	0.81	1.42	2.61	0.86	100%	NA
EVAMS	12	0.47	0.61	0.81	1.23	3.61	0.62	100%	NA
MONM	12	0.22	0.51	0.71	0.96	1.25	0.45	100%	NA
MONMN	12	0.39	0.47	0.71	1.06	7.36	0.59	100%	NA
MONMS	12	0.44	0.57	0.65	0.70	0.91	0.13	100%	NA
TOSMO	12	0.36	0.68	0.85	1.03	1.67	0.35	100%	NA
TOSMI	12	0.37	0.69	0.82	0.99	1.48	0.30	100%	NA
COLM	12	0.10	0.61	0.72	0.79	1.06	0.18	92%	NA
SEIMN	12	0.30	0.56	0.68	1.00	1.67	0.45	100%	NA
SEIMS	12	0.42	0.57	0.84	1.20	1.91	0.62	100%	NA
COUMO	12	0.41	0.58	0.78	0.98	1.23	0.40	100%	NA
COUMI	12	0.48	0.71	0.81	1.08	1.44	0.38	100%	NA
TYLMO	12	0.39	0.55	0.70	0.88	1.14	0.33	100%	NA
TYLMI	12	0.45	0.57	0.74	0.93	1.45	0.35	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	0.5	0.5	0.0	0%	0%
MONMN	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
MONMS	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
TOSMO	4	0.5	0.5	0.5	0.8	1.1	0.3	25%	0%
TOSMI	4	0.5	0.5	0.5	0.9	1.3	0.4	25%	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	0.5	0.5	0.75	1	0.3	25%	0%
TYLMI	4	0.5	0.75	1.2	1.5	1.7	0.8	75%	0%
Storm Event Samples									
EVALSS	12	0.5	0.5	0.5	1.1	1.4	0.6	42%	0%
EVAMS	12	0.5	0.5	0.5	0.5	2.0	0.0	17%	0%
MONM	12	0.5	0.5	1.2	1.5	2.3	1.0	67%	0%
MONMN	12	0.5	0.5	1.2	1.3	1.5	0.8	58%	0%
MONMS	12	0.5	1.1	1.5	1.7	5.7	0.7	83%	8%
TOSMO	12	1.7	2.2	2.6	3.1	8.9	0.9	100%	0%
TOSMI	12	1.8	2.5	3.7	5.3	7.7	2.9	100%	0%
COLM	12	0.5	0.5	0.5	0.5	0.5	0.0	0%	0%
SEIMN	12	0.5	0.5	0.5	0.5	1.0	0.0	17%	0%
SEIMS	12	0.5	0.5	0.5	0.5	2.9	0.0	8%	8%
COUMO	12	1.4	2.0	2.1	2.5	6.0	0.5	100%	0%
COUMI	12	1.3	1.8	2.1	2.5	4.8	0.7	100%	0%
TYLMO	12	2.0	2.6	3.4	4.2	14.0	1.6	100%	0%
TYLMI	12	1.5	2.5	2.8	4.2	28.0	1.7	100%	8%

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	0.8	1.0	0.3	25%	NA
MONMN	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	NA
MONMS	4	0.5	0.5	0.5	0.9	1.3	0.4	25%	NA
TOSMO	4	0.5	0.5	0.5	1.2	1.8	0.7	25%	NA
TOSMI	4	0.5	1.2	2.2	2.9	3.3	1.7	75%	NA
COLM	4	0.5	0.5	0.5	1.0	1.4	0.5	25%	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	0.5	0.5	0.0	0%	NA
COUMI	4	0.5	0.5	0.5	0.5	0.5	0.0	0%	NA
TYLMO	4	0.5	0.5	0.5	0.8	1.0	0.3	25%	NA
TYLMI	4	1.7	1.8	2.4	5.0	7.0	3.3	100%	NA
Storm Event Samples									
EVALSS	12	0.5	0.5	2.0	3.1	4.9	2.6	67%	NA
EVAMS	12	0.5	0.5	1.3	1.8	2.0	1.3	58%	NA
MONM	12	1.0	1.3	1.7	3.2	4.2	1.9	100%	NA
MONMN	12	0.5	1.3	1.8	3.1	4.8	1.9	83%	NA
MONMS	12	0.5	1.4	2.0	2.3	7.8	1.0	92%	NA
TOSMO	12	2.9	4.8	5.4	10.9	16.0	6.1	100%	NA
TOSMI	12	2.9	5.7	6.6	10.7	14.0	5.0	100%	NA
COLM	12	0.5	0.5	0.5	0.5	3.6	0.0	17%	NA
SEIMN	12	0.5	1.1	1.5	2.4	6.9	1.4	83%	NA
SEIMS	12	0.5	0.5	0.8	1.8	3.1	1.3	50%	NA
COUMO	12	2.4	3.1	4.4	5.3	8.8	2.2	100%	NA
COUMI	12	2.7	3.5	5.2	9.0	11.0	5.6	100%	NA
TYLMO	12	3.1	3.7	5.1	7.0	20.0	3.4	100%	NA
TYLMI	12	2.7	3.2	5.4	8.2	38.0	5.0	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	5.5	6.8	8.0	2.9	75%	0%
MONMN	4	2.5	2.5	2.5	12.8	23.0	10.3	25%	0%
MONMS	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
TOSMO	4	2.5	5.0	9.8	14.5	17.0	9.5	75%	0%
TOSMI	4	7.2	7.4	11.8	18.5	21.0	11.2	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	5.0	6.2	7.5	8.7	9.7	2.6	100%	0%
COUMI	4	2.5	2.5	5.4	11.6	15.0	9.1	50%	0%
TYLMO	4	2.5	2.5	2.5	4.1	5.7	1.6	25%	0%
TYLMI	4	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
Storm Event Samples									
EVALSS	12	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
EVAMS	12	2.5	2.5	2.5	2.5	6.2	0.0	17%	0%
MONM	12	2.5	5.7	8.3	16.0	24.0	10.4	83%	8%
MONMN	12	2.5	2.5	2.5	4.2	9.6	1.7	25%	0%
MONMS	12	2.5	2.5	2.5	2.5	5.2	0.0	8%	0%
TOSMO	12	9.5	13.5	19.0	33.5	470.0	20.0	100%	17%
TOSMI	12	18.0	31.0	35.0	48.5	1200.0	17.5	100%	17%
COLM	12	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
SEIMN	12	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
SEIMS	12	2.5	2.5	2.5	2.5	2.5	0.0	0%	0%
COUMO	12	12.0	19.0	22.0	68.0	470.0	49.0	100%	25%
COUMI	12	5.2	8.4	13.0	27.0	170.0	18.7	100%	8%
TYLMO	12	5.7	7.6	10.0	13.5	26.0	5.9	100%	0%
TYLMI	12	2.5	2.5	4.1	10.0	11.0	7.5	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	6.1	6.4	7.2	8.4	9.1	2.0	100%	NA
MONMN	4	2.5	2.5	2.5	4.4	6.3	1.9	25%	NA
MONMS	4	2.5	2.5	2.5	4.2	5.8	1.7	25%	NA
TOSMO	4	2.5	6.3	12.0	24.0	34.0	17.8	75%	NA
TOSMI	4	12.0	24.5	42.5	57.5	67.0	33.0	100%	NA
COLM	4	2.5	2.5	2.5	4.2	5.9	1.7	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	10.0	11.0	13.0	15.0	16.0	4.0	100%	NA
COUMI	4	5.4	5.5	11.3	28.0	39.0	22.6	100%	NA
TYLMO	4	6.1	6.2	6.7	7.6	8.0	1.5	100%	NA
TYLMI	4	2.5	5.0	11.7	54.0	92.0	49.1	75%	NA
Storm Event Samples									
EVALSS	12	2.5	2.5	2.5	10.0	14.0	7.5	42%	NA
EVAMS	12	2.5	2.5	5.4	7.2	10.0	4.7	58%	NA
MONM	12	7.8	11.5	22.0	37.5	42.0	26.0	100%	NA
MONMN	12	2.5	5.3	7.6	18.0	47.0	12.7	83%	NA
MONMS	12	2.5	2.5	2.5	6.2	7.8	3.7	42%	NA
TOSMO	12	18.0	40.5	44.5	135.0	600.0	94.5	100%	NA
TOSMI	12	46.0	55.5	69.5	160.0	1700.0	104.5	100%	NA
COLM	12	2.5	2.5	2.5	2.5	6.4	0.0	17%	NA
SEIMN	12	2.5	2.5	2.5	2.5	15.0	0.0	17%	NA
SEIMS	12	2.5	2.5	2.5	5.8	9.8	3.3	42%	NA
COUMO	12	26.0	33.0	47.5	116.0	470.0	83.0	100%	NA
COUMI	12	23.0	27.5	50.0	85.5	280.0	58.0	100%	NA
TYLMO	12	12.0	17.0	20.0	24.5	53.0	7.5	100%	NA
TYLMI	12	2.5	12.0	14.0	20.5	44.0	8.5	92%	NA

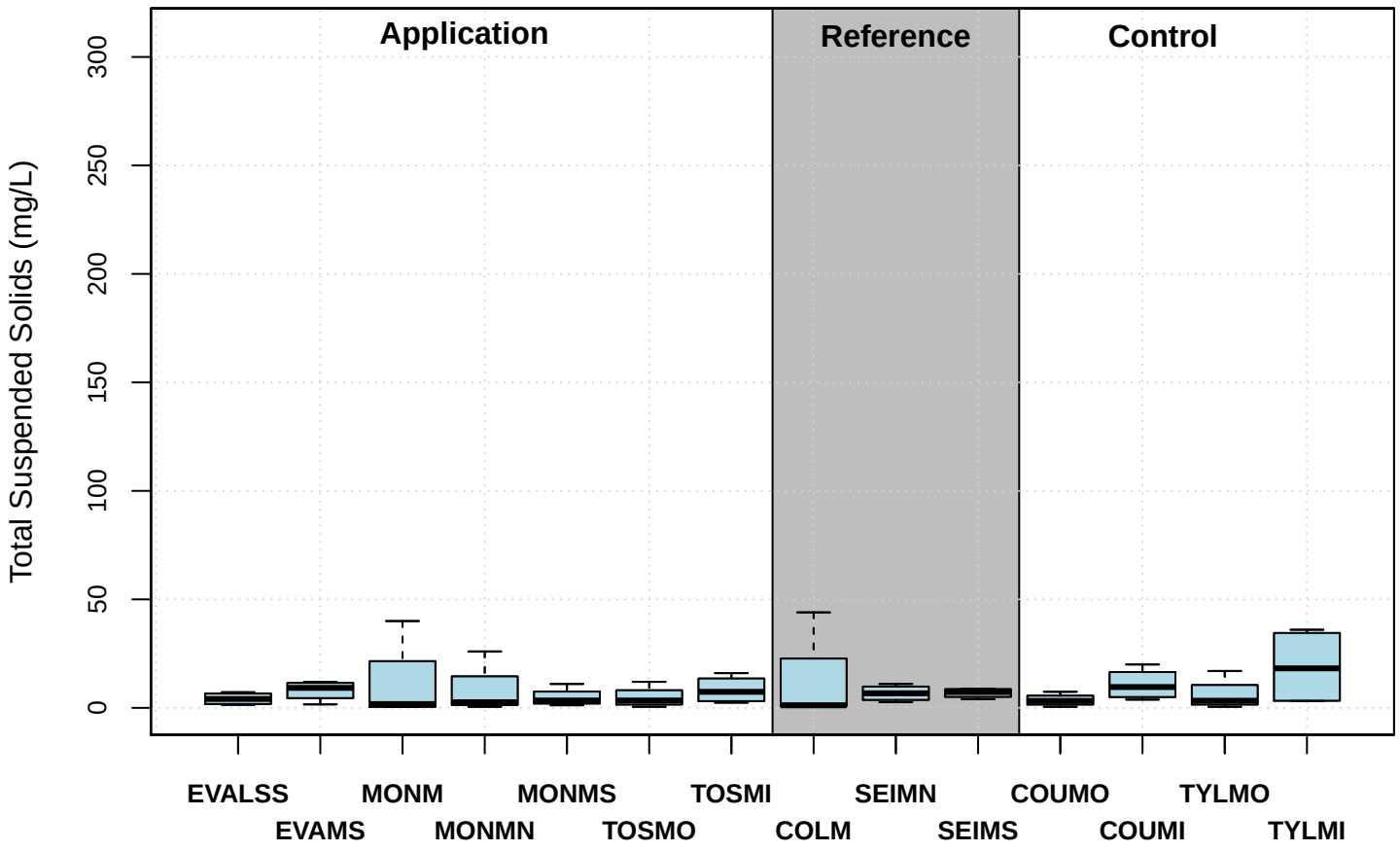
µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

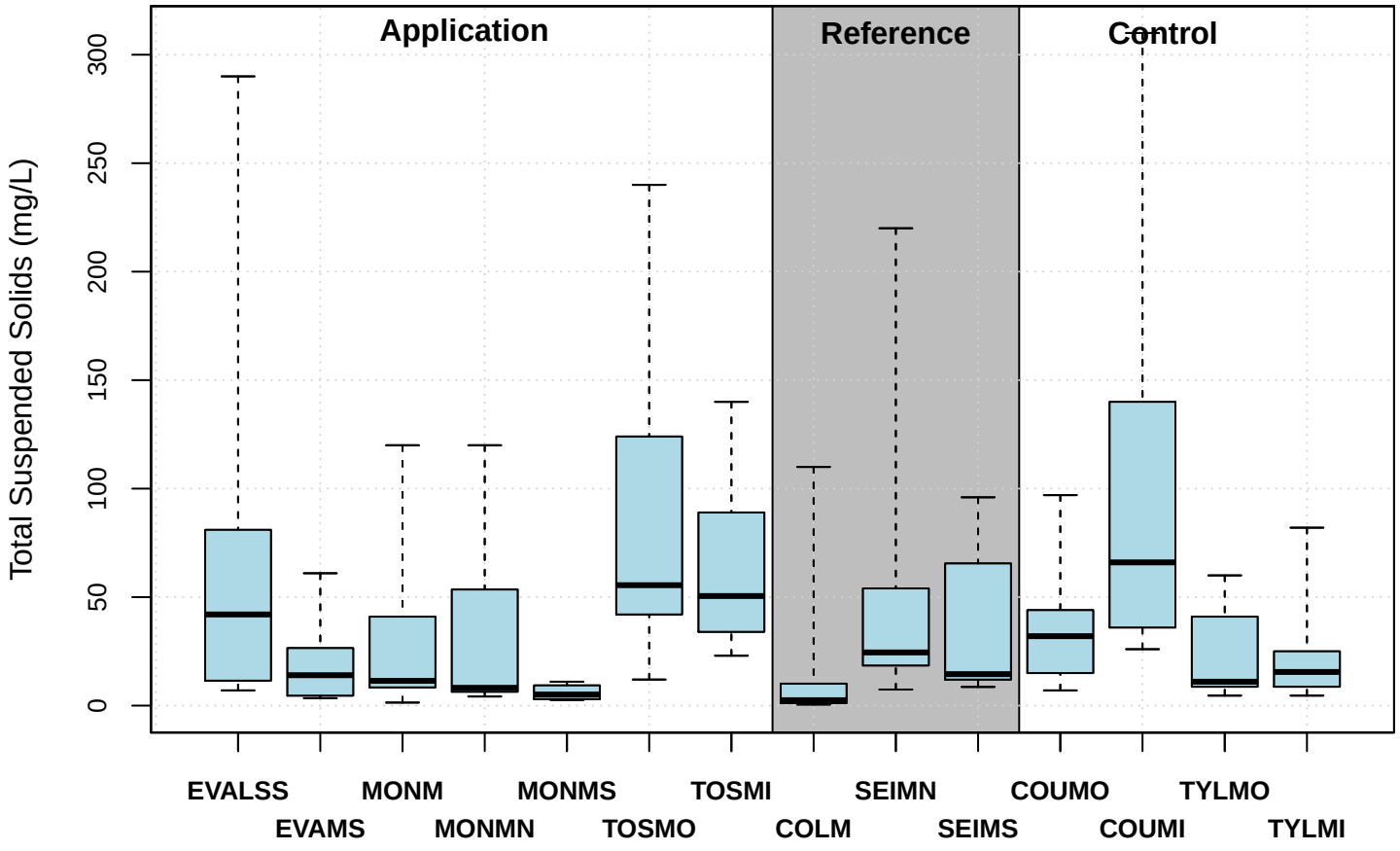
APPENDIX I

Box and Whisker Plots Showing Pollutant Concentrations Measured in Storm Event and Base Flow Samples

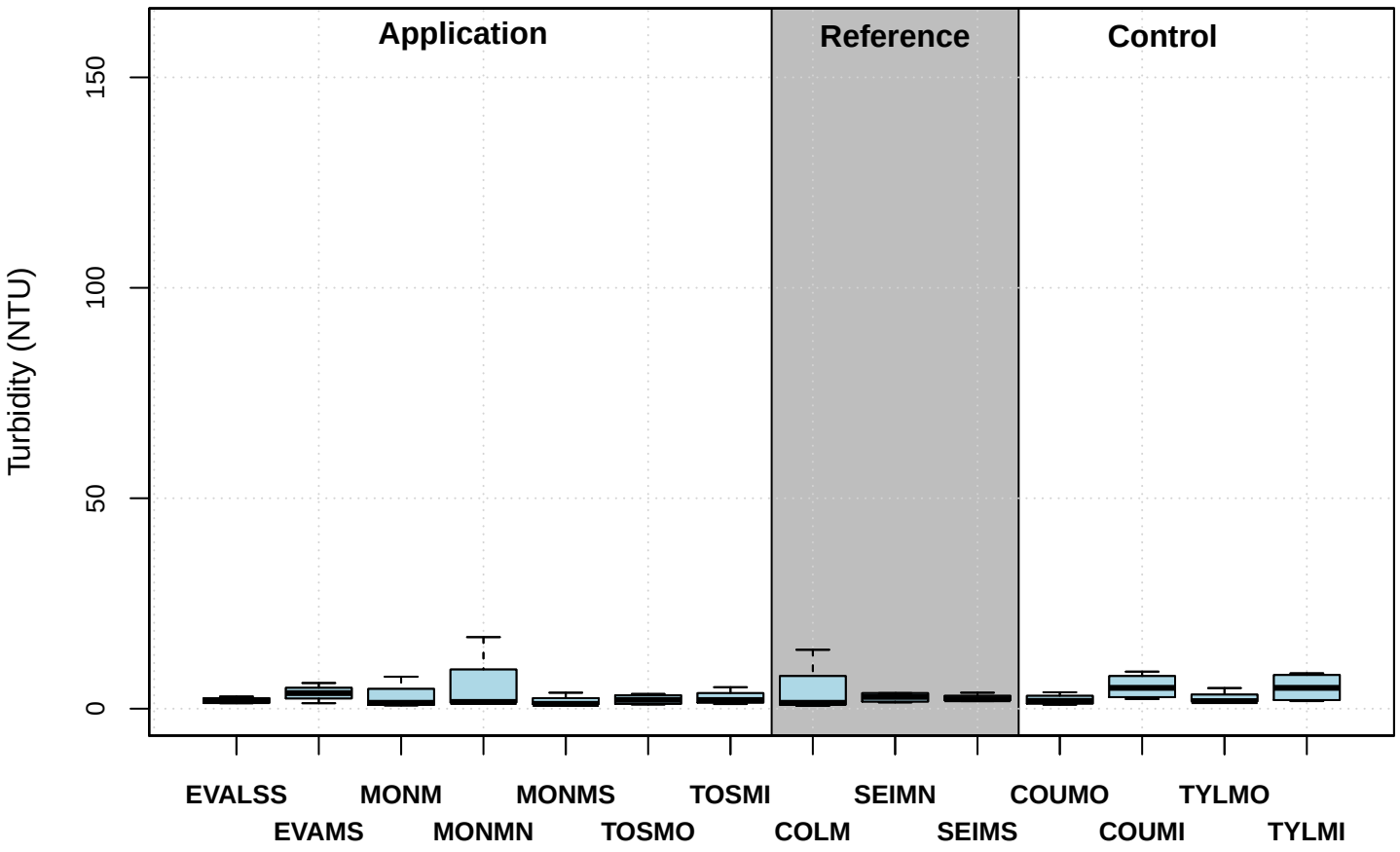
Base Flow



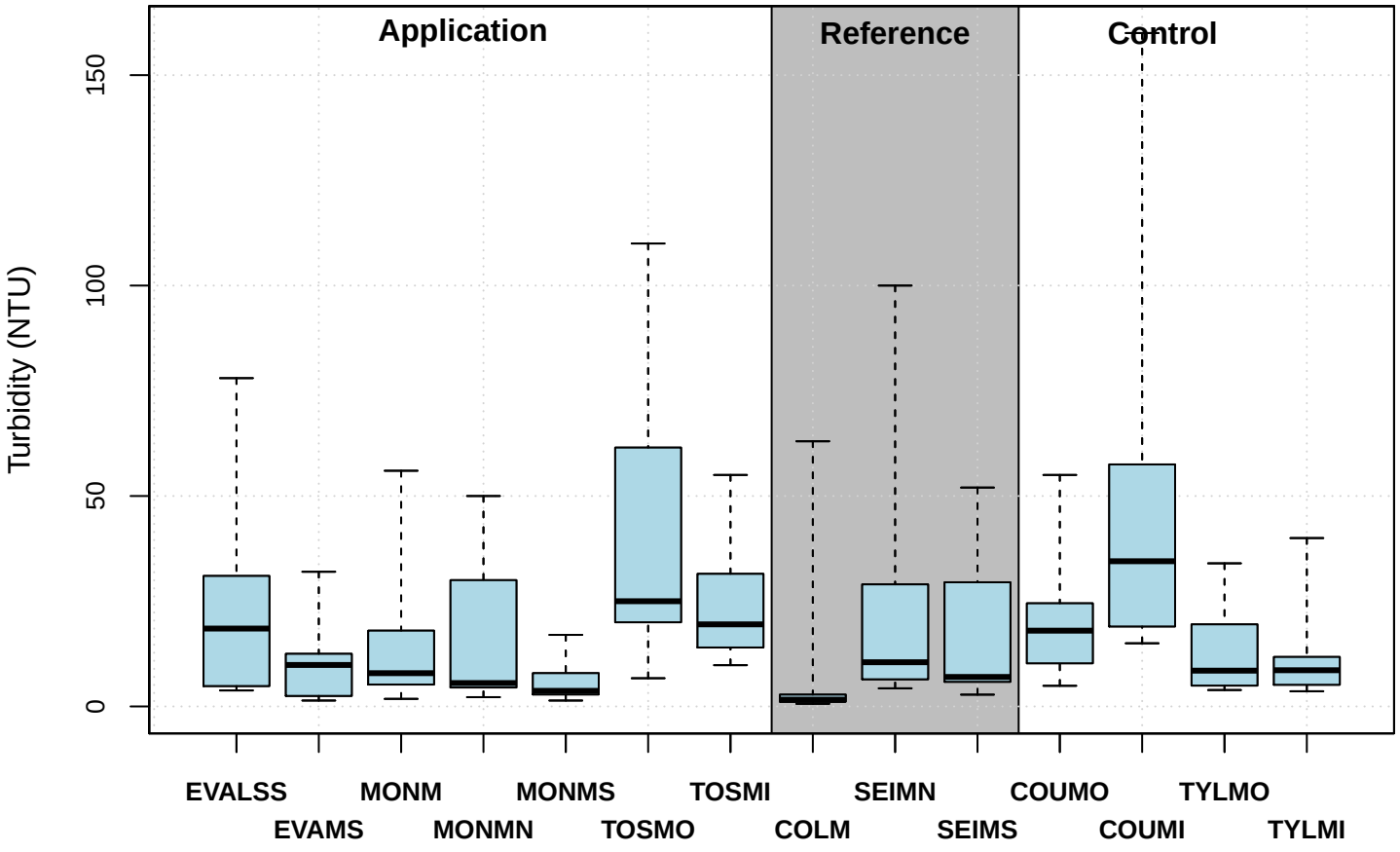
Storm Events

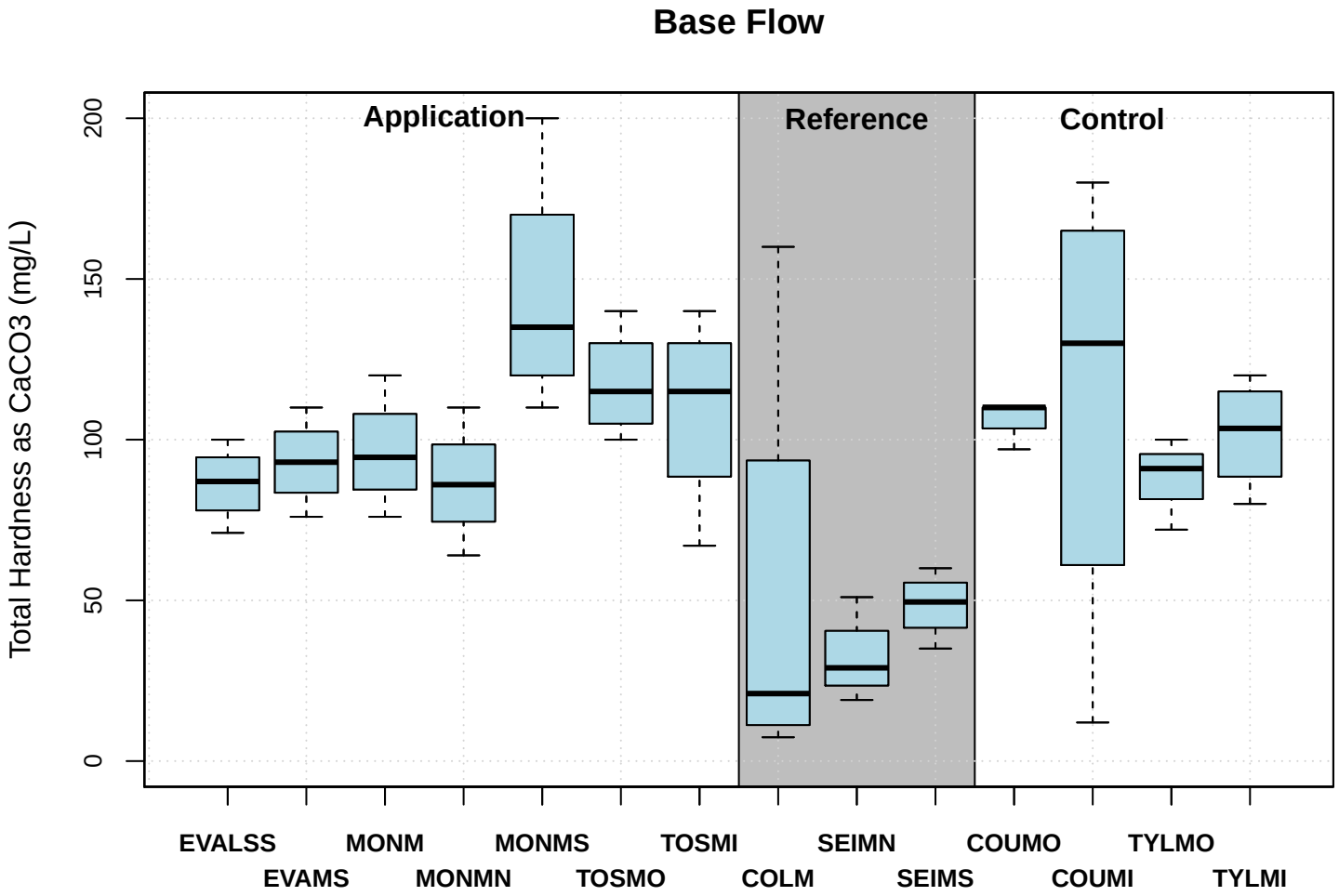


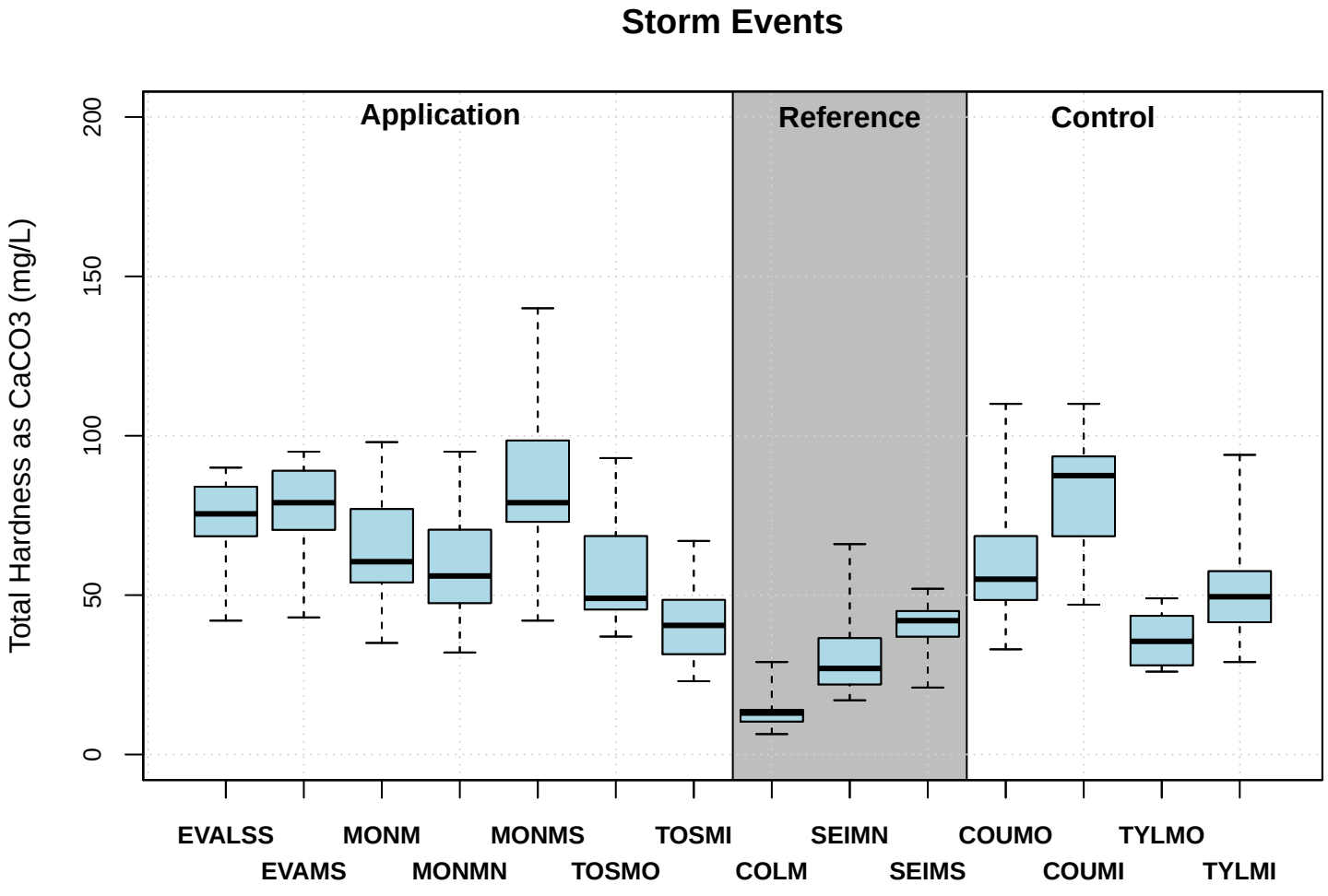
Base Flow



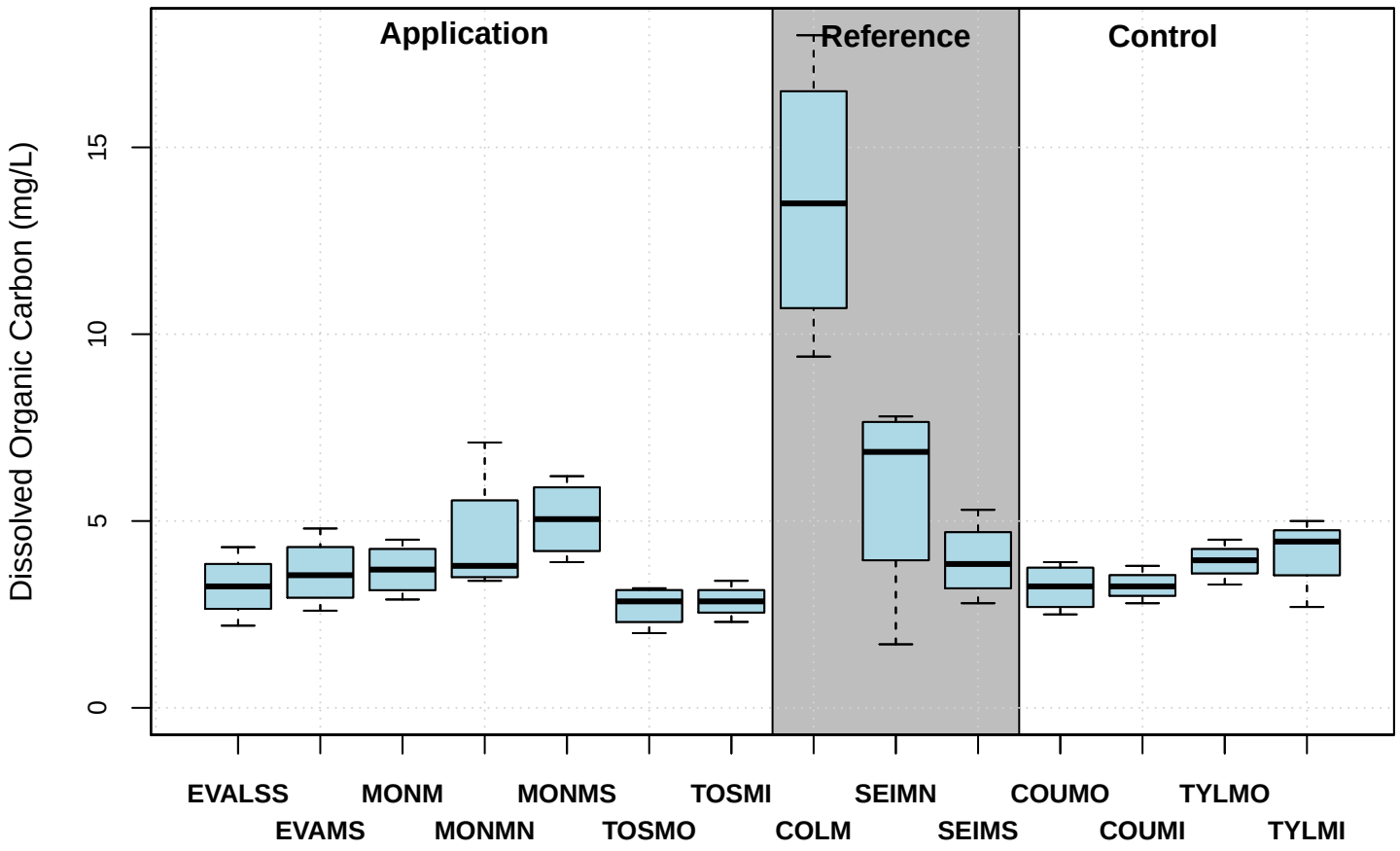
Storm Events



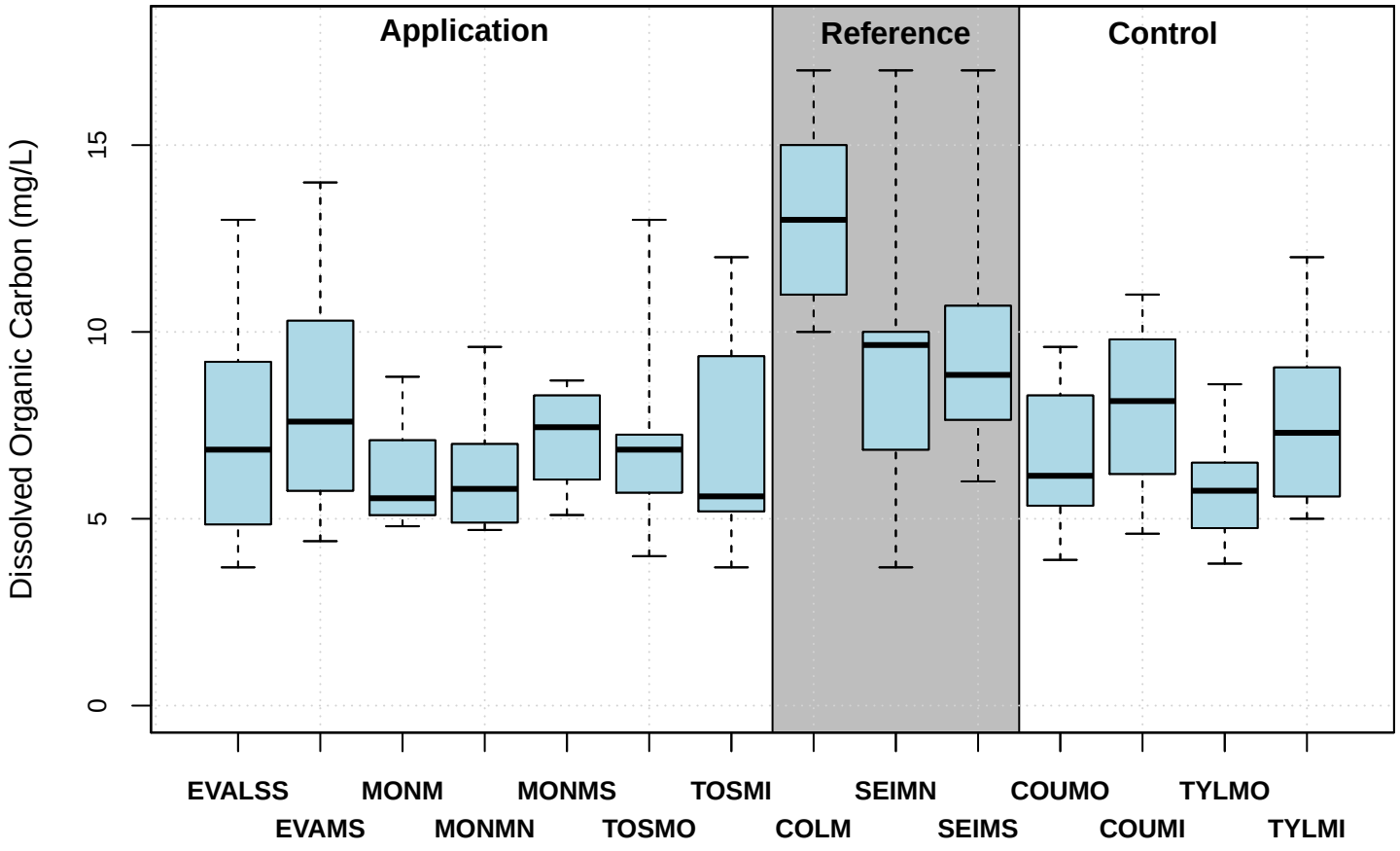

Base Flow
Application
Reference
Control
Total Hardness as CaCO3 (mg/L)
0
50
100
150
200
EVALSS
EVAMS
MONM
MONMN
MONMS
TOSMO
TOSMI
COLM
SEIMN
SEIMS
COUMO
COUMI
TYLMO
TYLMI


Storm Events
Application
Reference
Control
Total Hardness as CaCO3 (mg/L)
0
50
100
150
200
EVALSS
EVAMS
MONM
MONMN
MONMS
TOSMO
TOSMI
COLM
SEIMN
SEIMS
COUMO
COUMI
TYLMO
TYLMI

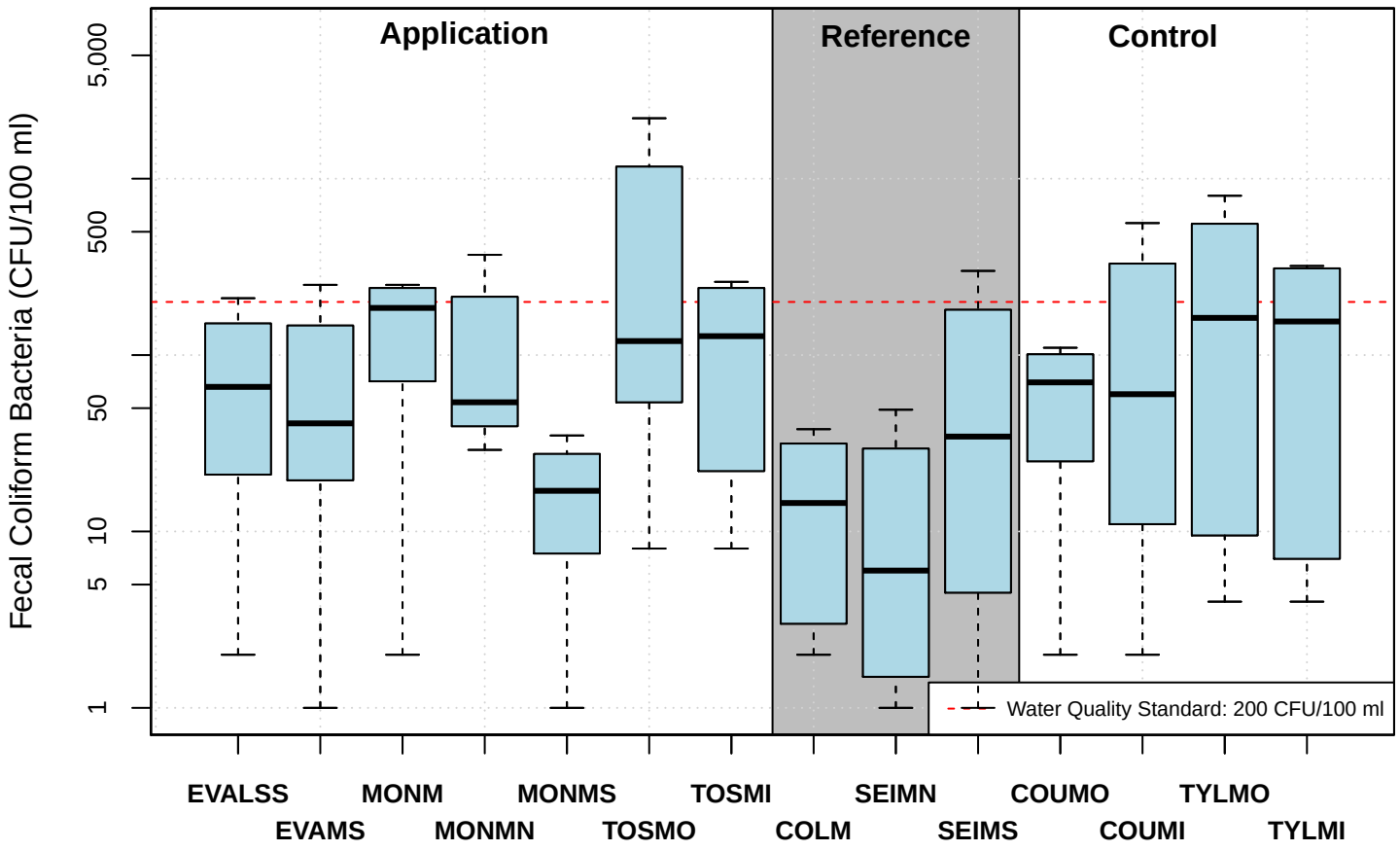
Base Flow



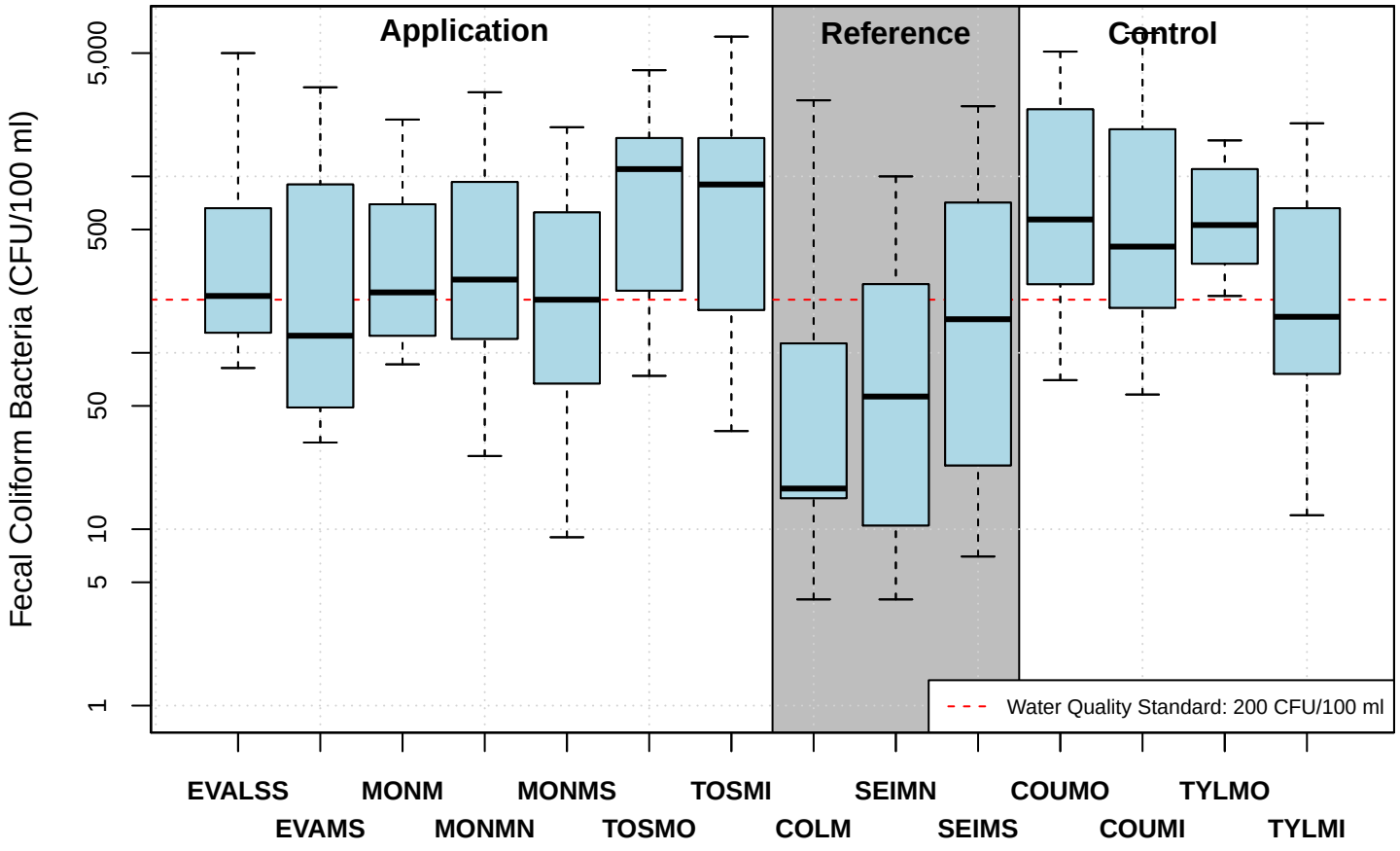
Storm Events



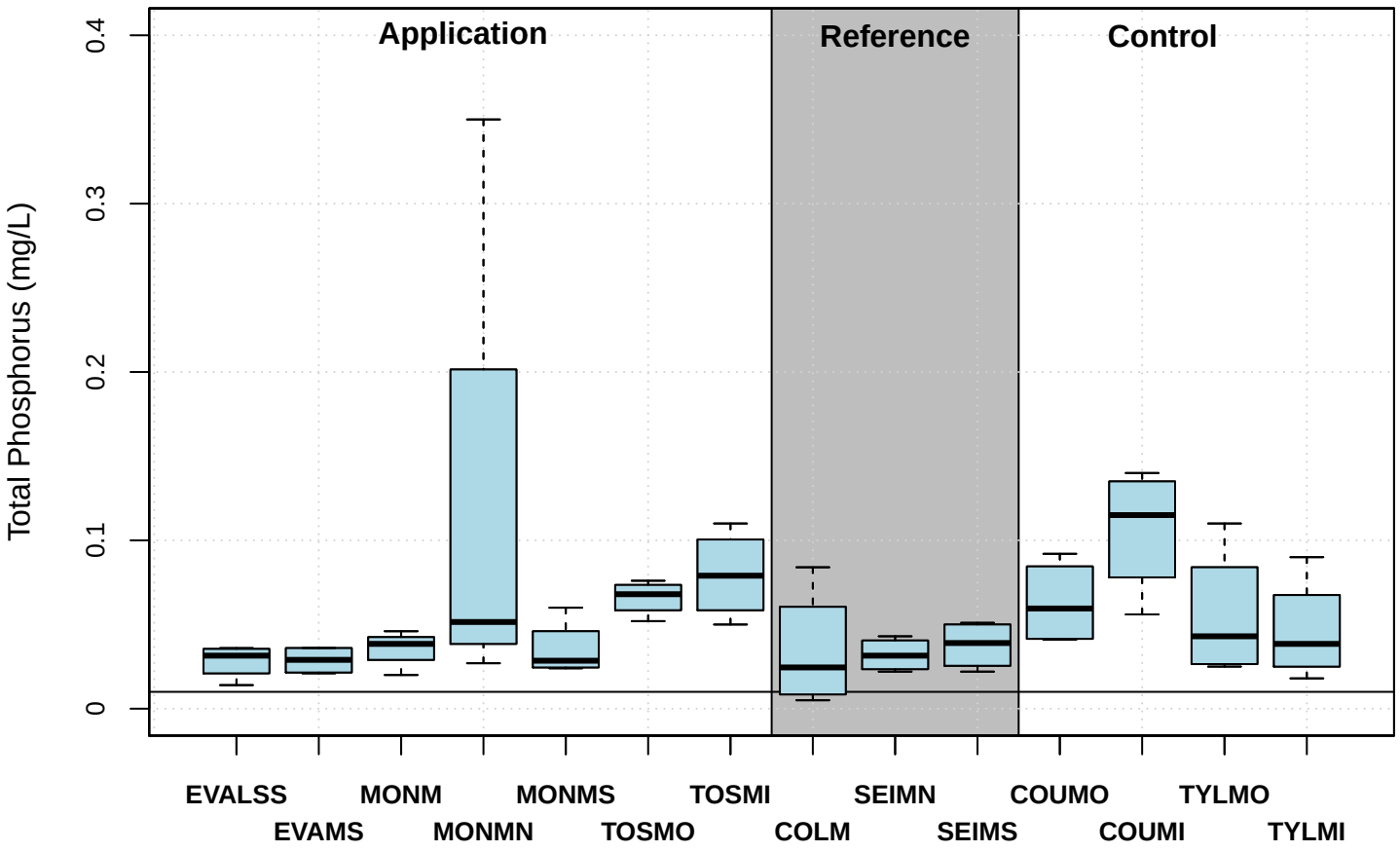
Base Flow



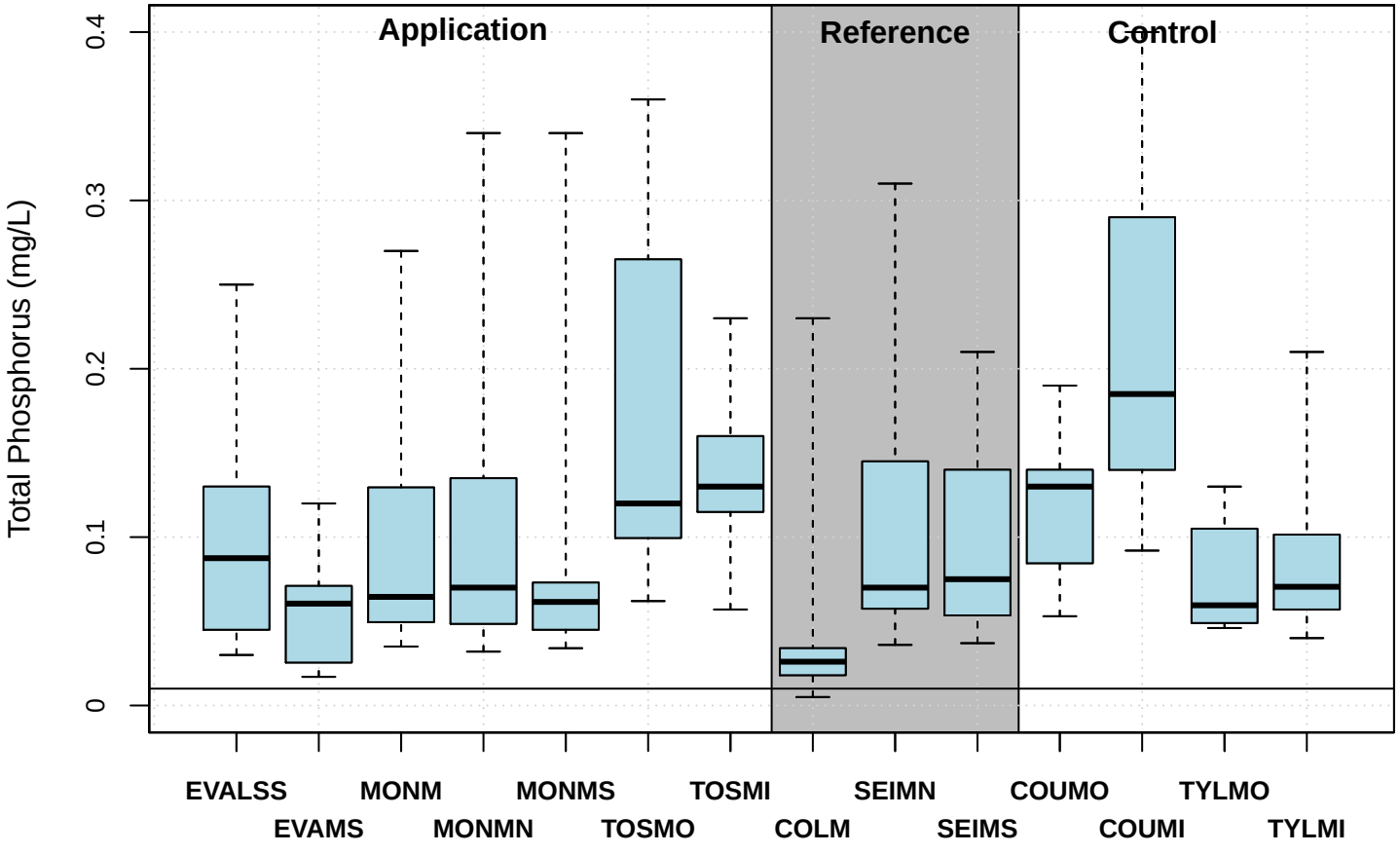
Storm Events

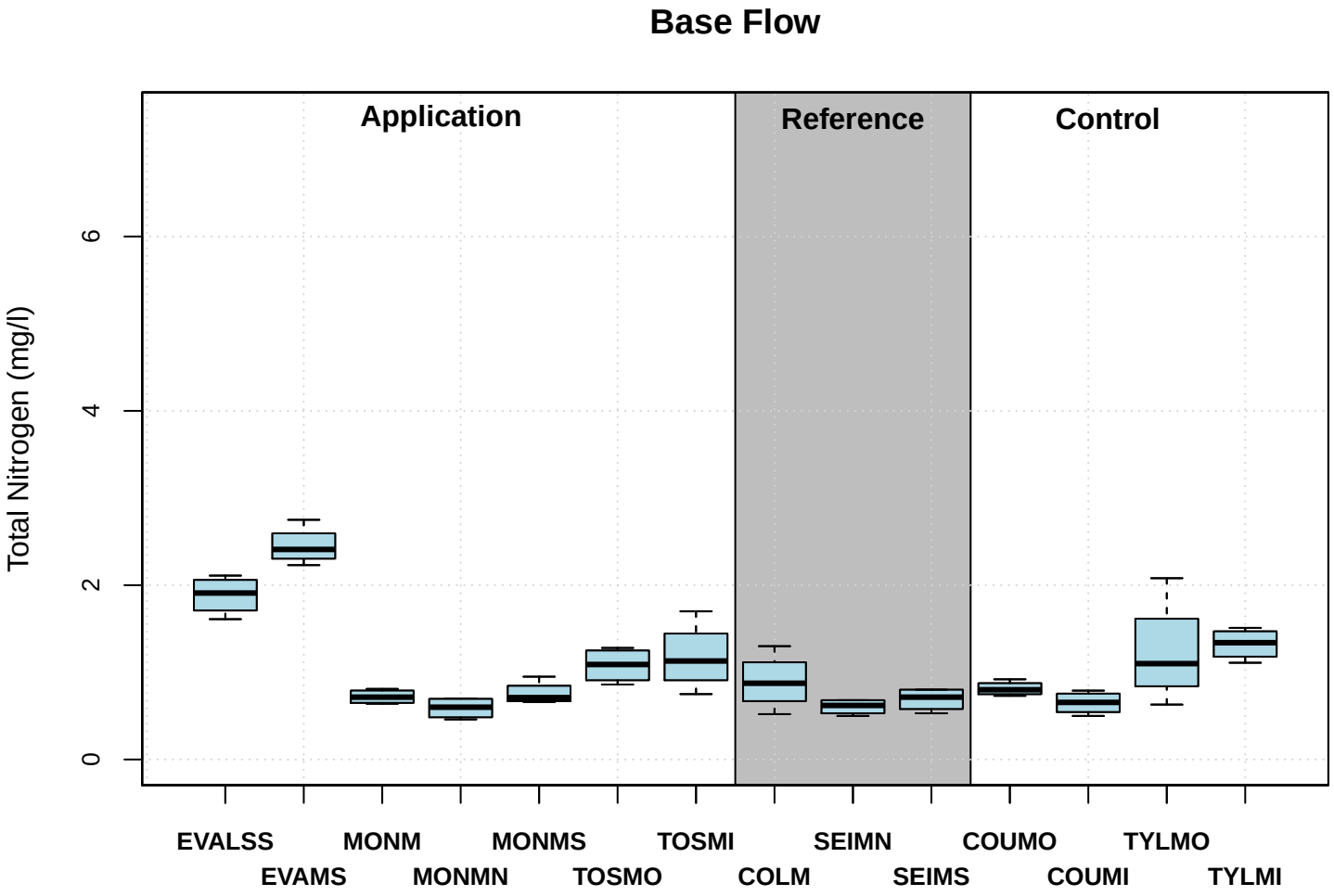


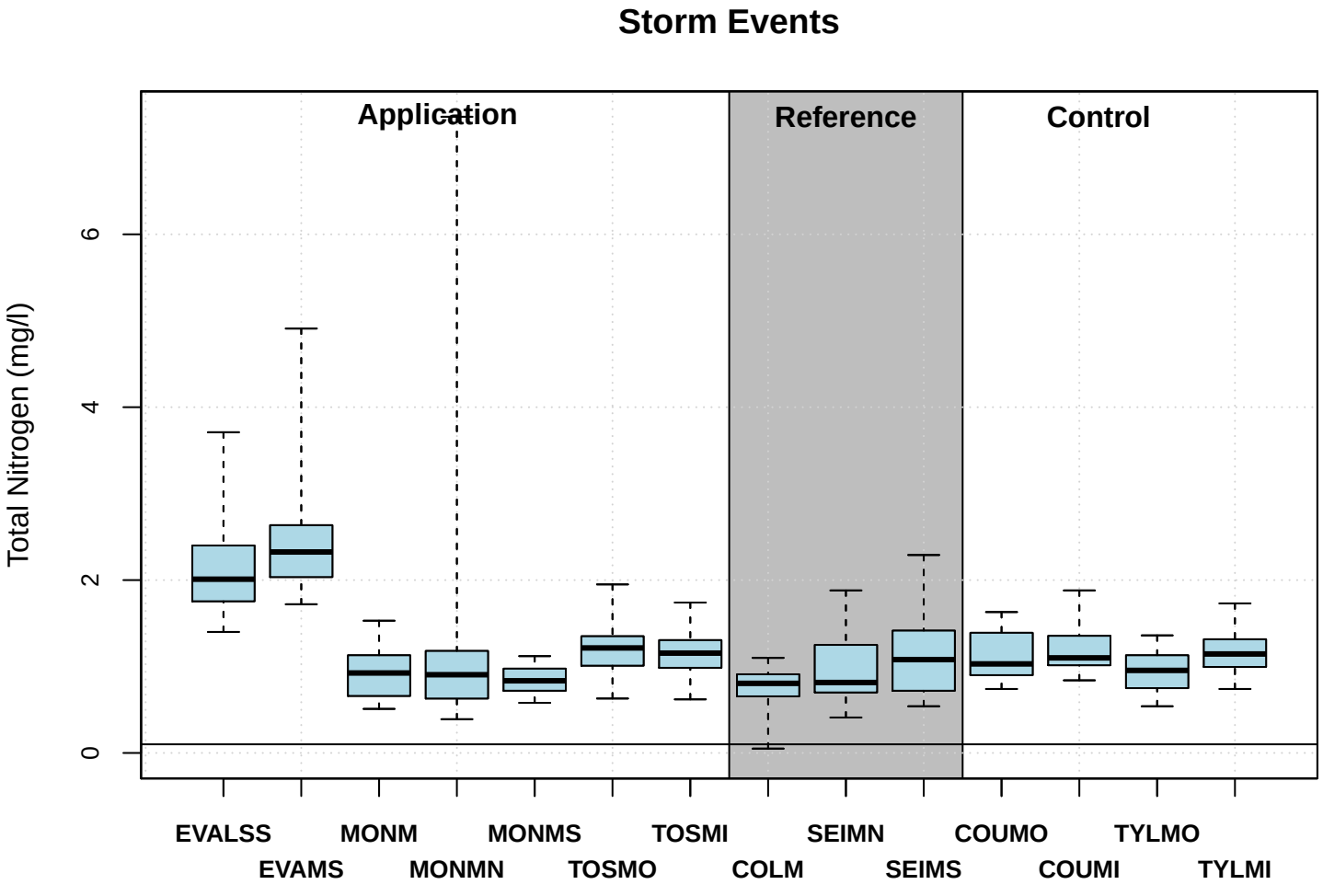
Base Flow



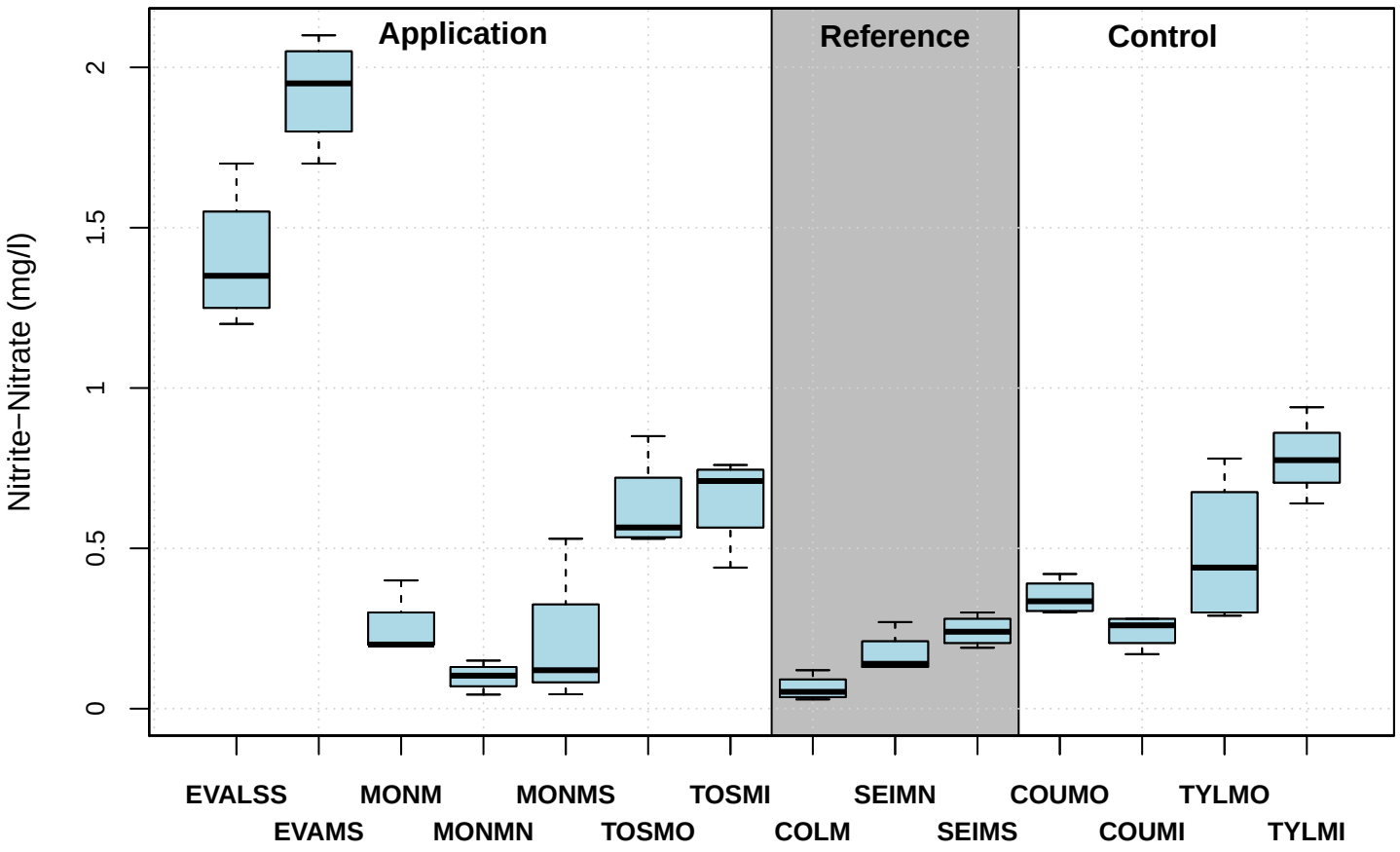
Storm Events



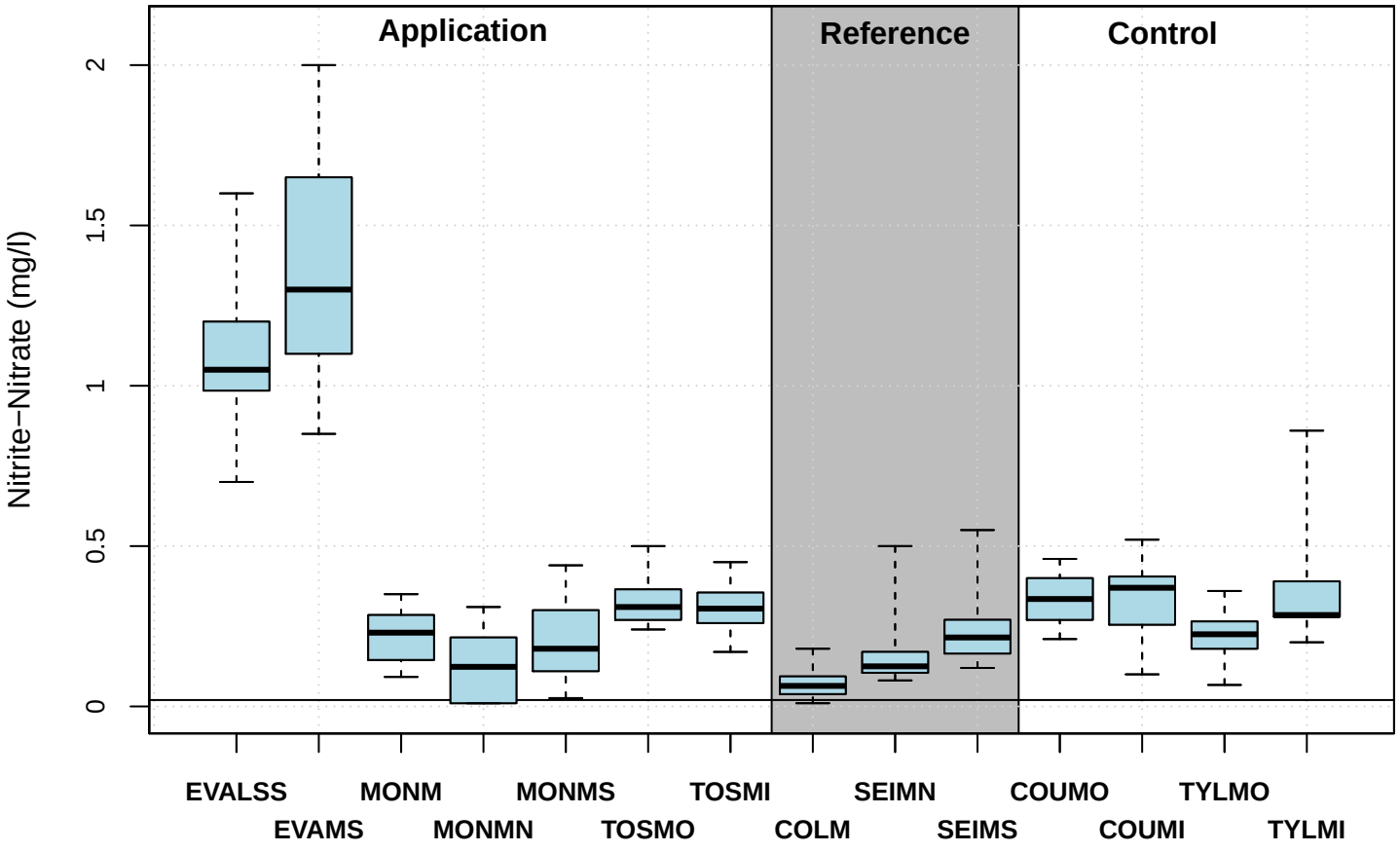

Base Flow
Application
Reference
Control
Total Nitrogen (mg/l)
0
2
4
6
EVALSS
EVAMS
MONM
MONMN
MONMS
TOSMO
TOSMI
COLM
SEIMN
SEIMS
COUMO
COUMI
TYLMO
TYLMI


Storm Events
Application
Reference
Control
Total Nitrogen (mg/l)
0
2
4
6
EVALSS
EVAMS
MONM
MONMN
MONMS
TOSMO
TOSMI
COLM
SEIMN
SEIMS
COUMO
COUMI
TYLMO
TYLMI

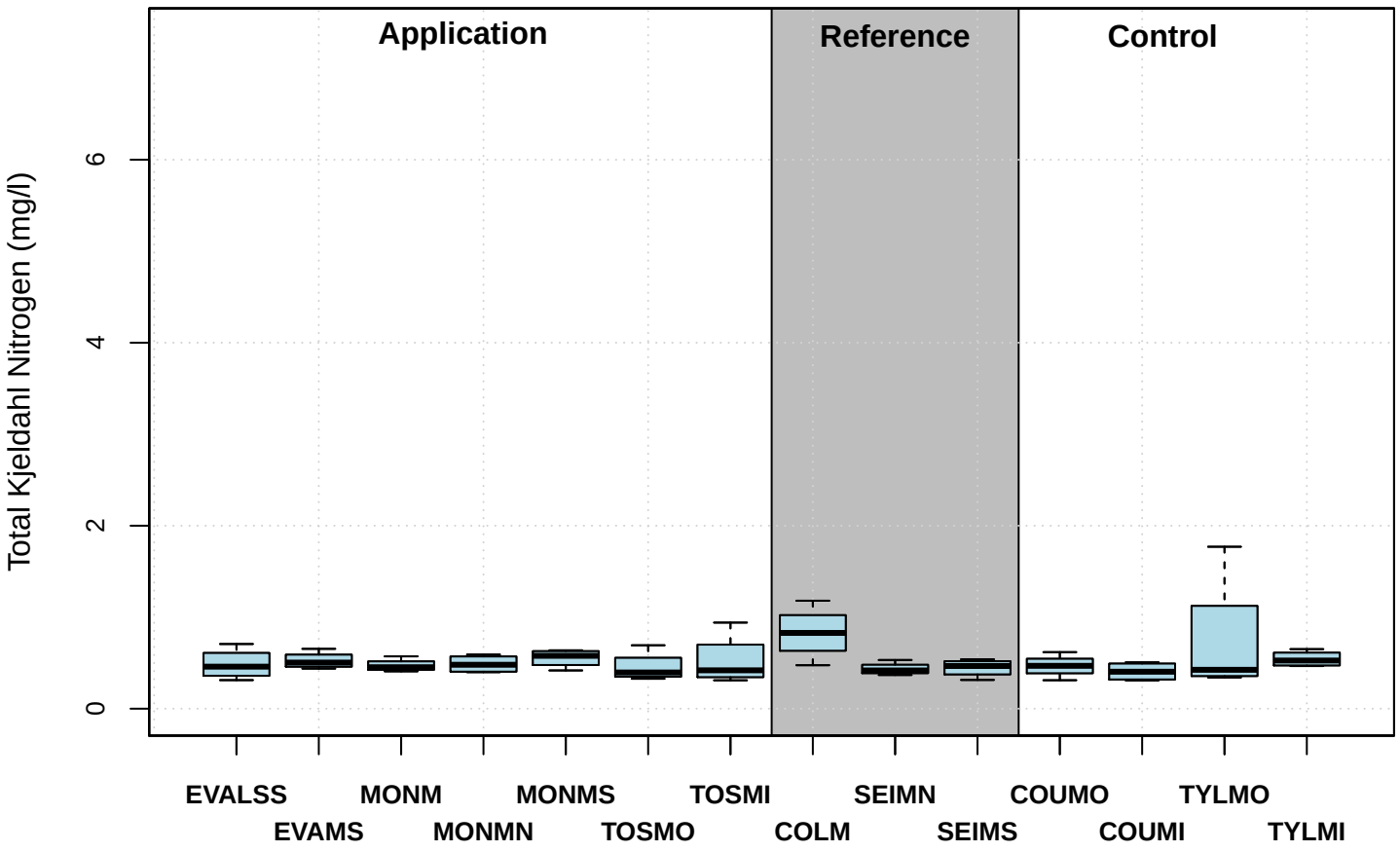
Base Flow



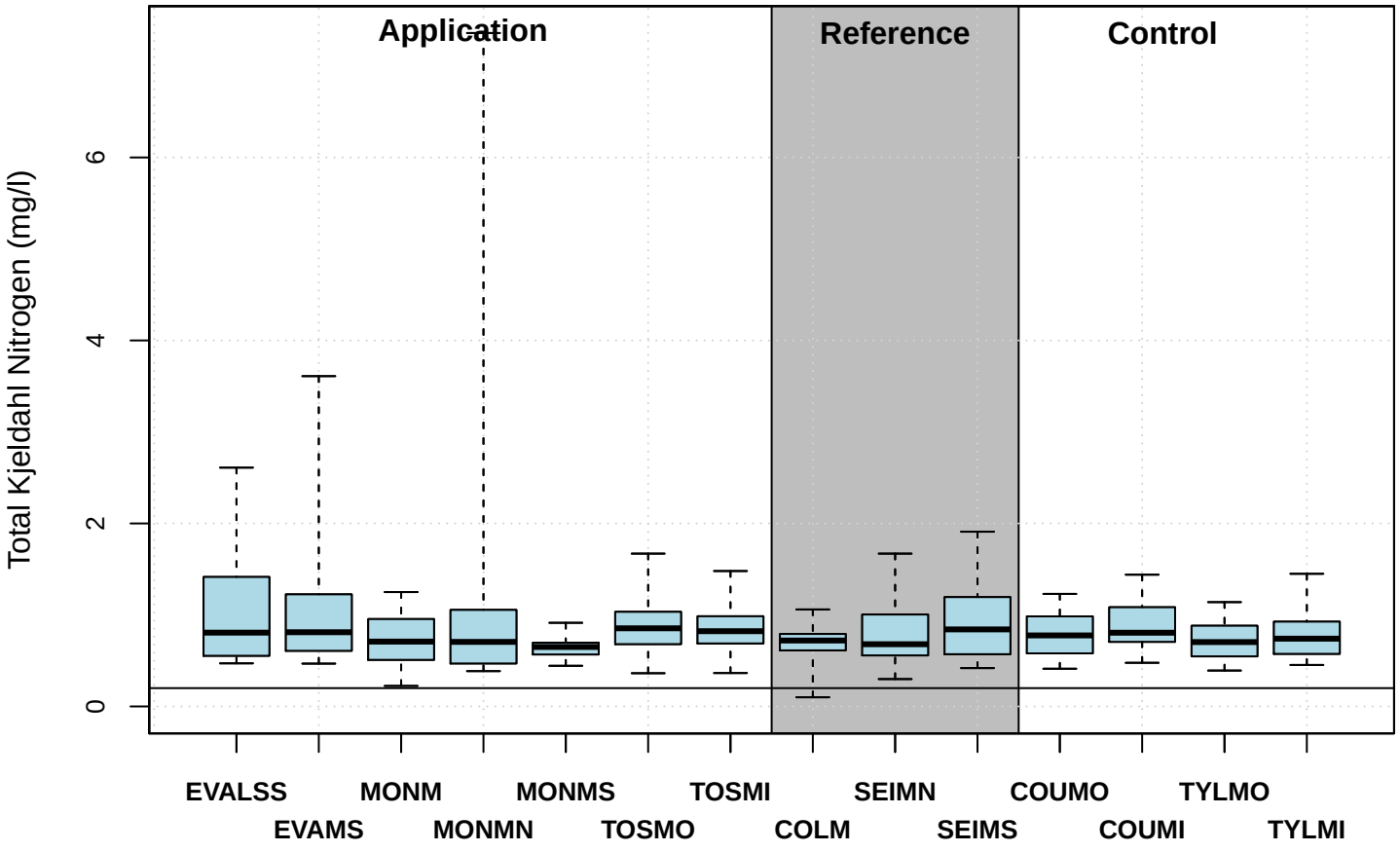
Storm Events



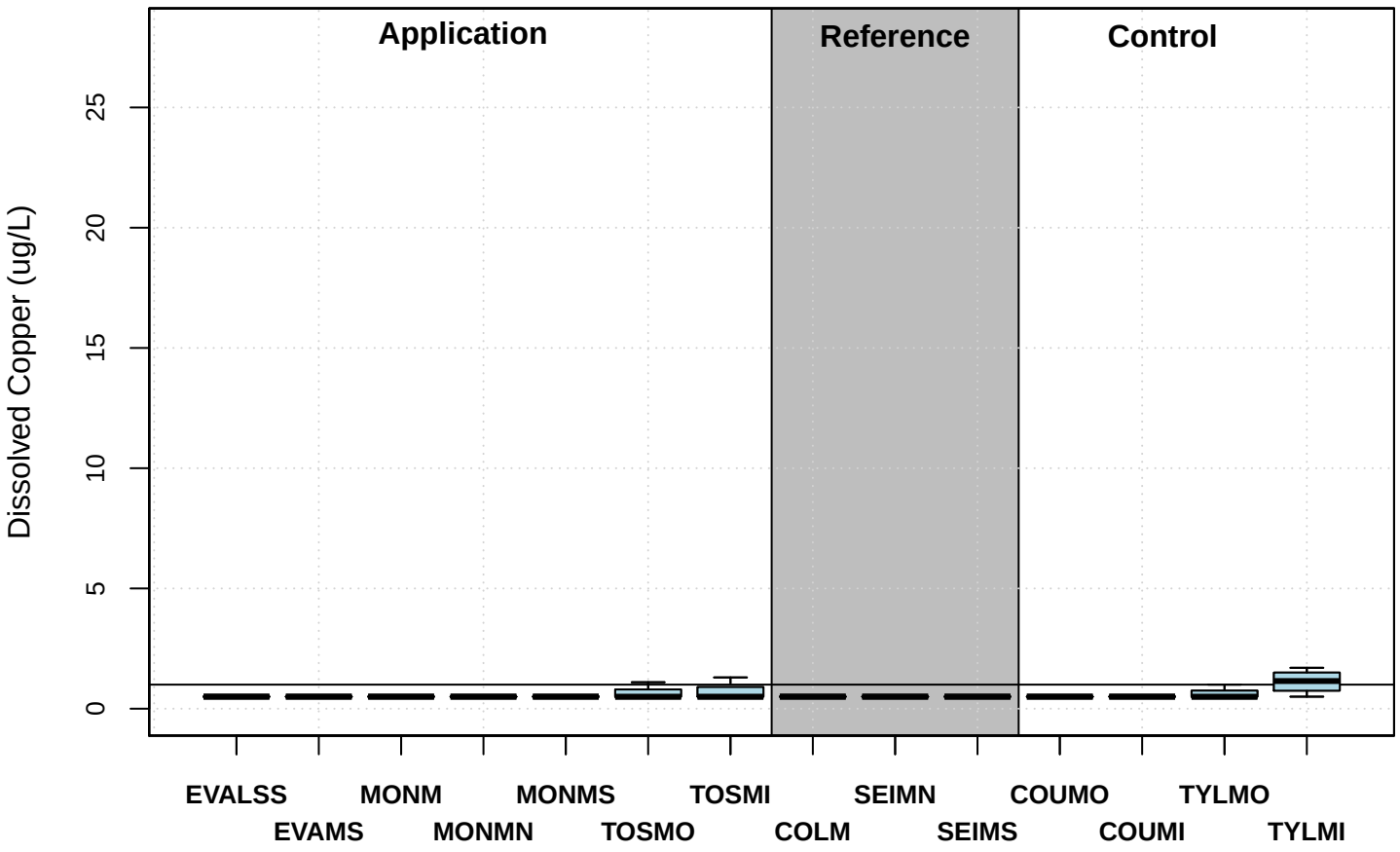
Base Flow



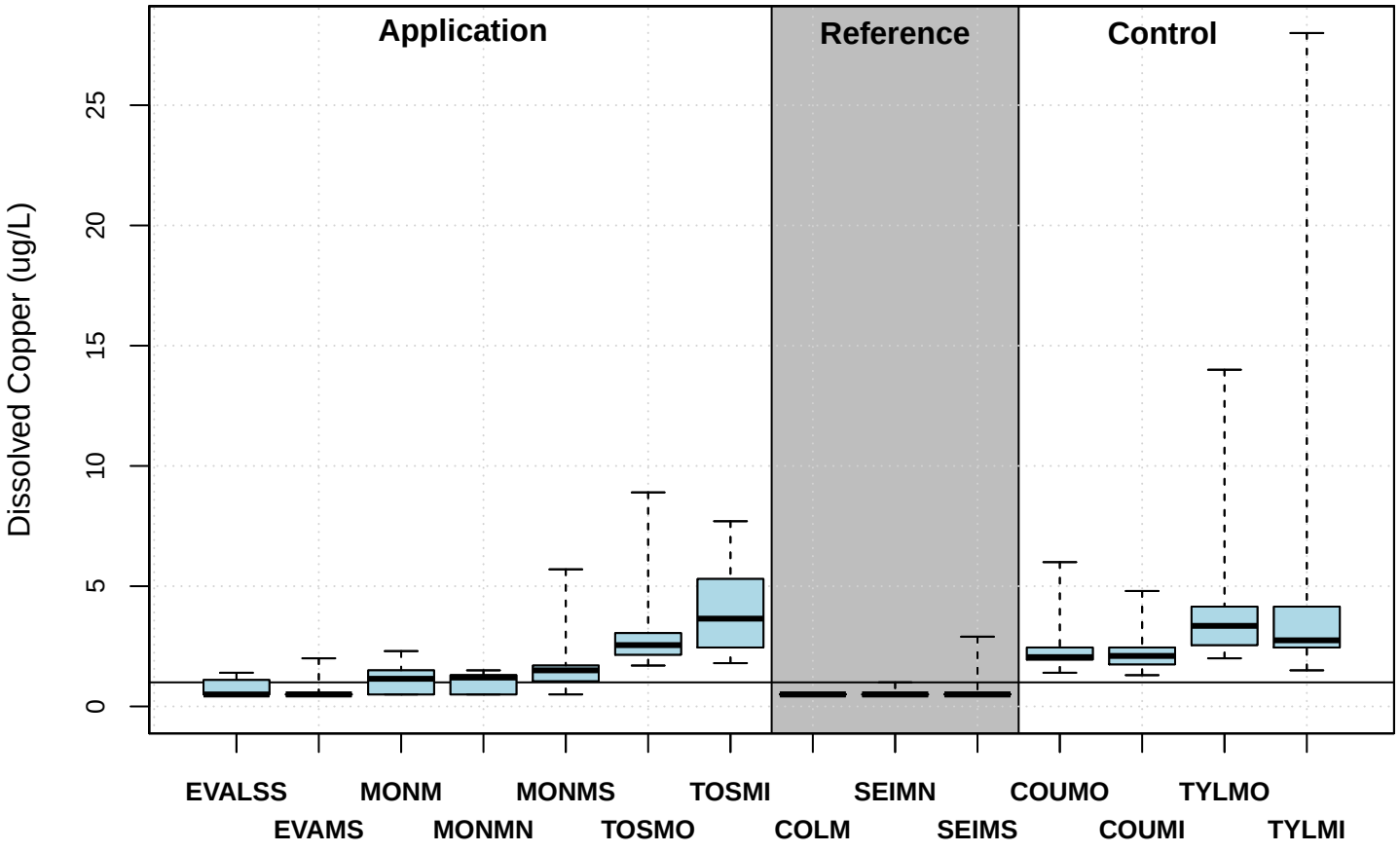
Storm Events



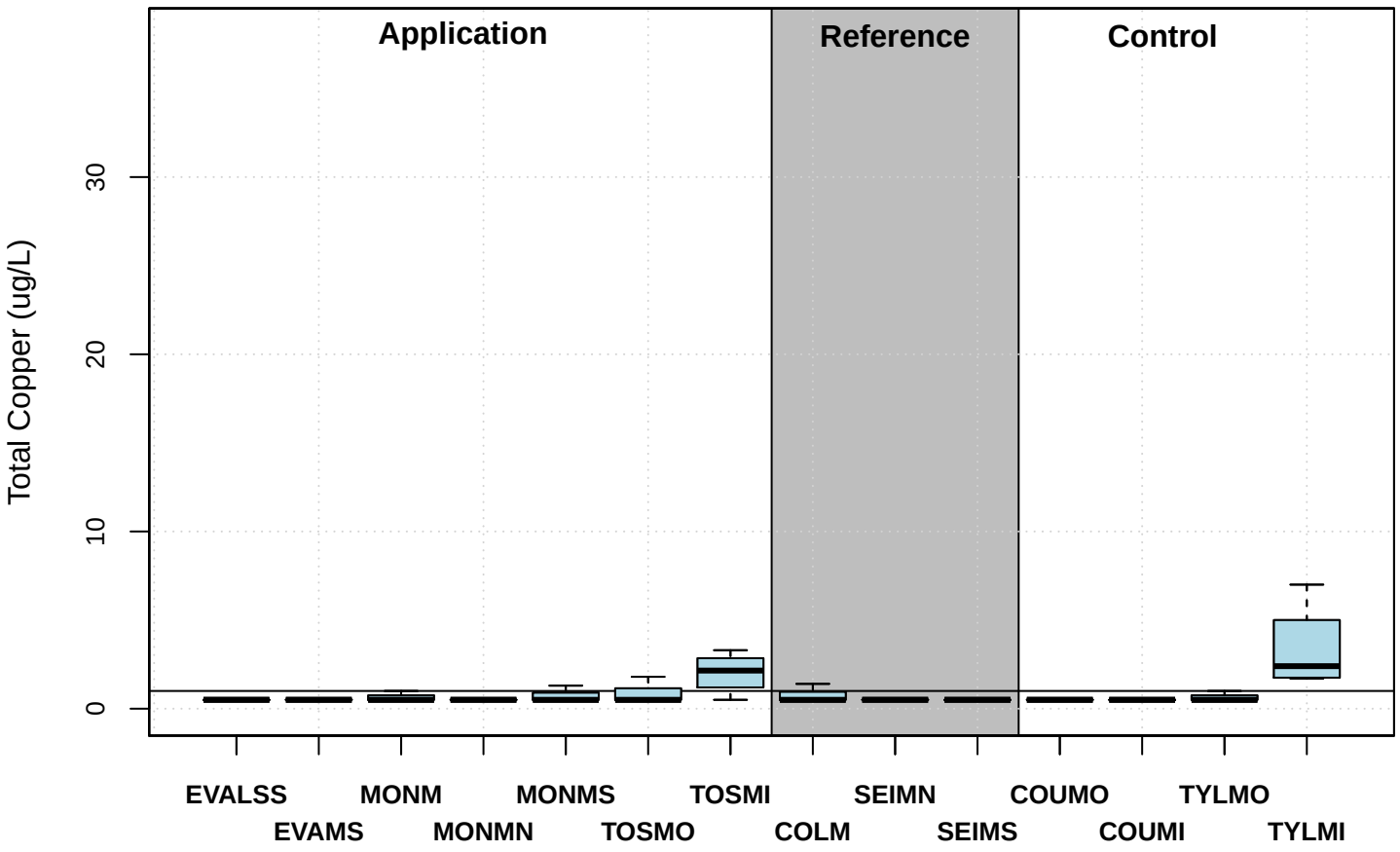
Base Flow



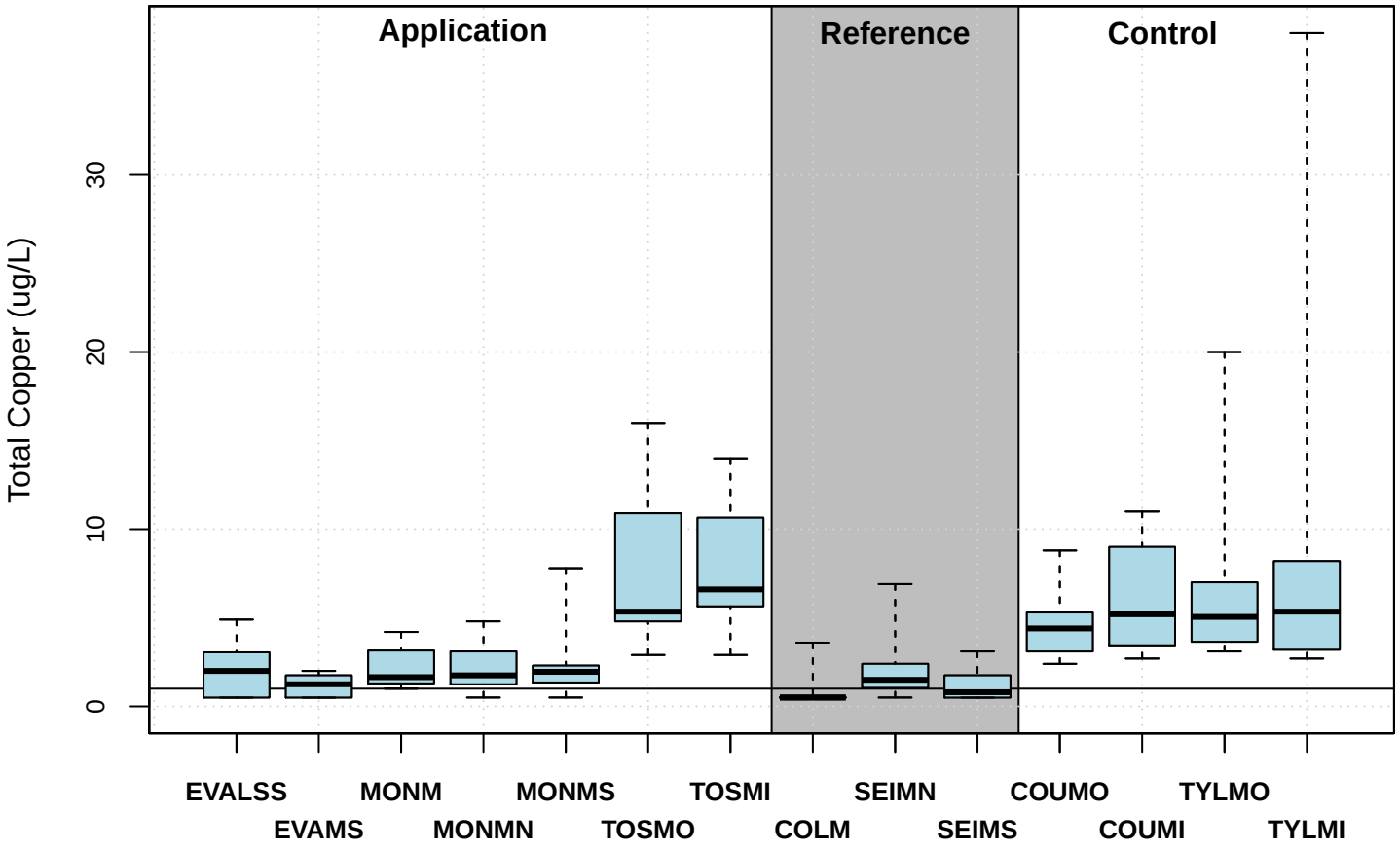
Storm Events



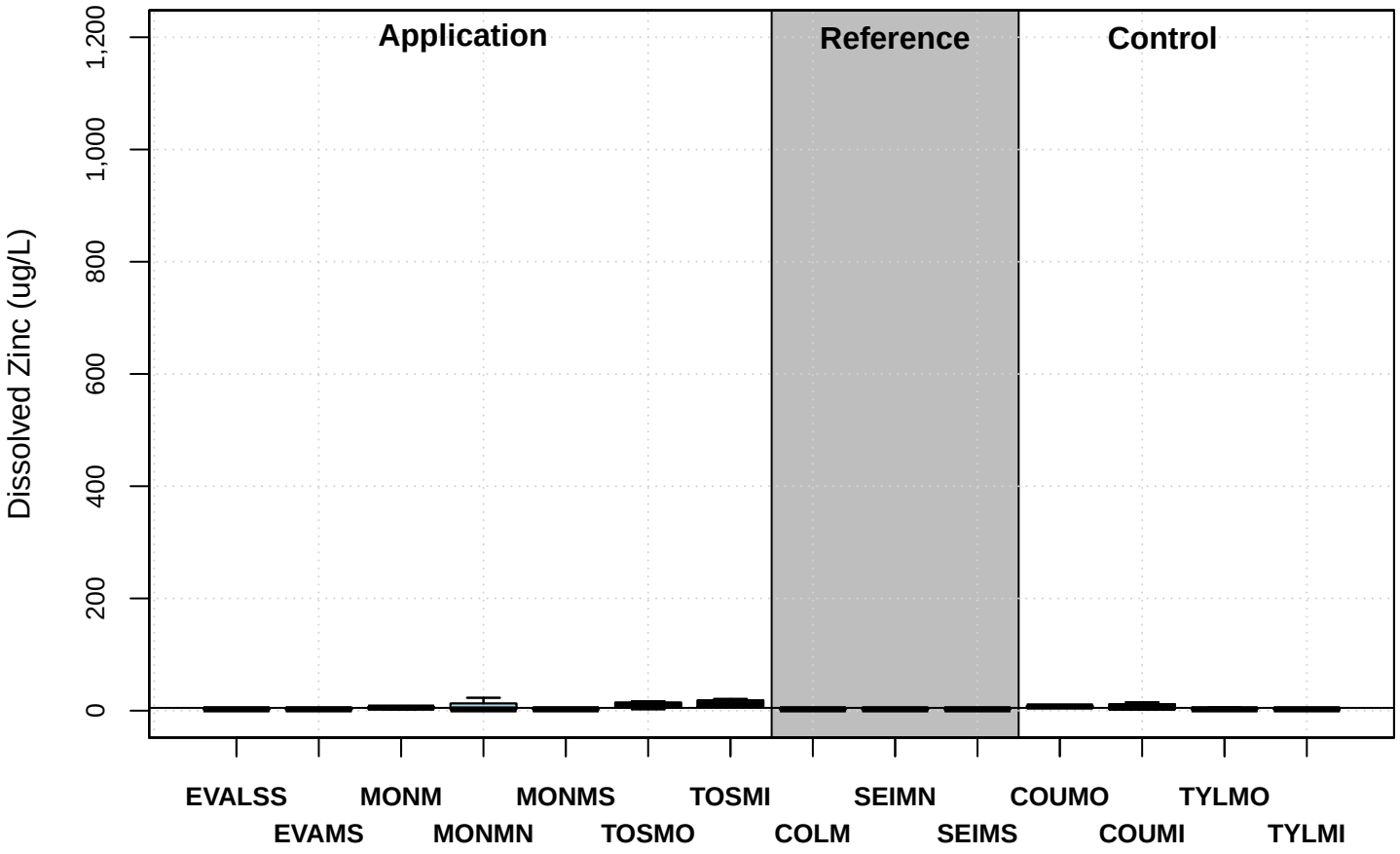
Base Flow



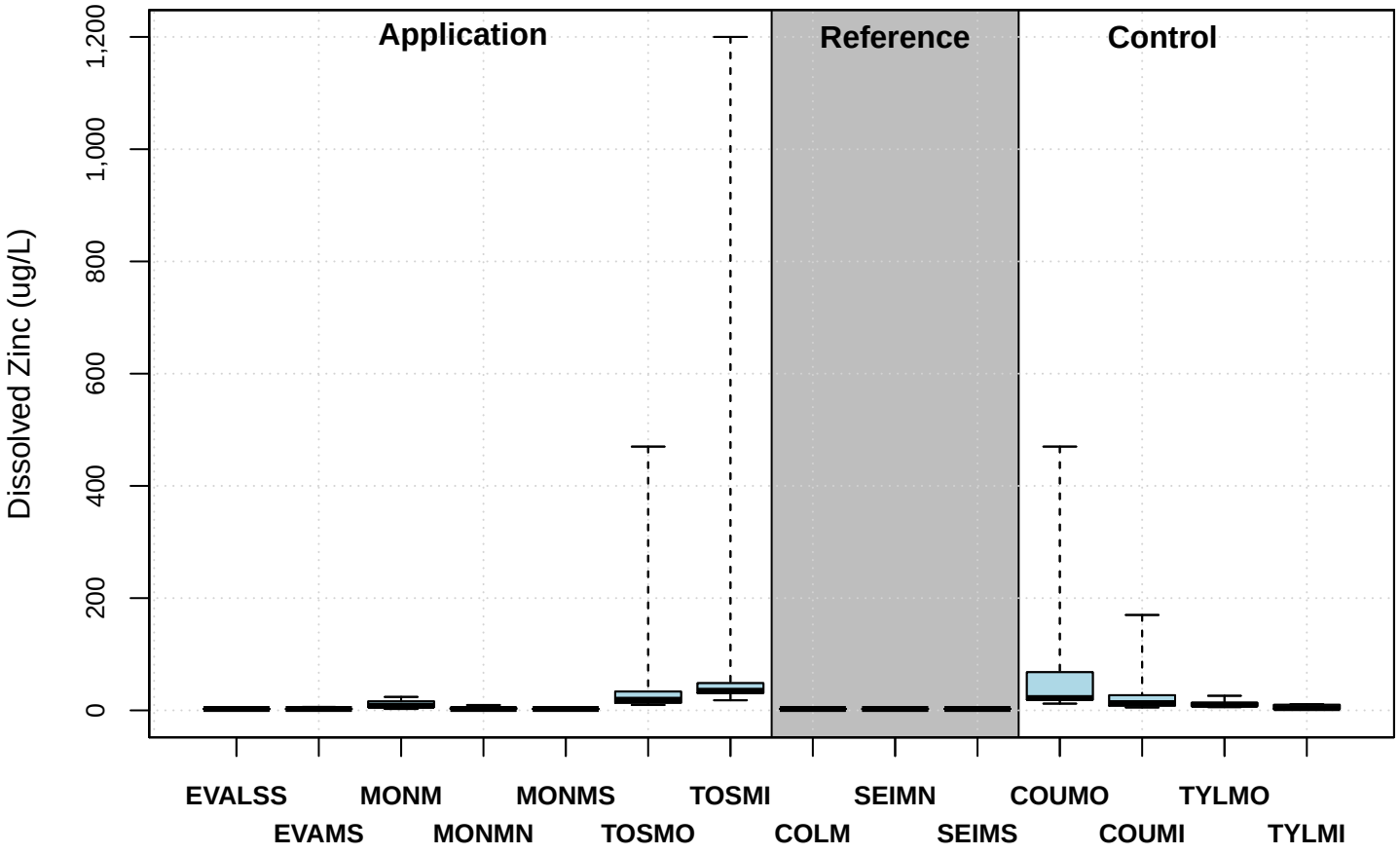
Storm Events



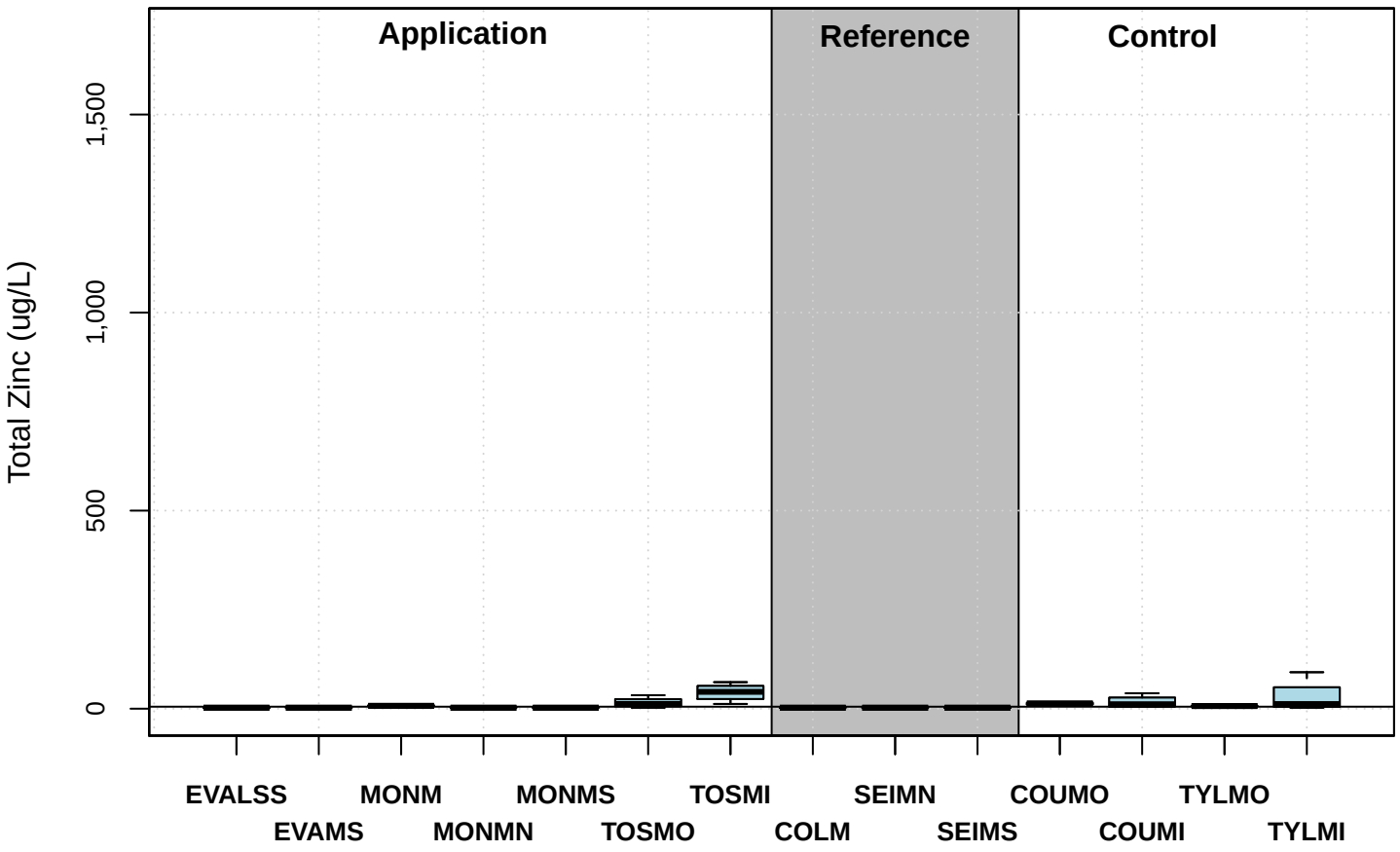
Base Flow



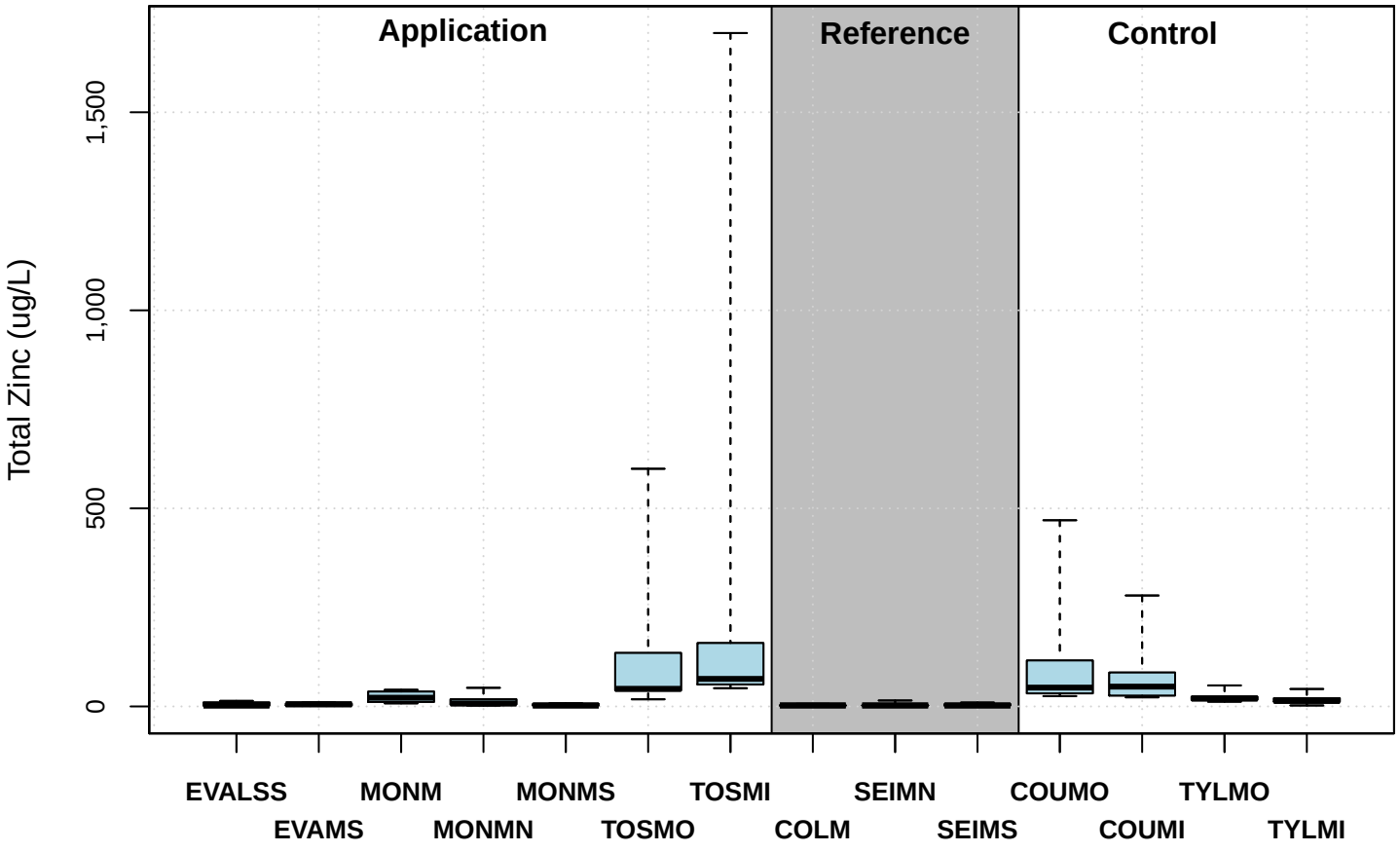
Storm Events



Base Flow



Storm Events



APPENDIX J

Line Plots Showing Continuous Temperature Data

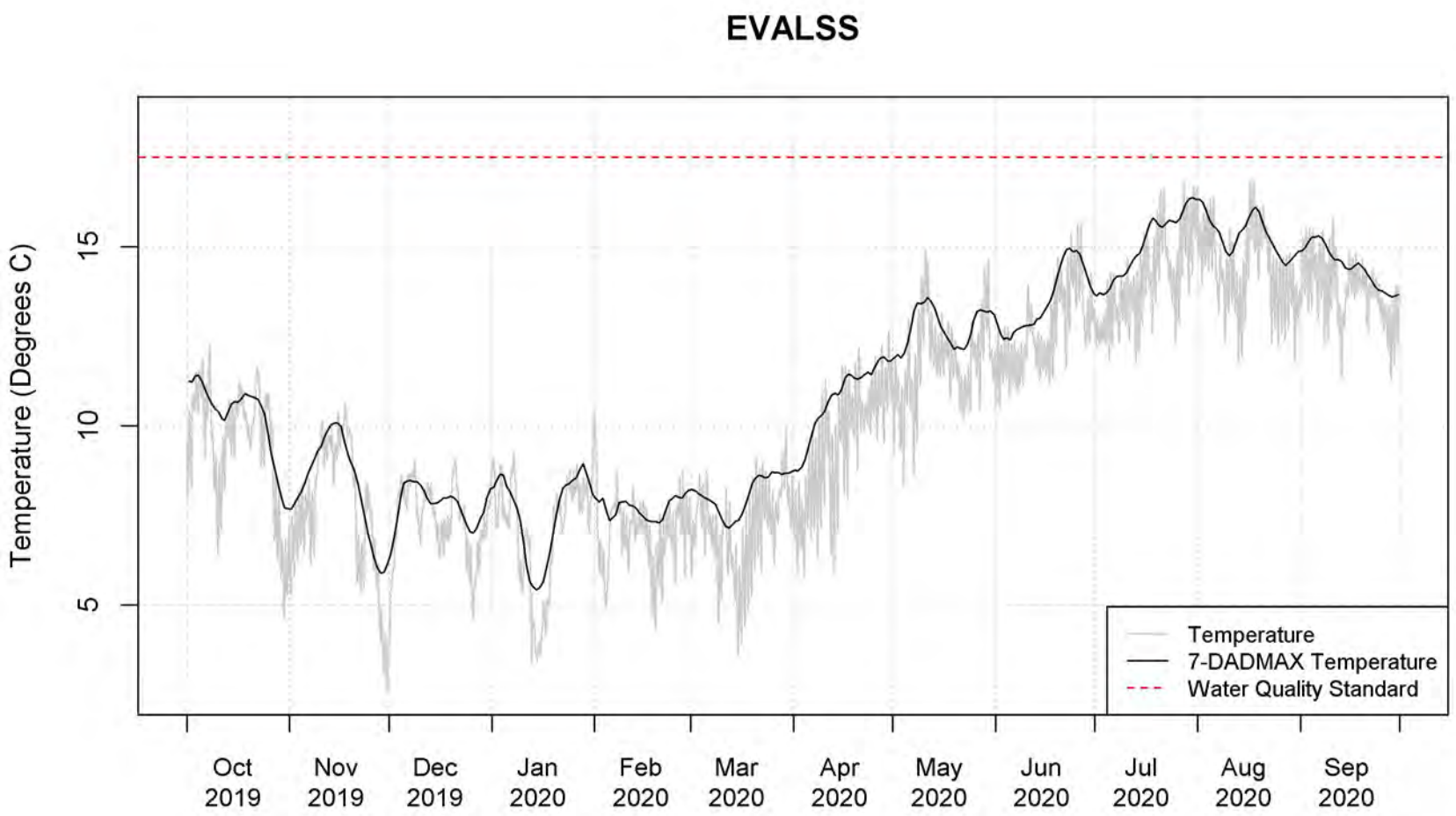


Figure J-1. Continuous Temperature and 7-DADMAX Measured at the EVALSS Station.

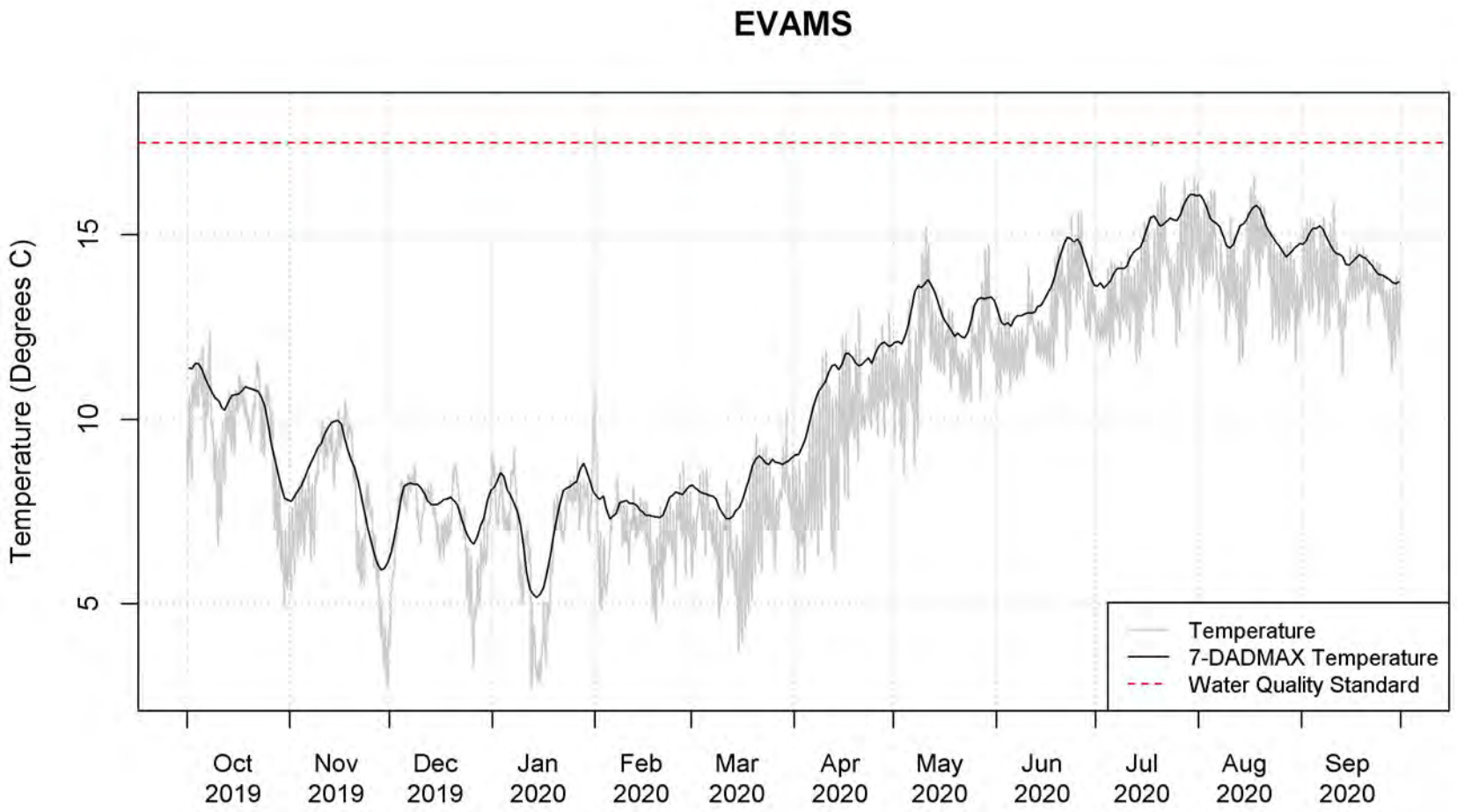


Figure J-2. Continuous Temperature and 7-DADMAX Measured at the EVAMS Station.

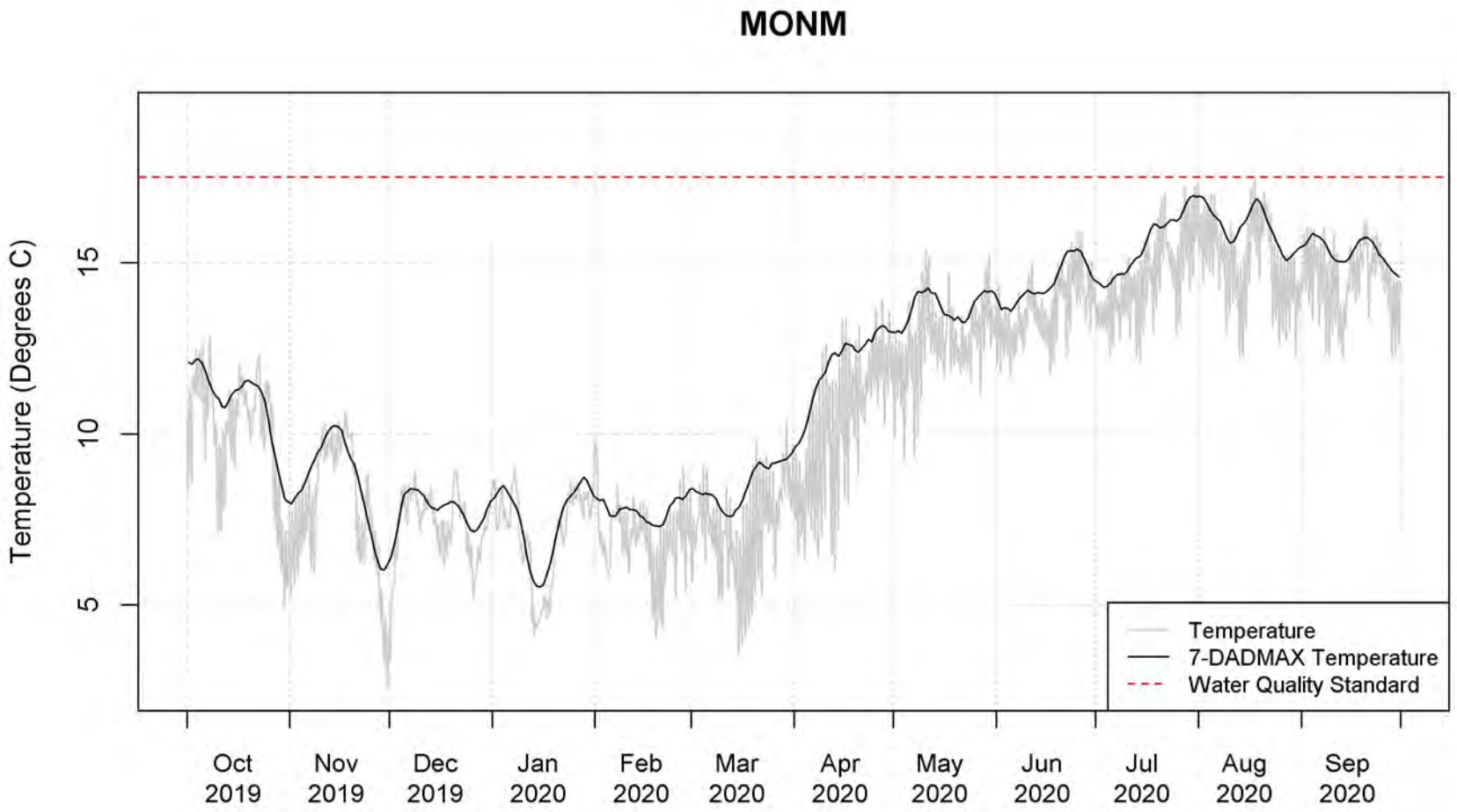


Figure J-3. Continuous Temperature and 7-DADMAX Measured at the MONM Station.

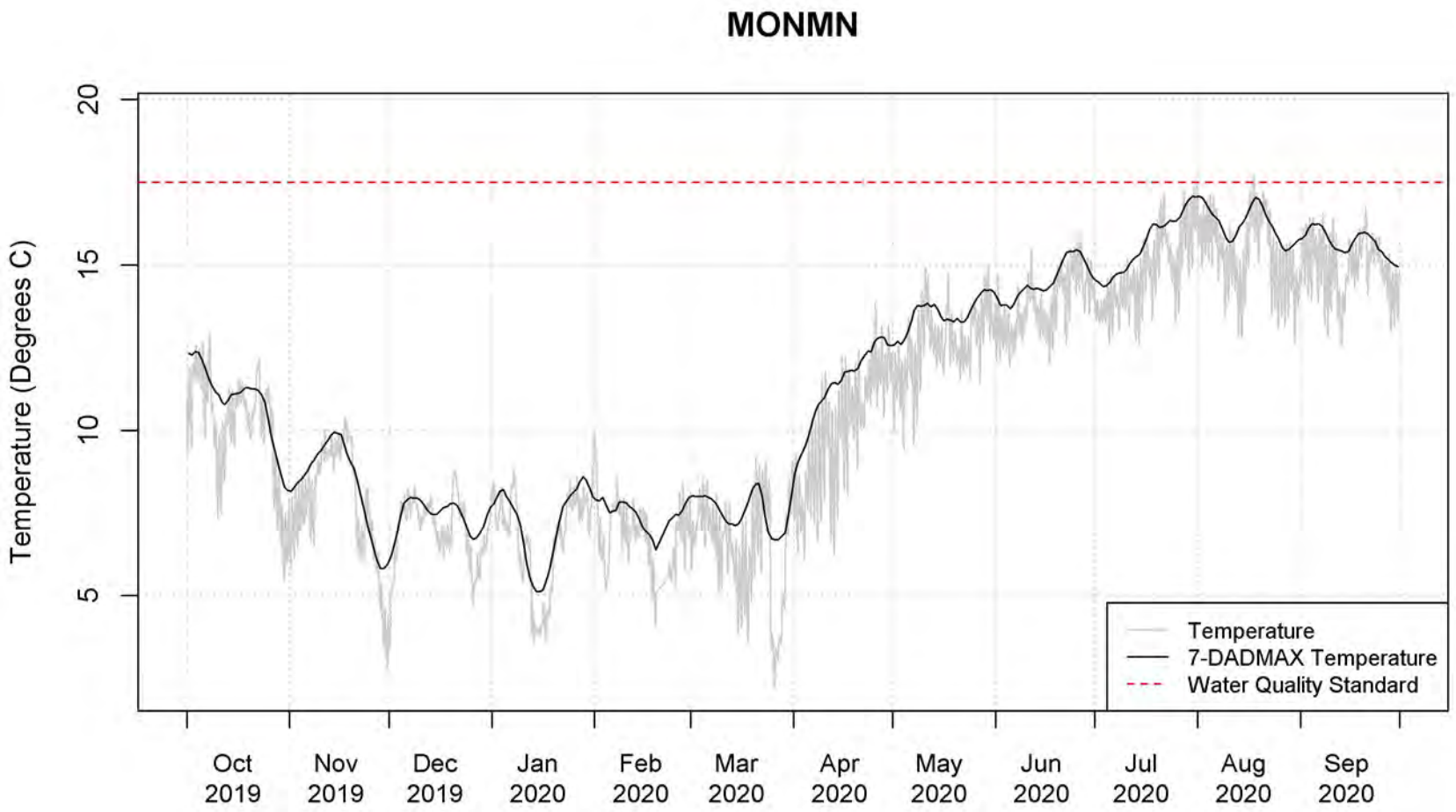


Figure J-4. Continuous Temperature and 7-DADMAX Measured at the MONMN Station.

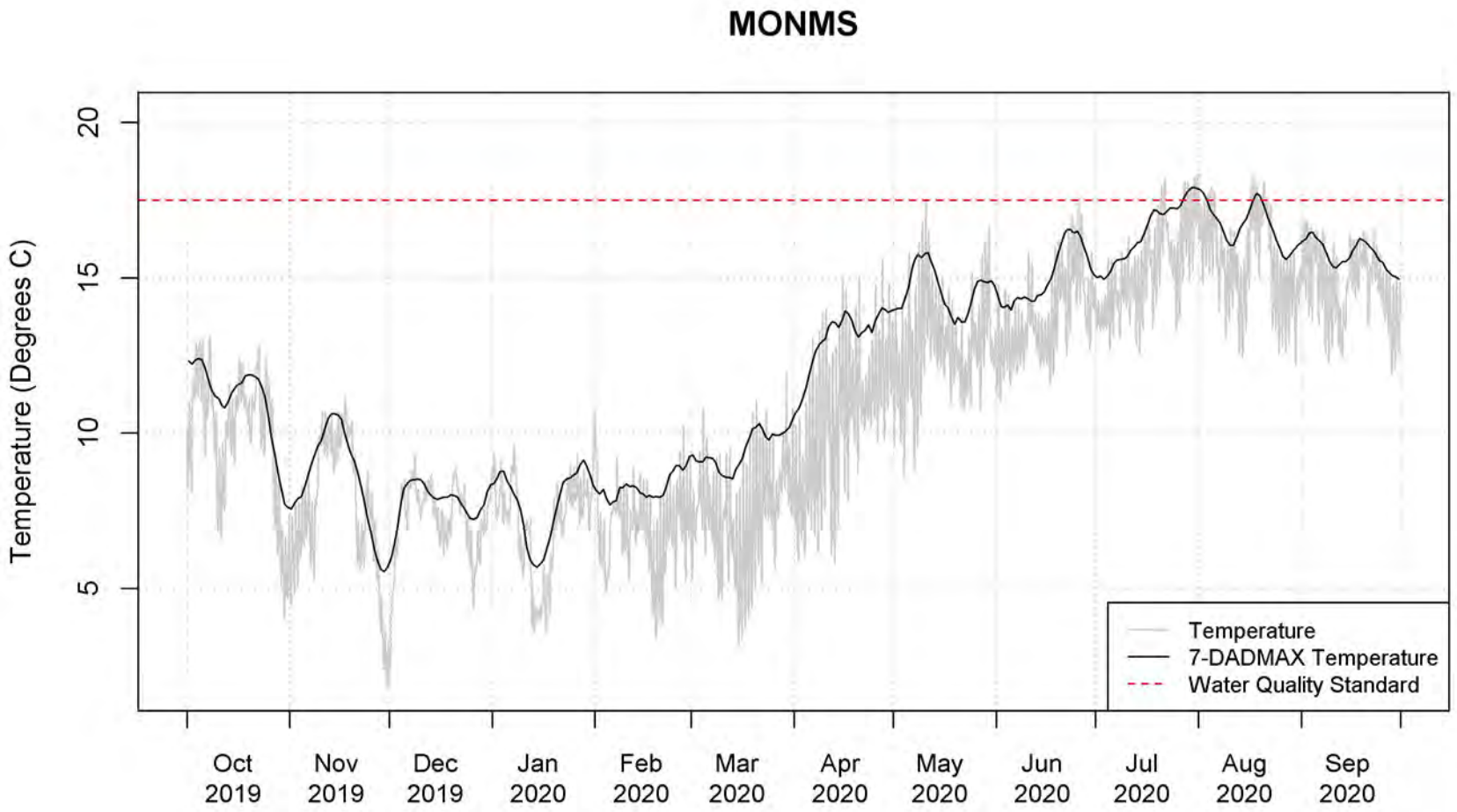


Figure J-5. Continuous Temperature and 7-DADMAX Measured at the MONMS Station.

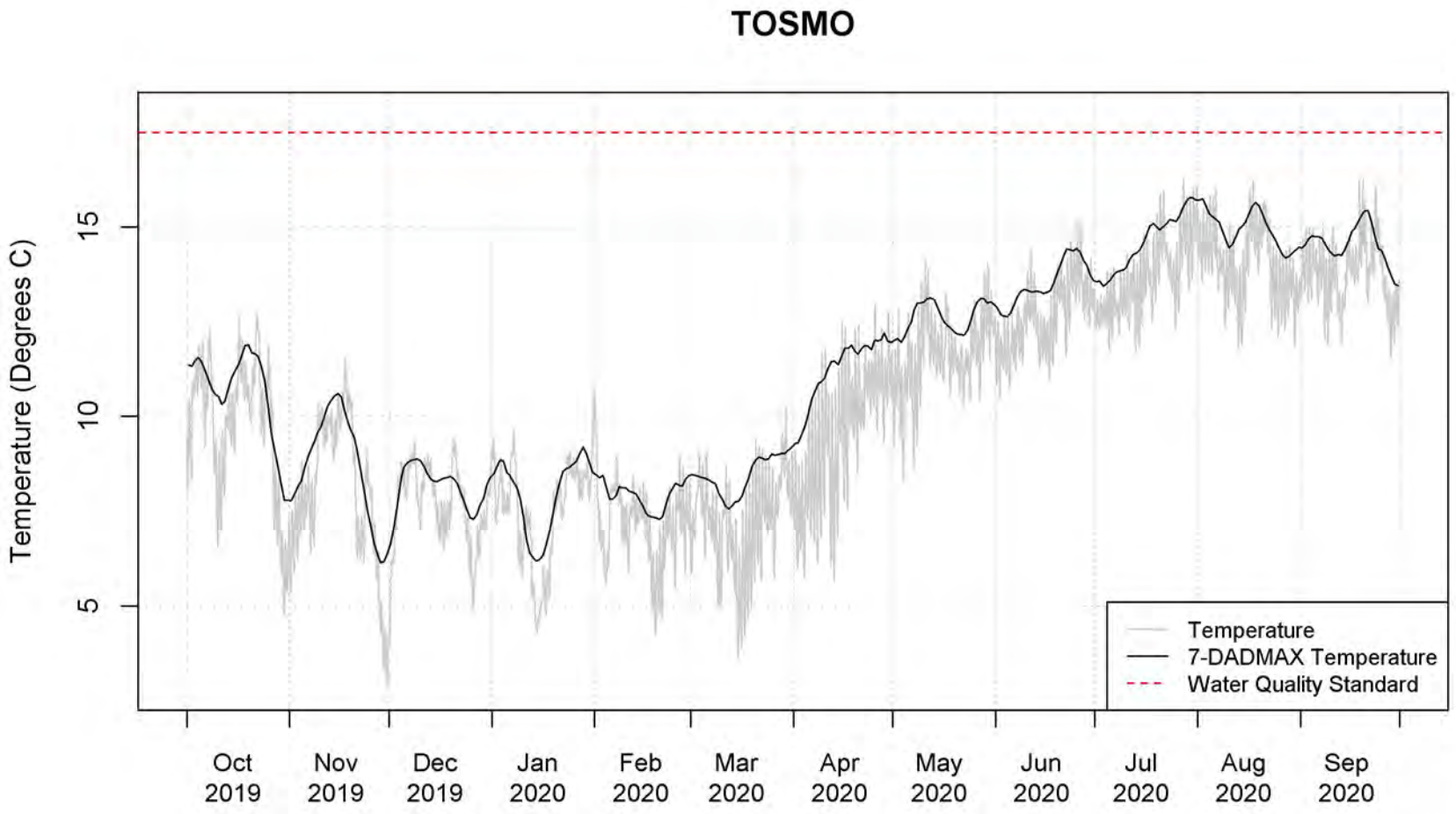


Figure J-6. Continuous Temperature and 7-DADMAX Measured at the TOSMO Station.

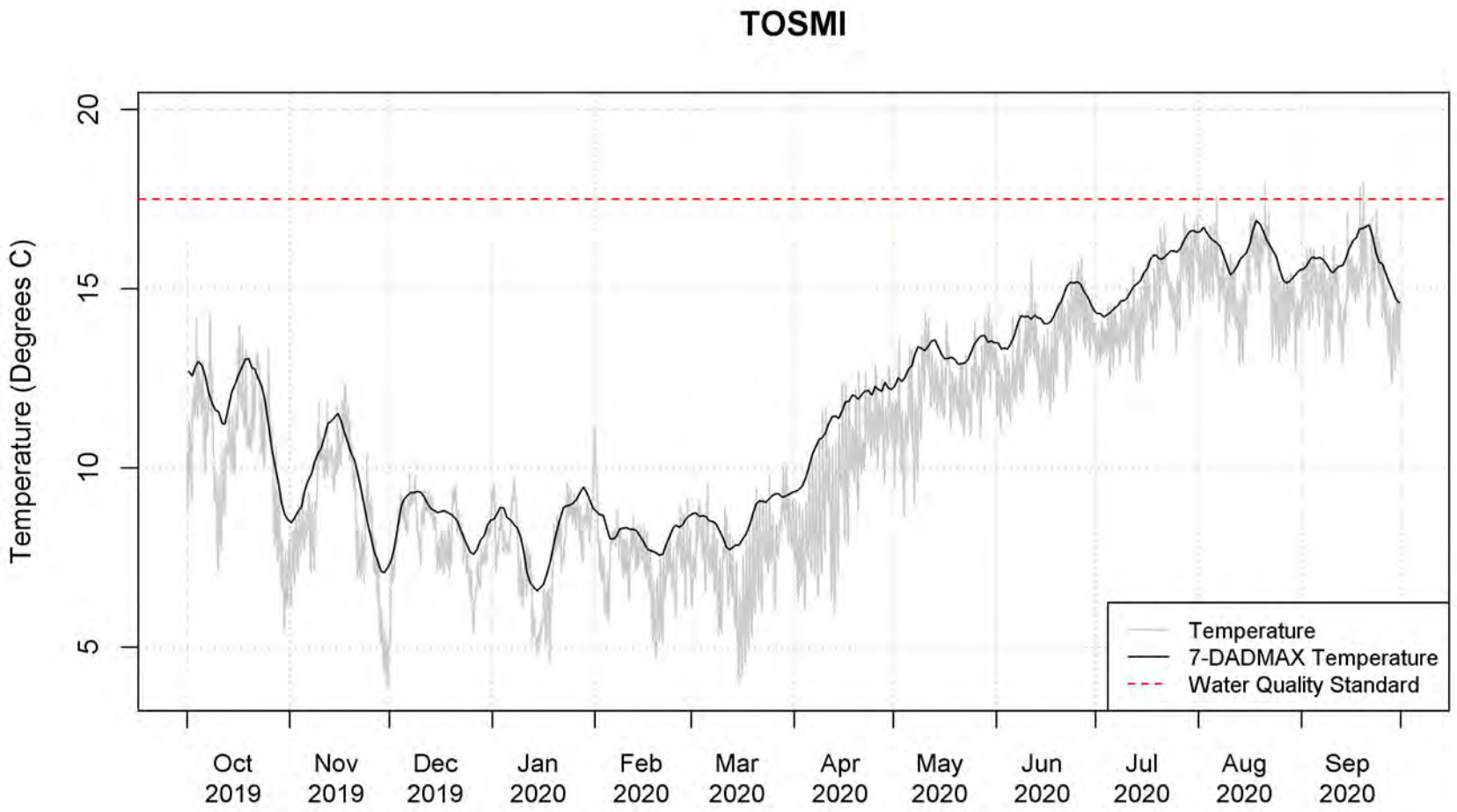


Figure J-7. Continuous Temperature and 7-DADMAX Measured at the TOSMI Station.

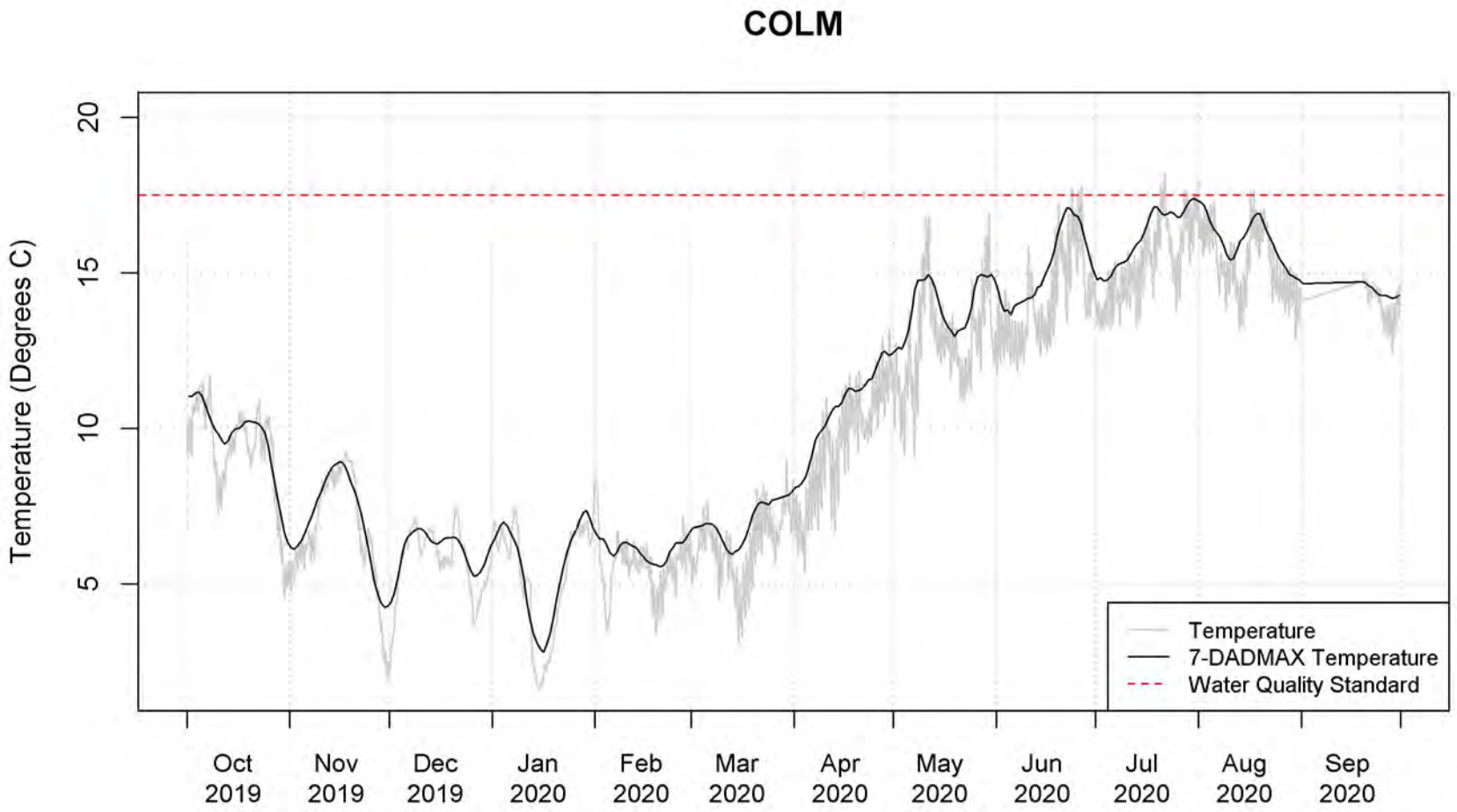


Figure J-8. Continuous Temperature and 7-DADMAX Measured at the COLM Station.

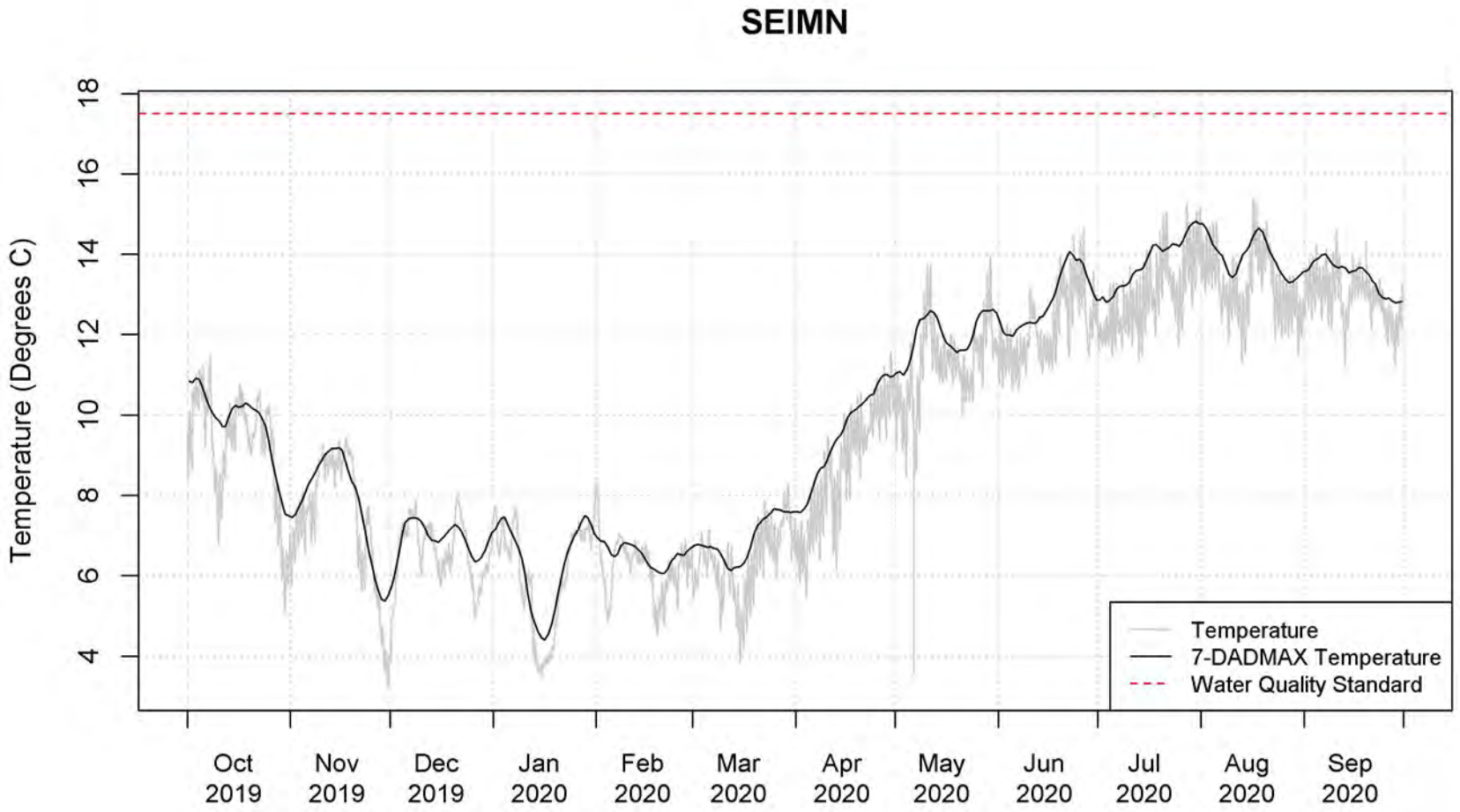


Figure J-9. Continuous Temperature and 7-DADMAX Measured at the SEIMN Station.

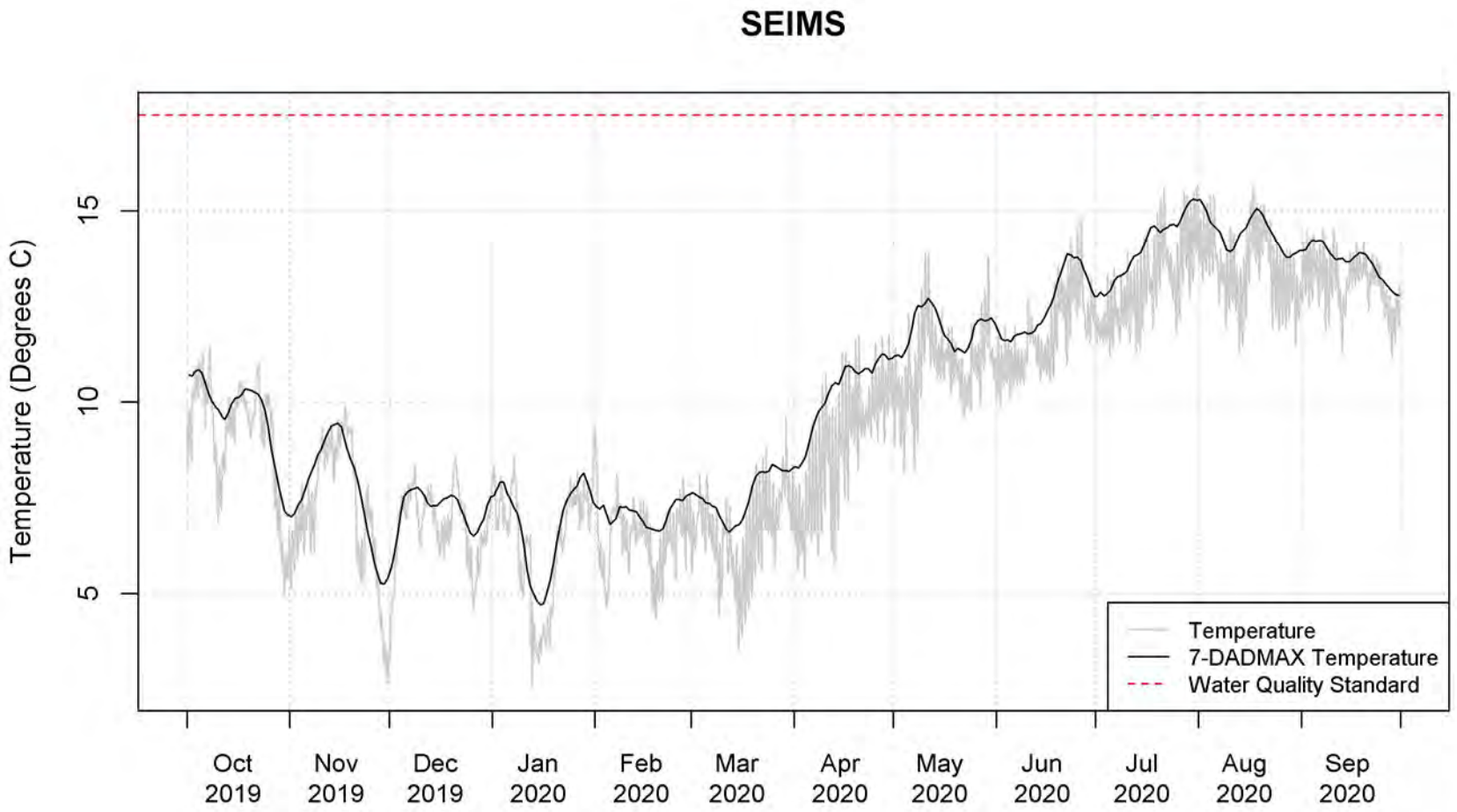


Figure J-10. Continuous Temperature and 7-DADMAX Measured at the SEIMS Station.

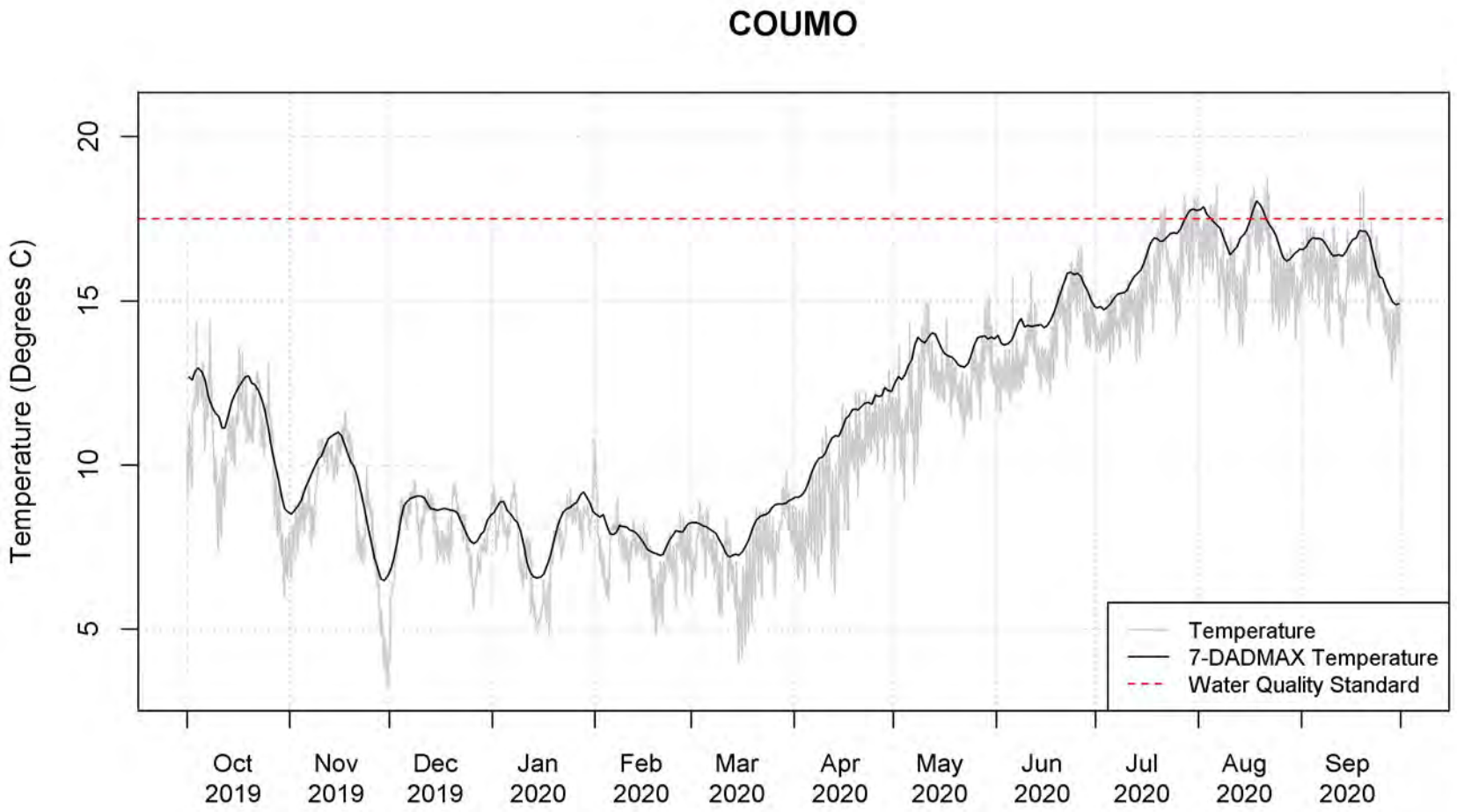


Figure J-11. Continuous Temperature and 7-DADMAX Measured at the COUMO Station.

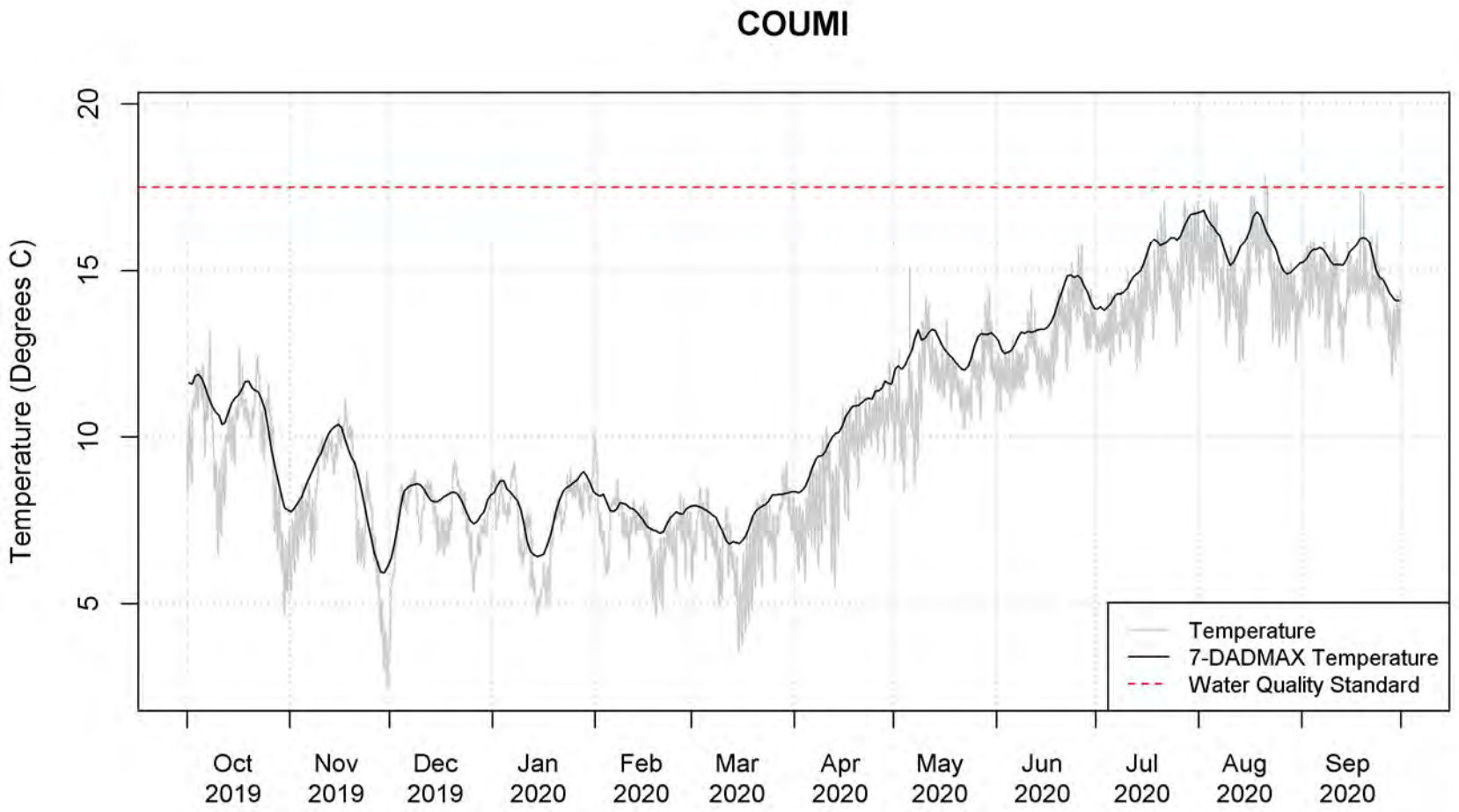


Figure J-12. Continuous Temperature and 7-DADMAX Measured at the COUMI Station.

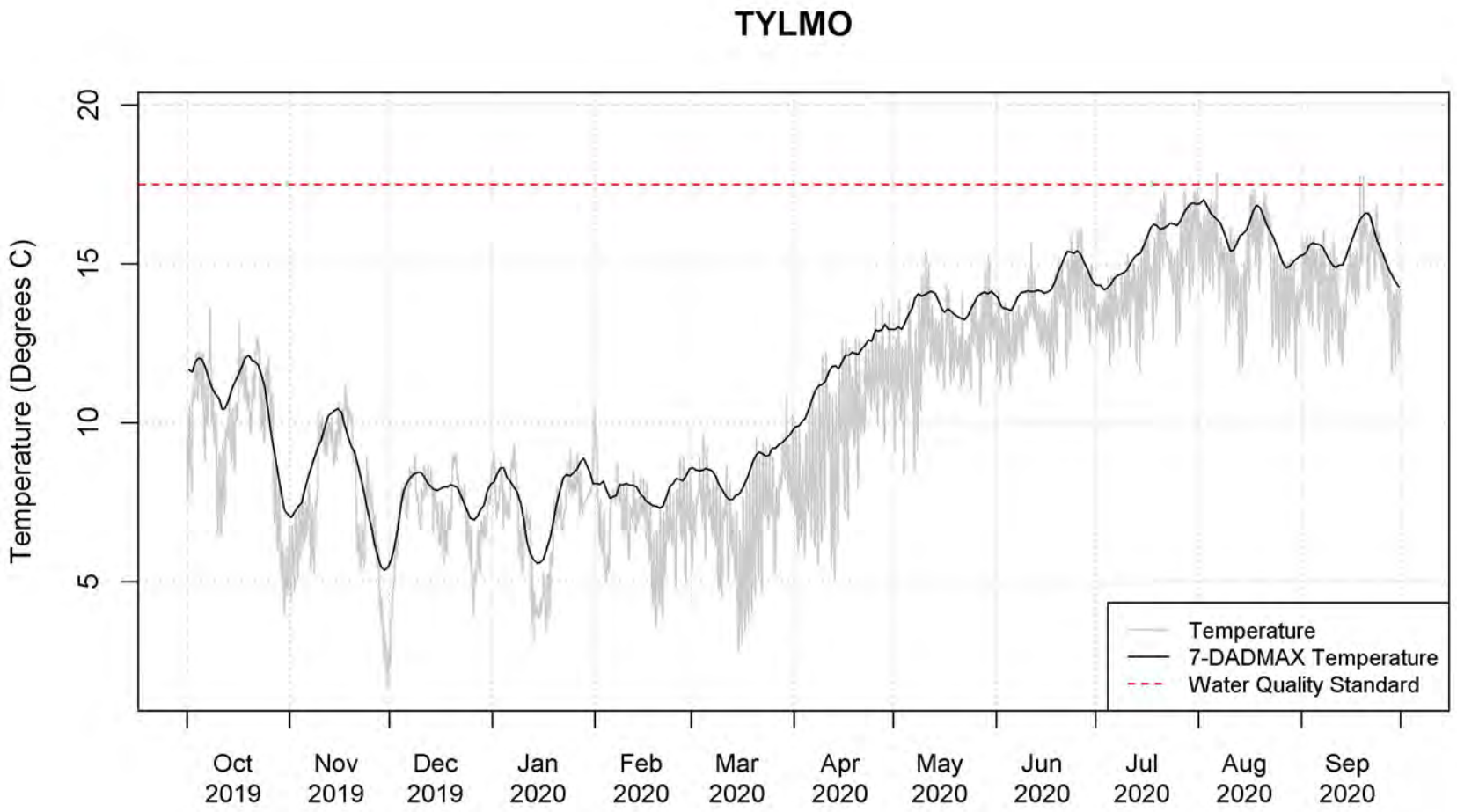


Figure J-13. Continuous Temperature and 7-DADMAX Measured at the TYLMO Station.

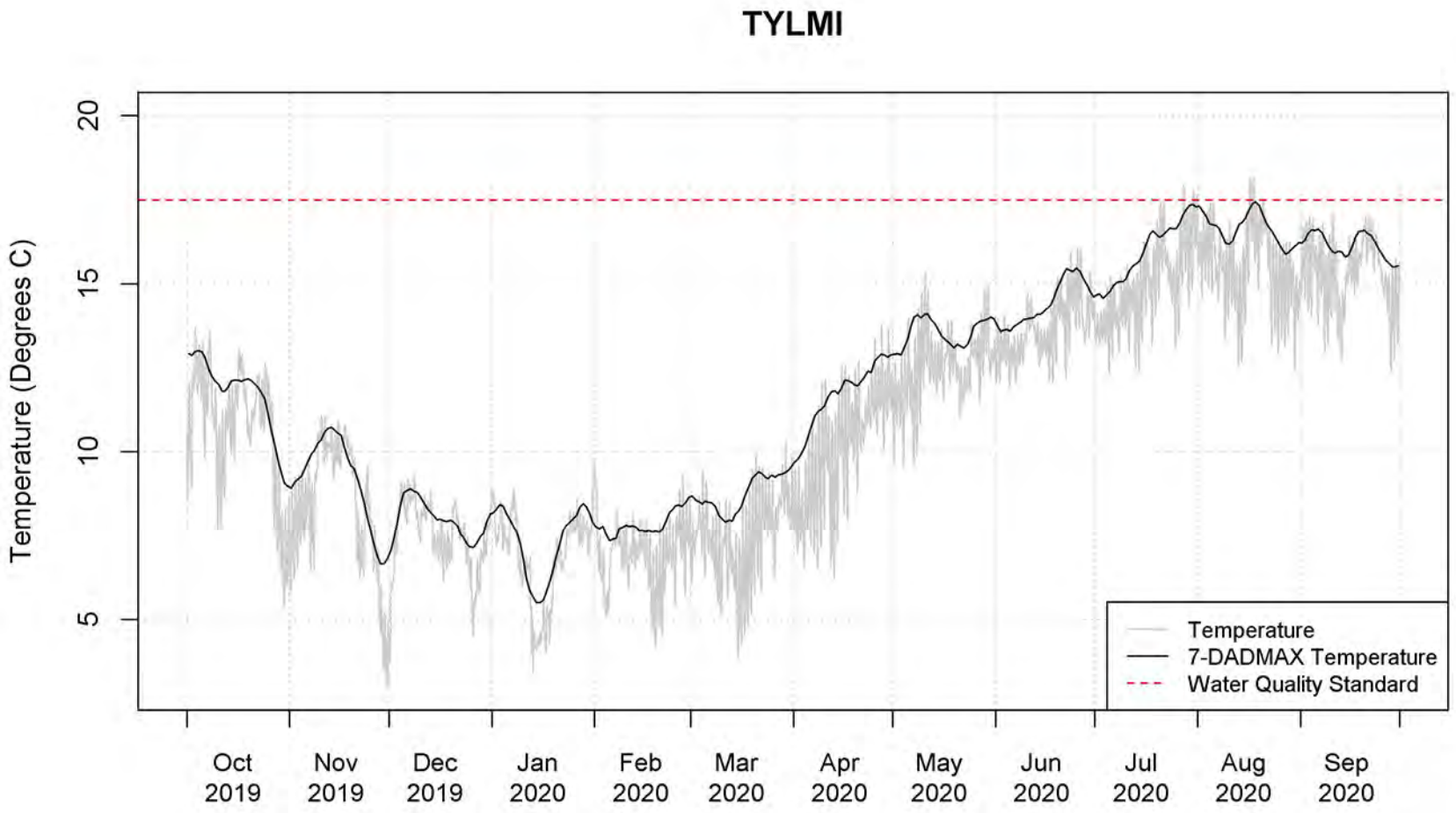


Figure J-14. Continuous Temperature and 7-DADMAX Measured at the TYLMI Station.

APPENDIX K

Line Plots Showing Continuous Conductivity Data

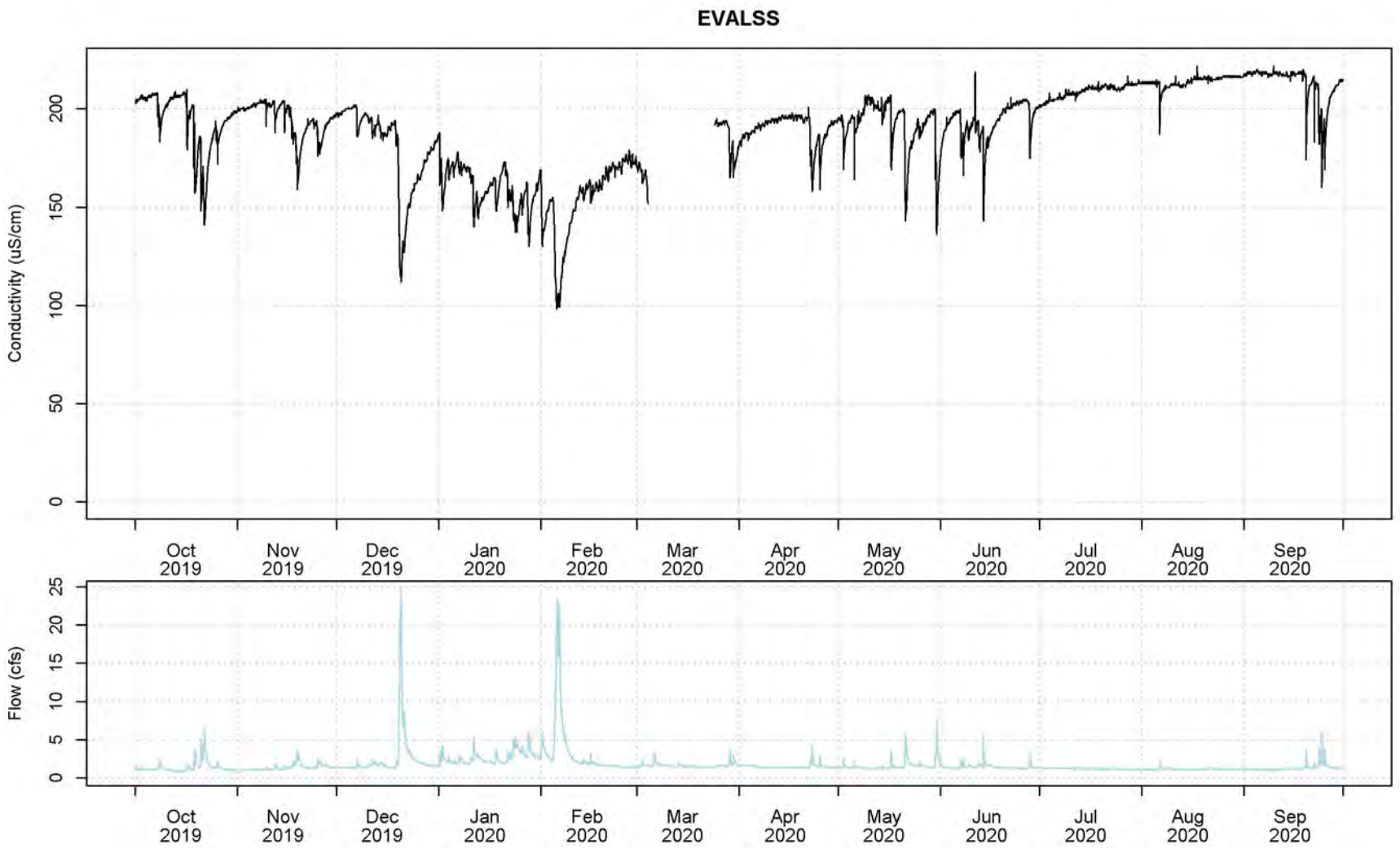


Figure K-1. Continuous Conductivity Measured at the EVALSS Station.

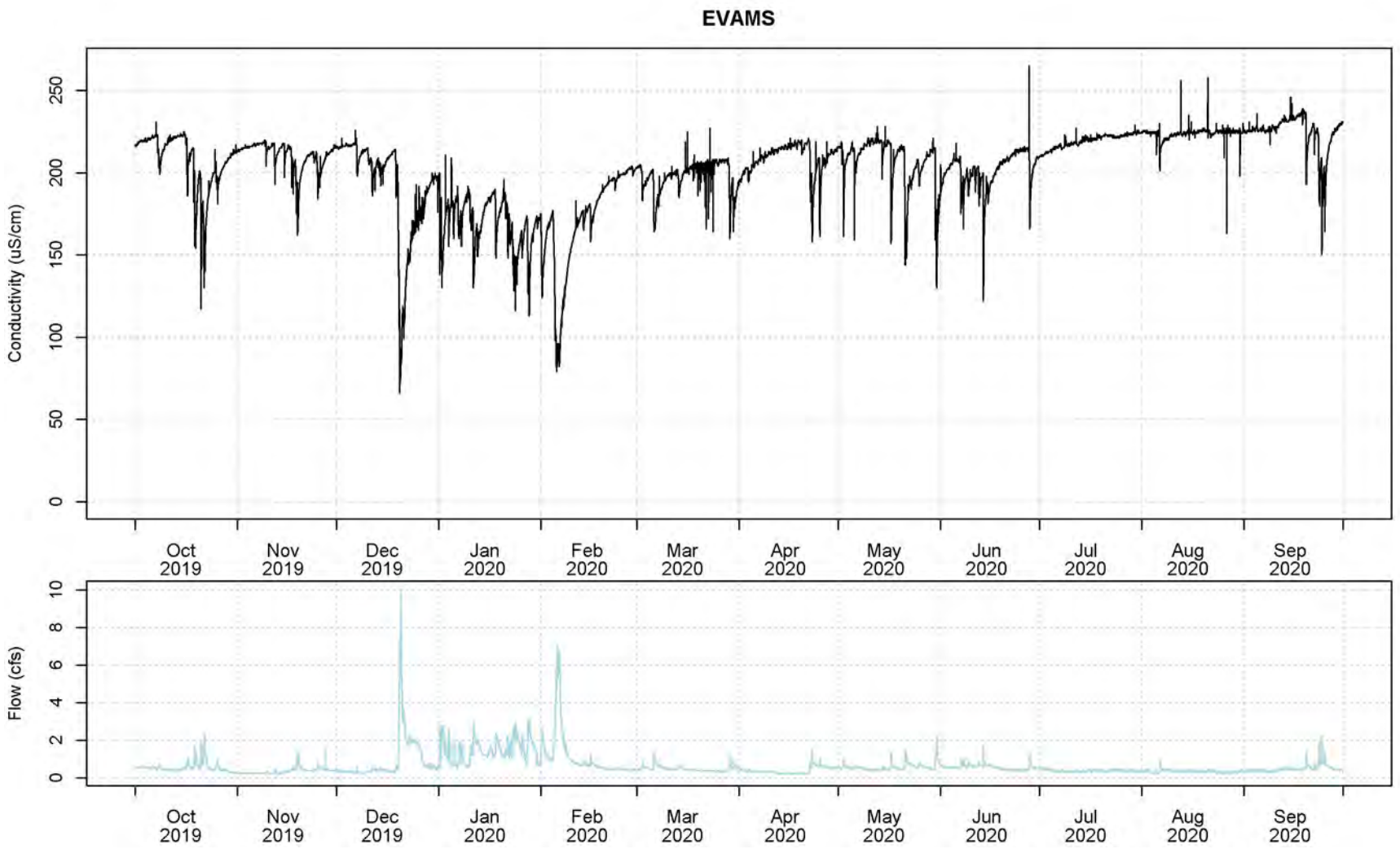


Figure K-2. Continuous Conductivity Measured at the EVAMS Station.

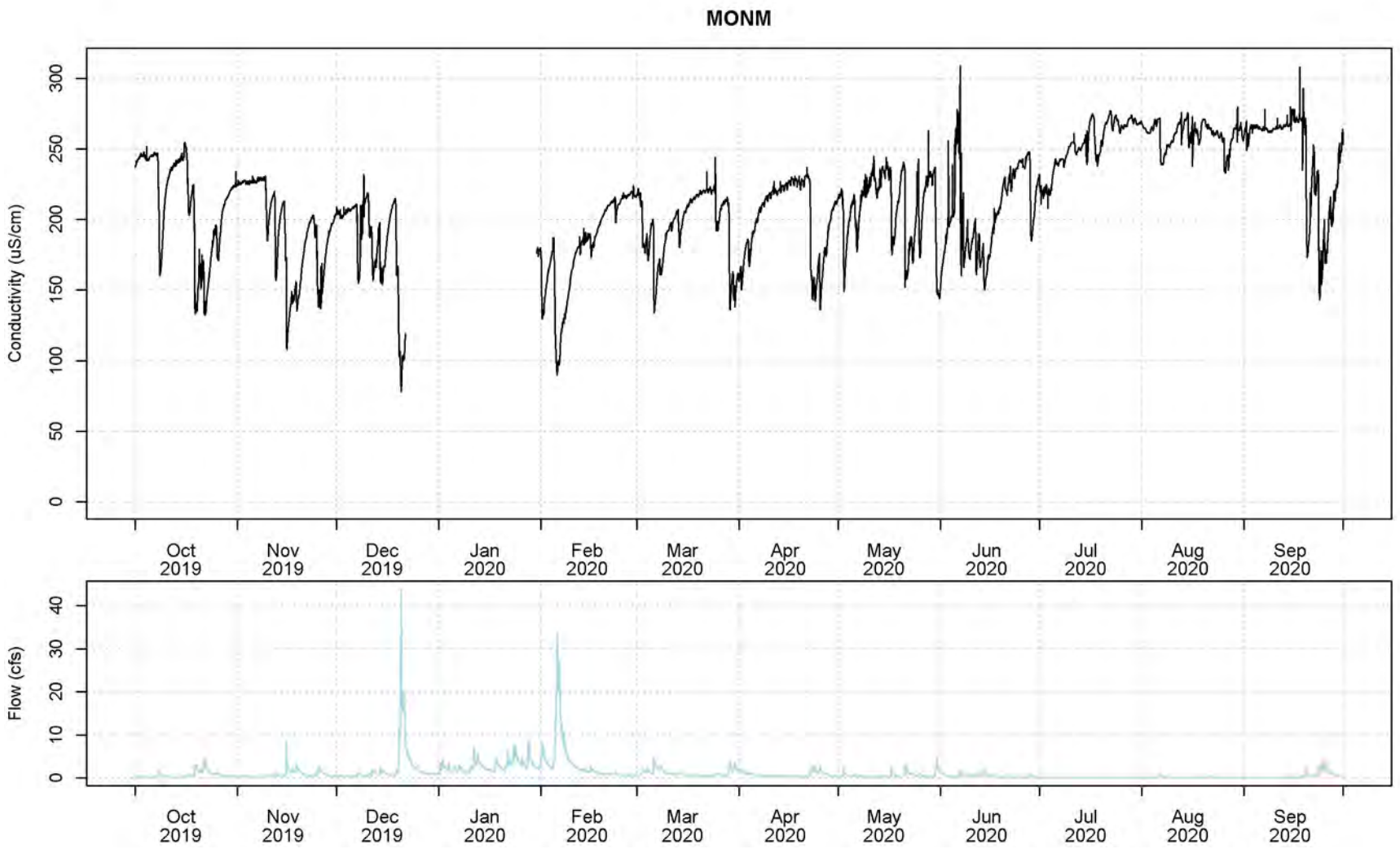


Figure K-3. Continuous Conductivity Measured at the MONM Station.

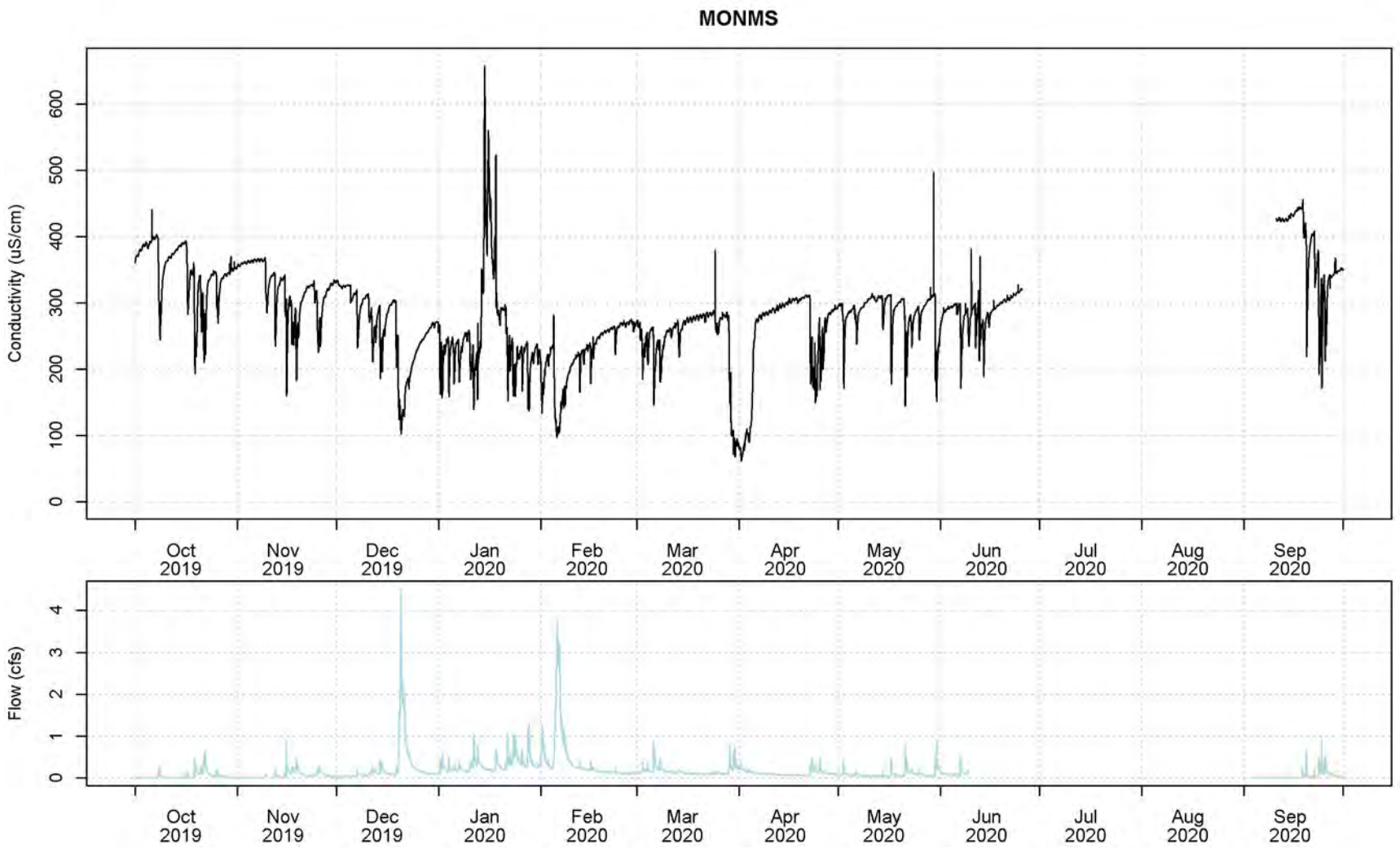


Figure K-4. Continuous Conductivity Measured at the MONMS Station.

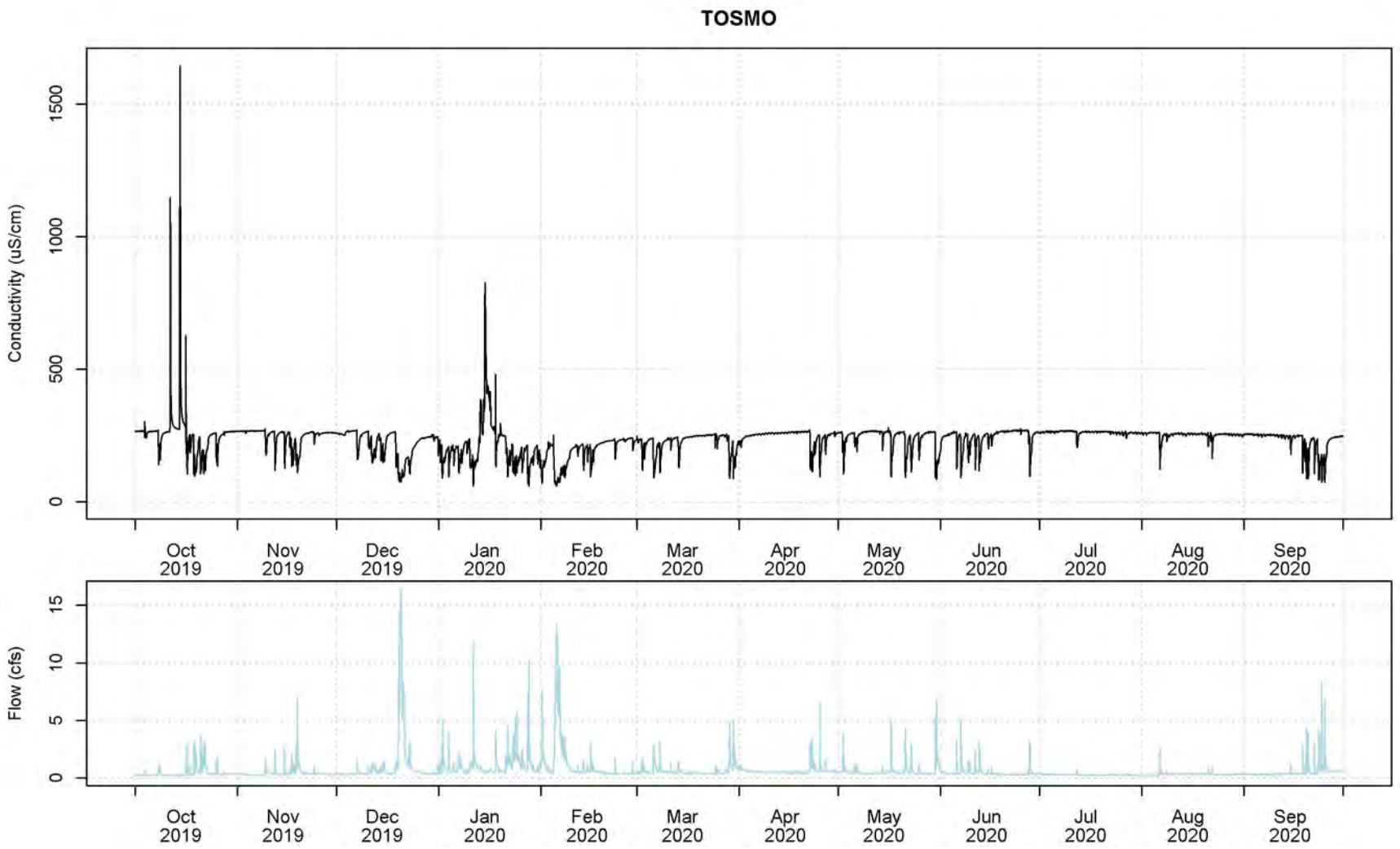


Figure K-5. Continuous Conductivity Measured at the TOSMO Station.

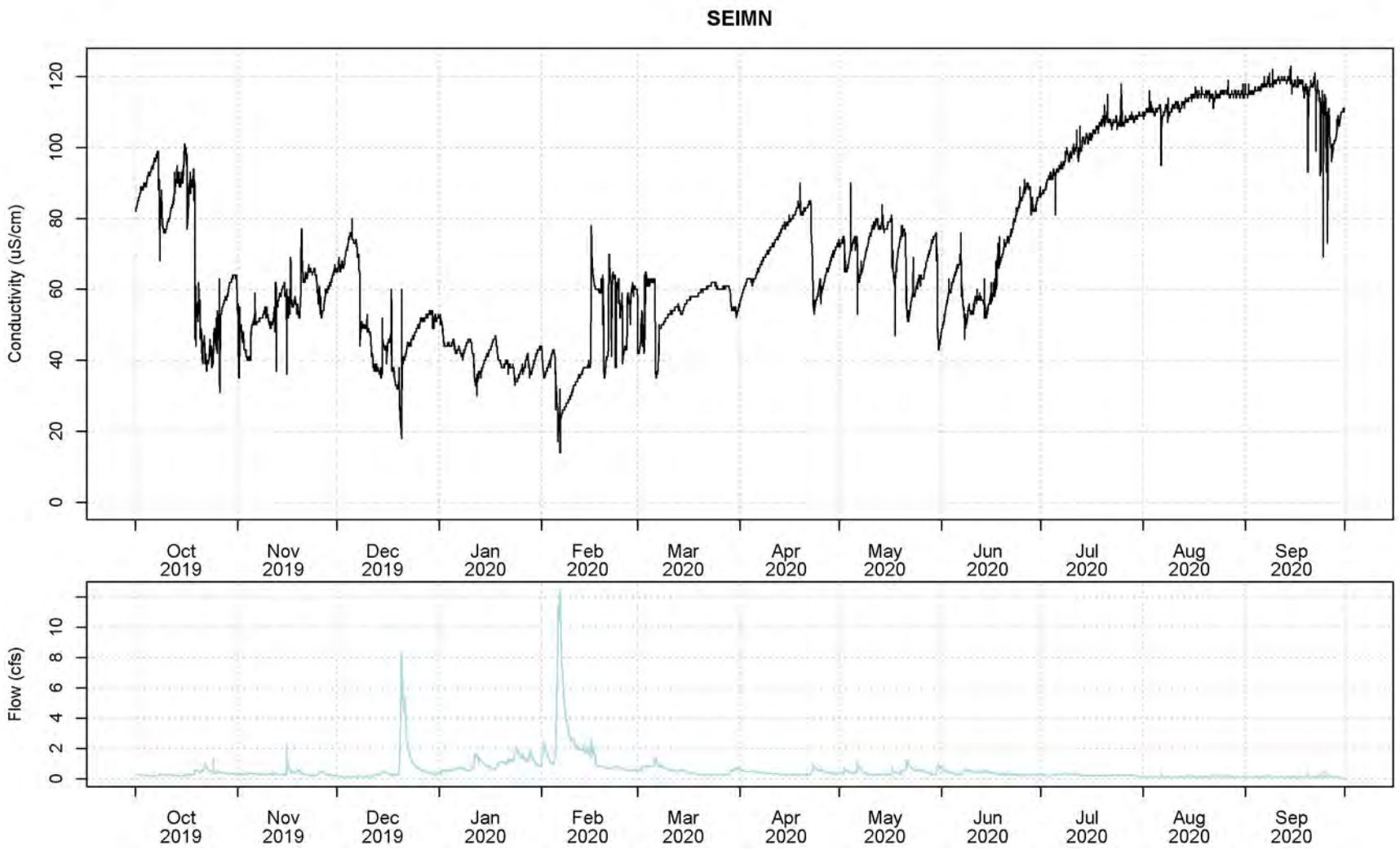


Figure K-6. Continuous Conductivity Measured at the SEIMN Station.

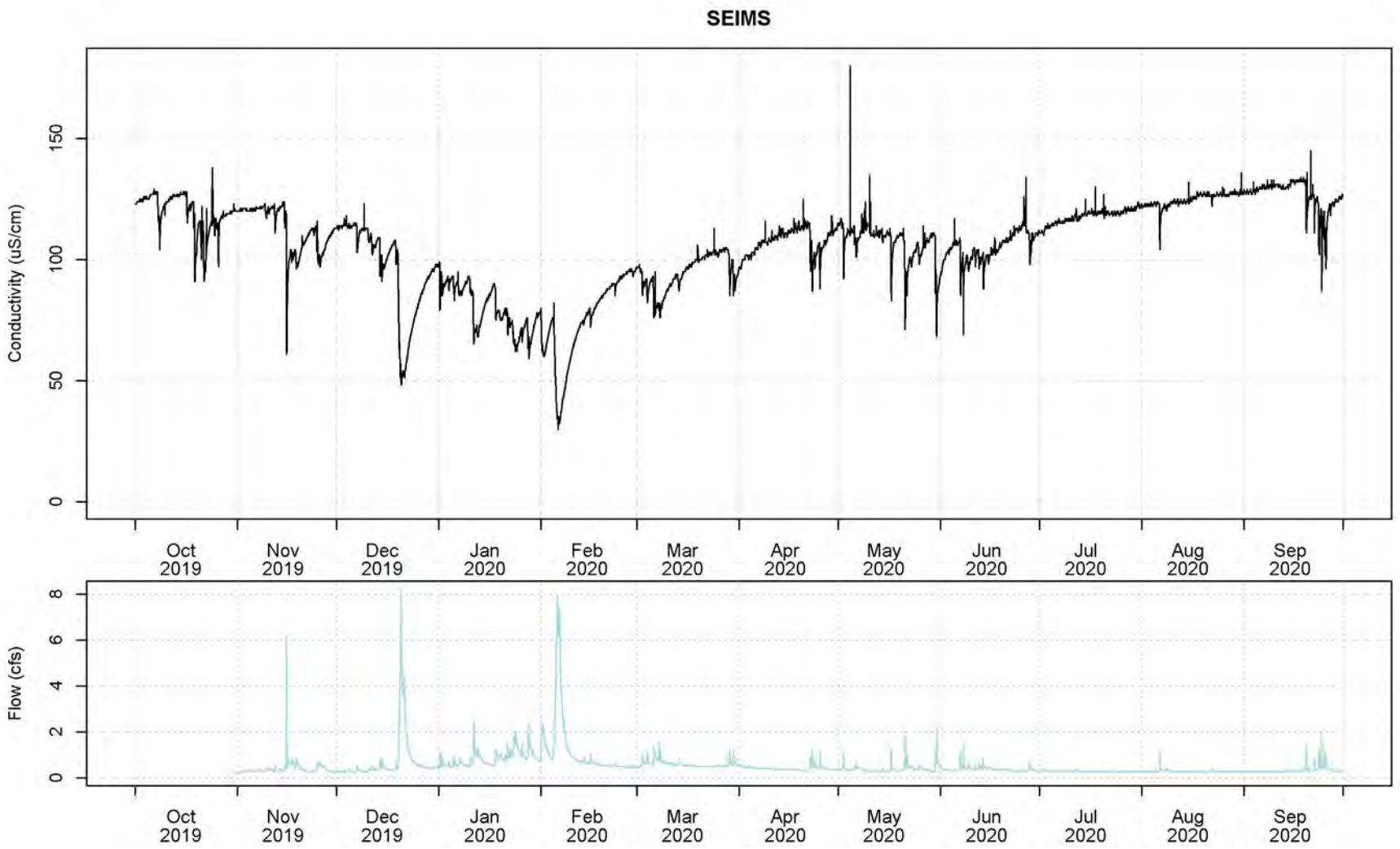


Figure K-7. Continuous Conductivity Measured at the SEIMS Station.

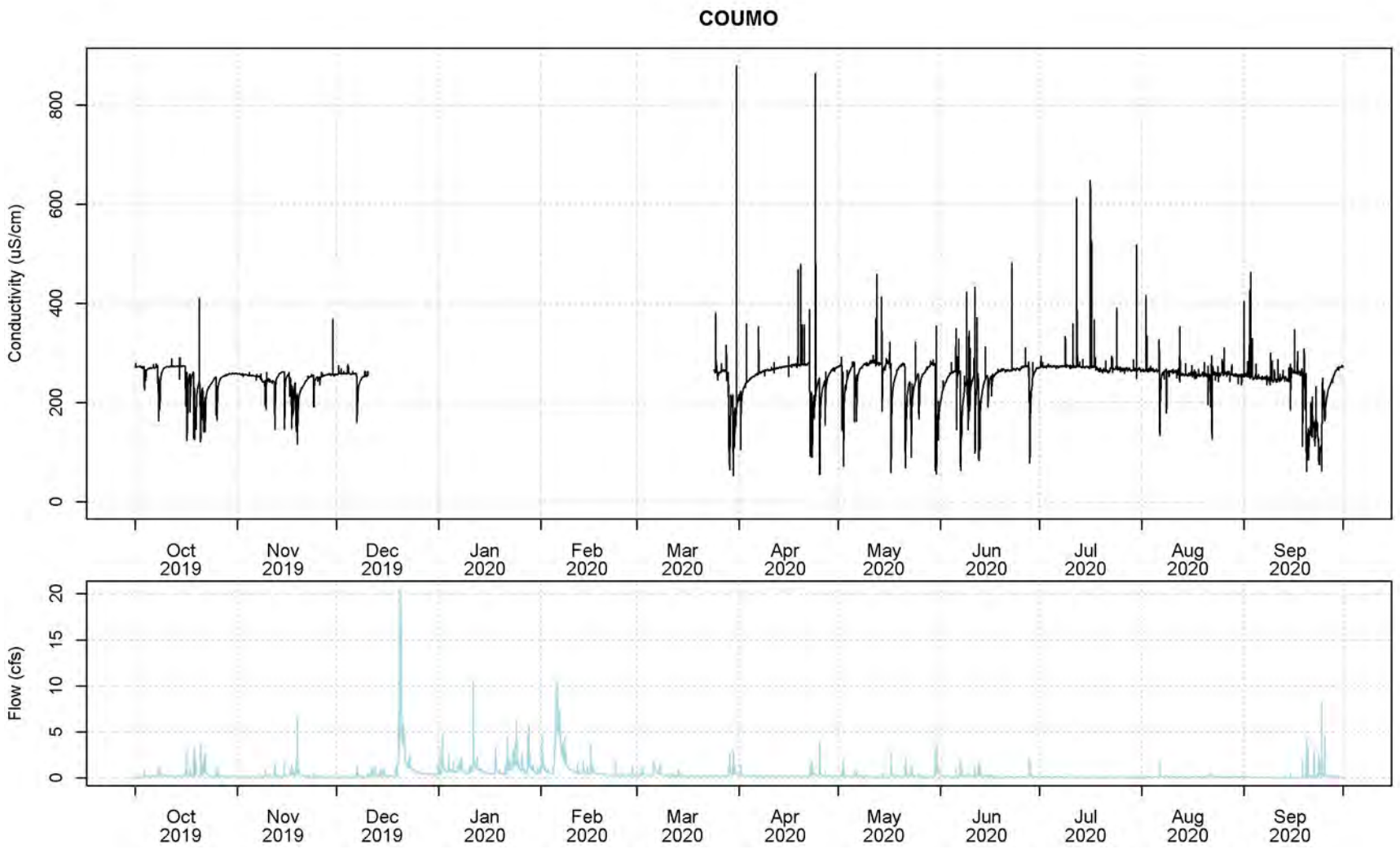


Figure K-8. Continuous Conductivity Measured at the COUMO Station.

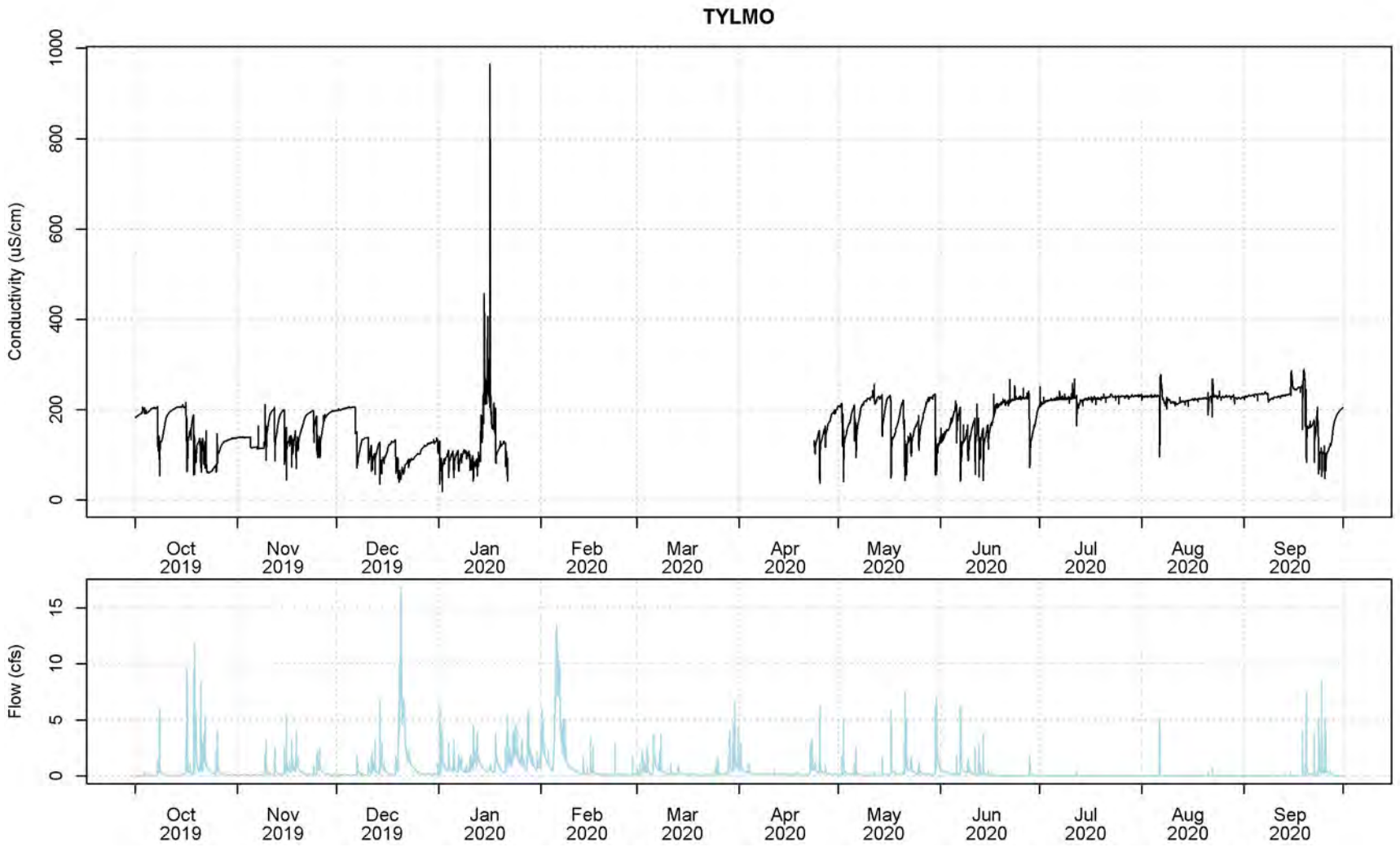


Figure K-9. Continuous Conductivity Measured at the TYLMO Station.

APPENDIX L

Compiled Field Data from Physical Habitat Monitoring

The contents of this appendix are provided in a separate electronic file.

APPENDIX M

Computed Physical Habitat Quality Indicators

The contents of this appendix are provided in a separate electronic file.

APPENDIX N

Summary Statistics for Evaluating Physical Habitat Quality Indicators

The contents of this appendix are provided in a separate electronic file.

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 23, 2020

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. 2007-065

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 7, 2020.

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 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
Project: 14-05806-000

Case Narrative

Samples were collected on July 7, 2020 and received by the laboratory on July 7, 2020. 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 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
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-IR-2020**					
Laboratory ID:	07-065-01					
Total Organic Carbon	**1.2**	0.11	EPA 9060A	7-22-20	7-22-20	

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0722S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	7-22-20	7-22-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-065-01								
	ORIG	DUP							
Total Organic Carbon	**1.20**	**1.20**	NA	NA	NA	NA	0	25	
SPIKE BLANK									
Laboratory ID:	SB0721S1								
	SB		SB		SB				
Total Organic Carbon	**41.6**		42.1	NA	99	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
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-IM-2020**					
Laboratory ID:	07-065-02					
Copper	**23**	2.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**270**	5.0	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
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-IR-2020**					
Laboratory ID:	07-065-01					
Naphthalene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.030	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**0.035**	0.030	EPA 8270E	7-17-20	7-17-20	
Anthracene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**0.062**	0.030	EPA 8270E	7-17-20	7-17-20	
Pyrene	**0.062**	0.030	EPA 8270E	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**0.031**	0.030	EPA 8270E	7-17-20	7-17-20	
Chrysene	**0.036**	0.030	EPA 8270E	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**0.047**	0.030	EPA 8270E	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**0.013**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**0.034**	0.030	EPA 8270E	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**0.023**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**0.023**	0.0060	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*62*	*22 - 109*				
Phenol-d6	*78*	*36 - 110*				
Nitrobenzene-d5	*68*	*31 - 109*				
2-Fluorobiphenyl	*72*	*45 - 107*				
2,4,6-Tribromophenol	*92*	*43 - 124*				
Terphenyl-d14	*90*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0717S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*50*	*22 - 109*				
Phenol-d6	*66*	*36 - 110*				
Nitrobenzene-d5	*62*	*31 - 109*				
2-Fluorobiphenyl	*69*	*45 - 107*				
2,4,6-Tribromophenol	*84*	*43 - 124*				
Terphenyl-d14	*90*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0717S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.775**	**0.964**	1.33	1.33	58	72	47 - 104	22	30	
2-Chlorophenol	**0.771**	**0.971**	1.33	1.33	58	73	45 - 108	23	31	
1,4-Dichlorobenzene	**0.343**	**0.461**	0.667	0.667	51	69	41 - 105	29	32	
n-Nitroso-di-n-propylamine	**0.419**	**0.502**	0.667	0.667	63	75	47 - 103	18	28	
1,2,4-Trichlorobenzene	**0.381**	**0.480**	0.667	0.667	57	72	42 - 111	23	32	
4-Chloro-3-methylphenol	**1.03**	**1.16**	1.33	1.33	77	87	61 - 108	12	25	
Acenaphthene	**0.408**	**0.490**	0.667	0.667	61	73	54 - 102	18	23	
4-Nitrophenol	**1.07**	**1.21**	1.33	1.33	80	91	53 - 122	12	24	
2,4-Dinitrotoluene	**0.453**	**0.528**	0.667	0.667	68	79	57 - 107	15	22	
Pentachlorophenol	**0.813**	**0.917**	1.33	1.33	61	69	44 - 132	12	23	
Pyrene	**0.523**	**0.573**	0.667	0.667	78	86	58 - 111	9	21	
Surrogate:										
2-Fluorophenol					*51*	*67*	*22 - 109*			
Phenol-d6					*65*	*82*	*36 - 110*			
Nitrobenzene-d5					*63*	*76*	*31 - 109*			
2-Fluorobiphenyl					*66*	*76*	*45 - 107*			
2,4,6-Tribromophenol					*82*	*92*	*43 - 124*			
Terphenyl-d14					*80*	*90*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-IR-2020**					
Laboratory ID:	07-065-01					
Total Solids	**67**	0.50	SM 2540G	7-17-20	7-20-20	
Client ID:	**TOSH-IM-2020**					
Laboratory ID:	07-065-02					
Total Solids	**50**	0.50	SM 2540G	9-18-20	9-21-20	

Date of Report: September 23, 2020
Samples Submitted: July 7, 2020
Laboratory Reference: 2007-065
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:	07-158-02								
	ORIG	DUP							
Total Solids	**65.6**	**73.8**	NA	NA	NA	NA	12	20	
Laboratory ID:	07-065-02								
	ORIG	DUP							
Total Solids	**49.8**	**49.6**	NA	NA	NA	NA	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

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: Hurvera
Project Number: 14-05806-000
Project Name: RPWS
Project Manager: John Lenth
Sampled by: Brianna Bland

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☐ Standard (7 Days)
☒ can hold for other samples (other)

Laboratory Number: 07-065

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	Metals (Cu, Zn) EPA 6020	TOC - EPA 9060A	PAHs - EPA 8270D/SIM	Phthalates - EPA 8270D	% Moisture
1	TOSH-1R-2020	7.7.20	1230	soil	1																			X	X	X	X
2	TOSH-1M-2020	7.7.20	1230	soil	1																		X					X

	Signature	Company	Date	Time
Relinquished	Brianna Bland	HEC	7.7.20	1600
Received		COSE	7/7/20	1600
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

2540G

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 23, 2020

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. 2007-089

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 9, 2020.

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 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
Project: 14-05806-000

Case Narrative

Samples were collected on July 8 and 9, 2020 and received by the laboratory on July 9, 2020. 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 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
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-2020**					
Laboratory ID:	07-089-02					
Total Organic Carbon	**0.91**	0.085	EPA 9060A	7-22-20	7-22-20	
Client ID:	**MONT-5R-2020**					
Laboratory ID:	07-089-04					
Total Organic Carbon	**4.7**	0.44	EPA 9060A	7-22-20	7-22-20	

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0722S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	7-22-20	7-22-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-065-01								
	ORIG	DUP							
Total Organic Carbon	**1.20**	**1.20**	NA	NA	NA	NA	0	25	
SPIKE BLANK									
Laboratory ID:	SB0721S1								
	SB		SB		SB				
Total Organic Carbon	**41.6**		42.1	NA	99	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
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-2020**					
Laboratory ID:	07-089-01					
Copper	**11**	4.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**65**	10	EPA 6010D	9-17-20	9-17-20	
Client ID:	**MONT-5M-2020**					
Laboratory ID:	07-089-03					
Copper	**27**	4.5	EPA 6010D	9-17-20	9-17-20	
Zinc	**280**	11	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**COLIN-1R-2020**					
Laboratory ID:	07-089-02					
Naphthalene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.029	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.14	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.14	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.14	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Chrysene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.14	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.14	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**ND**	0.0058	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*75*	*22 - 109*				
Phenol-d6	*88*	*36 - 110*				
Nitrobenzene-d5	*81*	*31 - 109*				
2-Fluorobiphenyl	*84*	*45 - 107*				
2,4,6-Tribromophenol	*100*	*43 - 124*				
Terphenyl-d14	*100*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-5R-2020**					
Laboratory ID:	07-089-04					
Naphthalene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.048	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.24	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.24	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.24	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Chrysene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.24	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.24	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**ND**	0.0097	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*65*	*22 - 109*				
Phenol-d6	*79*	*36 - 110*				
Nitrobenzene-d5	*71*	*31 - 109*				
2-Fluorobiphenyl	*60*	*45 - 107*				
2,4,6-Tribromophenol	*84*	*43 - 124*				
Terphenyl-d14	*74*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0717S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*50*	*22 - 109*				
Phenol-d6	*66*	*36 - 110*				
Nitrobenzene-d5	*62*	*31 - 109*				
2-Fluorobiphenyl	*69*	*45 - 107*				
2,4,6-Tribromophenol	*84*	*43 - 124*				
Terphenyl-d14	*90*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0717S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.775**	**0.964**	1.33	1.33	58	72	47 - 104	22	30	
2-Chlorophenol	**0.771**	**0.971**	1.33	1.33	58	73	45 - 108	23	31	
1,4-Dichlorobenzene	**0.343**	**0.461**	0.667	0.667	51	69	41 - 105	29	32	
n-Nitroso-di-n-propylamine	**0.419**	**0.502**	0.667	0.667	63	75	47 - 103	18	28	
1,2,4-Trichlorobenzene	**0.381**	**0.480**	0.667	0.667	57	72	42 - 111	23	32	
4-Chloro-3-methylphenol	**1.03**	**1.16**	1.33	1.33	77	87	61 - 108	12	25	
Acenaphthene	**0.408**	**0.490**	0.667	0.667	61	73	54 - 102	18	23	
4-Nitrophenol	**1.07**	**1.21**	1.33	1.33	80	91	53 - 122	12	24	
2,4-Dinitrotoluene	**0.453**	**0.528**	0.667	0.667	68	79	57 - 107	15	22	
Pentachlorophenol	**0.813**	**0.917**	1.33	1.33	61	69	44 - 132	12	23	
Pyrene	**0.523**	**0.573**	0.667	0.667	78	86	58 - 111	9	21	
Surrogate:										
2-Fluorophenol					*51*	*67*	*22 - 109*			
Phenol-d6					*65*	*82*	*36 - 110*			
Nitrobenzene-d5					*63*	*76*	*31 - 109*			
2-Fluorobiphenyl					*66*	*76*	*45 - 107*			
2,4,6-Tribromophenol					*82*	*92*	*43 - 124*			
Terphenyl-d14					*80*	*90*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
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-2020**					
Laboratory ID:	07-089-01					
Total Solids	**25**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**COLIN-1R-2020**					
Laboratory ID:	07-089-02					
Total Solids	**69**	0.50	SM 2540G	7-17-20	7-20-20	
Client ID:	**MONT-5M-2020**					
Laboratory ID:	07-089-03					
Total Solids	**22**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**MONT-5R-2020**					
Laboratory ID:	07-089-04					
Total Solids	**41**	0.50	SM 2540G	7-17-20	7-20-20	

Date of Report: September 23, 2020
Samples Submitted: July 9, 2020
Laboratory Reference: 2007-089
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:	07-158-02								
	ORIG	DUP							
Total Solids	**65.6**	**73.8**	NA	NA	NA	NA	12	20	
Laboratory ID:	07-065-02								
	ORIG	DUP							
Total Solids	**49.8**	**49.6**	NA	NA	NA	NA	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

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: Redmond Paired Watershed
Project Manager: John Lenth
Sampled by: N. Mads

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 07-089

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	TOC	Total Zinc	Total Copper	Phthalates	% Moisture / Total Solids 2045
1	COLIN-1M-2020	7/8/20	0945	SED	1																			X	X		X
2	COLIN-1R-2020	7/8/20	↓		1									X									X			X	
3	MONT-5M-2020	7/9/20	0930		1																			X	X		
4	MONT-5R-2020	7/9/20	↓	↓	1									X									X			X	

	Signature	Company	Date	Time
Relinquished		Herrera	1330	7/9/20
Received		OSE	7/9/20	1330
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 23, 2020

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. 2007-153

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 15, 2020.

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 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

Case Narrative

Samples were collected on July 15, 2020 and received by the laboratory on July 15, 2020. 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 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVALSS-R-2020**					
Laboratory ID:	07-153-01					
Total Organic Carbon	**4.7**	0.47	EPA 9060A	8-6-20	8-6-20	
Client ID:	**SIDL-2R-2020**					
Laboratory ID:	07-153-03					
Total Organic Carbon	**2.3**	0.084	EPA 9060A	8-6-20	8-6-20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0806S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-6-20	8-6-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-172-02								
	ORIG	DUP							
Total Organic Carbon	**3.51**	**3.63**	NA	NA	NA	NA	3	25	
SPIKE BLANK									
Laboratory ID:	SB0806S1								
	SB		SB		SB				
Total Organic Carbon	**40.7**		42.1	NA	97	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
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:	**EVALSS-M-2020**					
Laboratory ID:	07-153-02					
Copper	**36**	6.3	EPA 6010D	9-17-20	9-17-20	
Zinc	**130**	16	EPA 6010D	9-17-20	9-17-20	
Client ID:	**SIDL-2M-2020**					
Laboratory ID:	07-153-04					
Copper	**27**	3.2	EPA 6010D	9-17-20	9-17-20	
Zinc	**62**	8.1	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVALSS-R-2020**					
Laboratory ID:	07-153-01					
Naphthalene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.055	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.055	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.055	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**0.042**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**0.077**	0.055	EPA 8270E	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.055	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**0.061**	0.055	EPA 8270E	7-17-20	7-17-20	
Chrysene	**0.063**	0.055	EPA 8270E	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.055	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.055	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**0.088**	0.055	EPA 8270E	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**0.026**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**0.064**	0.055	EPA 8270E	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**0.030**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**0.025**	0.011	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*65*	*22 - 109*				
Phenol-d6	*79*	*36 - 110*				
Nitrobenzene-d5	*72*	*31 - 109*				
2-Fluorobiphenyl	*75*	*45 - 107*				
2,4,6-Tribromophenol	*87*	*43 - 124*				
Terphenyl-d14	*85*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-2R-2020**					
Laboratory ID:	07-153-03					
Naphthalene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.038	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.038	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.038	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.038	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Chrysene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.038	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.038	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**ND**	0.0075	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*60*	*22 - 109*				
Phenol-d6	*78*	*36 - 110*				
Nitrobenzene-d5	*68*	*31 - 109*				
2-Fluorobiphenyl	*67*	*45 - 107*				
2,4,6-Tribromophenol	*84*	*43 - 124*				
Terphenyl-d14	*78*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0717S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*50*	*22 - 109*				
Phenol-d6	*66*	*36 - 110*				
Nitrobenzene-d5	*62*	*31 - 109*				
2-Fluorobiphenyl	*69*	*45 - 107*				
2,4,6-Tribromophenol	*84*	*43 - 124*				
Terphenyl-d14	*90*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0717S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.775**	**0.964**	1.33	1.33	58	72	47 - 104	22	30	
2-Chlorophenol	**0.771**	**0.971**	1.33	1.33	58	73	45 - 108	23	31	
1,4-Dichlorobenzene	**0.343**	**0.461**	0.667	0.667	51	69	41 - 105	29	32	
n-Nitroso-di-n-propylamine	**0.419**	**0.502**	0.667	0.667	63	75	47 - 103	18	28	
1,2,4-Trichlorobenzene	**0.381**	**0.480**	0.667	0.667	57	72	42 - 111	23	32	
4-Chloro-3-methylphenol	**1.03**	**1.16**	1.33	1.33	77	87	61 - 108	12	25	
Acenaphthene	**0.408**	**0.490**	0.667	0.667	61	73	54 - 102	18	23	
4-Nitrophenol	**1.07**	**1.21**	1.33	1.33	80	91	53 - 122	12	24	
2,4-Dinitrotoluene	**0.453**	**0.528**	0.667	0.667	68	79	57 - 107	15	22	
Pentachlorophenol	**0.813**	**0.917**	1.33	1.33	61	69	44 - 132	12	23	
Pyrene	**0.523**	**0.573**	0.667	0.667	78	86	58 - 111	9	21	
Surrogate:										
2-Fluorophenol					*51*	*67*	*22 - 109*			
Phenol-d6					*65*	*82*	*36 - 110*			
Nitrobenzene-d5					*63*	*76*	*31 - 109*			
2-Fluorobiphenyl					*66*	*76*	*45 - 107*			
2,4,6-Tribromophenol					*82*	*92*	*43 - 124*			
Terphenyl-d14					*80*	*90*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVALSS-R-2020**					
Laboratory ID:	07-153-01					
Total Solids	**37**	0.50	SM 2540G	7-17-20	7-20-20	
Client ID:	**EVALSS-M-2020**					
Laboratory ID:	07-153-02					
Total Solids	**16**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**SIDL-2R-2020**					
Laboratory ID:	07-153-03					
Total Solids	**53**	0.50	SM 2540G	7-17-20	7-20-20	
Client ID:	**SIDL-2M-2020**					
Laboratory ID:	07-153-04					
Total Solids	**31**	0.50	SM 2540G	9-18-20	9-21-20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-153
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:	07-158-02								
	ORIG	DUP							
Total Solids	**65.6**	**73.8**	NA	NA	NA	NA	12	20	
Laboratory ID:	07-065-02								
	ORIG	DUP							
Total Solids	**49.8**	**49.6**	NA	NA	NA	NA	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

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. 07-153

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates						Total Solids 2015 & 25406
1	EVALSS-R-2020	7/15/20	1100	Sediment	1	X			X	X						X
2	EVALSS-M-2020	7/15/20	1100	Sediment	1		X	X								
3	SIDL-2R-2020	7/13/20	0915	Sediment	1	X			X	X						
4	SIDL-2M-2020	7/13/20	0915	Sediment	1		X	X								
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											
				Sediment	1											

Relinquished by [signature] Date 7/15/20 Received by [signature] Date 7/15/20
Firm Herrera Time 1515 Firm OSE Time 1515

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 23, 2020

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. 2007-158

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 15, 2020.

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 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
Project: 14-05806-000

Case Narrative

Samples were collected on July 15, 2020 and received by the laboratory on July 15, 2020. 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 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
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-2R-2020**					
Laboratory ID:	07-158-02					
Total Organic Carbon	**0.78**	0.072	EPA 9060A	7-22-20	7-22-20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0722S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	7-22-20	7-22-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-065-01								
	ORIG	DUP							
Total Organic Carbon	**1.20**	**1.20**	NA	NA	NA	NA	0	25	
SPIKE BLANK									
Laboratory ID:	SB0721S1								
	SB		SB		SB				
Total Organic Carbon	**41.6**		42.1	NA	99	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
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-2M-2020**					
Laboratory ID:	07-158-01					
Copper	**22**	1.7	EPA 6010D	9-17-20	9-17-20	
Zinc	**270**	4.2	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-2R-2020**					
Laboratory ID:	07-158-02					
Naphthalene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.031	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**0.049**	0.031	EPA 8270E	7-17-20	7-17-20	
Anthracene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**0.080**	0.031	EPA 8270E	7-17-20	7-17-20	
Pyrene	**0.075**	0.031	EPA 8270E	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**0.034**	0.031	EPA 8270E	7-17-20	7-17-20	
Chrysene	**0.040**	0.031	EPA 8270E	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.15	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**0.051**	0.031	EPA 8270E	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**0.017**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**0.038**	0.031	EPA 8270E	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**0.026**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**0.024**	0.0061	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*62*	*22 - 109*				
Phenol-d6	*79*	*36 - 110*				
Nitrobenzene-d5	*70*	*31 - 109*				
2-Fluorobiphenyl	*74*	*45 - 107*				
2,4,6-Tribromophenol	*85*	*43 - 124*				
Terphenyl-d14	*90*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0717S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	7-17-20	7-17-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	7-17-20	7-17-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	7-17-20	7-17-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*50*	*22 - 109*				
Phenol-d6	*66*	*36 - 110*				
Nitrobenzene-d5	*62*	*31 - 109*				
2-Fluorobiphenyl	*69*	*45 - 107*				
2,4,6-Tribromophenol	*84*	*43 - 124*				
Terphenyl-d14	*90*	*52 - 118*				

Date of Report: September 23, 2020
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Laboratory Reference: 2007-158
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0717S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.775**	**0.964**	1.33	1.33	58	72	47 - 104	22	30	
2-Chlorophenol	**0.771**	**0.971**	1.33	1.33	58	73	45 - 108	23	31	
1,4-Dichlorobenzene	**0.343**	**0.461**	0.667	0.667	51	69	41 - 105	29	32	
n-Nitroso-di-n-propylamine	**0.419**	**0.502**	0.667	0.667	63	75	47 - 103	18	28	
1,2,4-Trichlorobenzene	**0.381**	**0.480**	0.667	0.667	57	72	42 - 111	23	32	
4-Chloro-3-methylphenol	**1.03**	**1.16**	1.33	1.33	77	87	61 - 108	12	25	
Acenaphthene	**0.408**	**0.490**	0.667	0.667	61	73	54 - 102	18	23	
4-Nitrophenol	**1.07**	**1.21**	1.33	1.33	80	91	53 - 122	12	24	
2,4-Dinitrotoluene	**0.453**	**0.528**	0.667	0.667	68	79	57 - 107	15	22	
Pentachlorophenol	**0.813**	**0.917**	1.33	1.33	61	69	44 - 132	12	23	
Pyrene	**0.523**	**0.573**	0.667	0.667	78	86	58 - 111	9	21	
Surrogate:										
2-Fluorophenol					*51*	*67*	*22 - 109*			
Phenol-d6					*65*	*82*	*36 - 110*			
Nitrobenzene-d5					*63*	*76*	*31 - 109*			
2-Fluorobiphenyl					*66*	*76*	*45 - 107*			
2,4,6-Tribromophenol					*82*	*92*	*43 - 124*			
Terphenyl-d14					*80*	*90*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-2M-2020**					
Laboratory ID:	07-158-01					
Total Solids	**59**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**TOSH-2R-2020**					
Laboratory ID:	07-158-02					
Total Solids	**66**	0.50	SM 2540G	7-17-20	7-20-20	

Date of Report: September 23, 2020
Samples Submitted: July 15, 2020
Laboratory Reference: 2007-158
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:	07-158-02								
	ORIG	DUP							
Total Solids	**65.6**	**73.8**	NA	NA	NA	NA	12	20	
Laboratory ID:	07-065-02								
	ORIG	DUP							
Total Solids	**49.8**	**49.6**	NA	NA	NA	NA	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

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: Herrera
Project Number: 14-05806-000
Project Name: BPWS
Project Manager: J. Leith
Sampled by: K. Bliss

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days)
- ☐ _____ (other)

Laboratory Number: 07-158

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	~~dissolved~~ metals (Cu, Zn)	Phthalates	PAHs	DOC, TOC	** Moisture TOTAL SOLIDS 2540 G
1	TOSH-ZM-2020	7.15.20	12:00	Sed.	1																		X				X
2	TOSH-ZR-2020	7.15.20	12:00	Sed.	1																			X	X	X	X

	Signature	Company	Date	Time
Relinquished		Herrera	07/15/20	17:35
Received		COSE	7/15/20	1735
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 23, 2020

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. 2007-172

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 17, 2020.

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 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
Project: 14-05806-000

Case Narrative

Samples were collected on July 17, 2020 and received by the laboratory on July 17, 2020. 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 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
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-2R-2020**					
Laboratory ID:	07-172-02					
Total Organic Carbon	**3.5**	0.11	EPA 9060A	8-6-20	8-6-20	

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0806S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-6-20	8-6-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-172-02								
	ORIG	DUP							
Total Organic Carbon	**3.51**	**3.63**	NA	NA	NA	NA	3	25	
SPIKE BLANK									
Laboratory ID:	SB0806S1								
	SB		SB		SB				
Total Organic Carbon	**40.7**		42.1	NA	97	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
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-2M-2020**					
Laboratory ID:	07-172-01					
Copper	**19**	2.2	EPA 6010D	9-17-20	9-17-20	
Zinc	**72**	5.4	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY-2R-2020**					
Laboratory ID:	07-172-02					
Naphthalene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
2-Methylnaphthalene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
1-Methylnaphthalene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Dimethylphthalate	**ND**	0.038	EPA 8270E	7-30-20	7-31-20	
Acenaphthylene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Acenaphthene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Diethylphthalate	**ND**	0.038	EPA 8270E	7-30-20	7-31-20	
Fluorene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Phenanthrene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Anthracene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Di-n-butylphthalate	**ND**	0.038	EPA 8270E	7-30-20	7-31-20	
Fluoranthene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Pyrene	**0.0082**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Butylbenzylphthalate	**ND**	0.038	EPA 8270E	7-30-20	7-31-20	
Benzo[a]anthracene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Chrysene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.15	EPA 8270E	7-30-20	7-31-20	
Di-n-octylphthalate	**ND**	0.038	EPA 8270E	7-30-20	7-31-20	
Benzo[b]fluoranthene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo(j,k)fluoranthene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[a]pyrene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Dibenz[a,h]anthracene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[g,h,i]perylene	**ND**	0.0076	EPA 8270E/SIM	7-30-20	7-31-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*61*	*22 - 109*				
Phenol-d6	*75*	*36 - 110*				
Nitrobenzene-d5	*67*	*31 - 109*				
2-Fluorobiphenyl	*77*	*45 - 107*				
2,4,6-Tribromophenol	*95*	*43 - 124*				
Terphenyl-d14	*82*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0730S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Diethylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Di-n-butylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Butylbenzylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.080	EPA 8270E	7-30-20	7-31-20	
Di-n-octylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*73*	*22 - 109*				
Phenol-d6	*83*	*36 - 110*				
Nitrobenzene-d5	*79*	*31 - 109*				
2-Fluorobiphenyl	*90*	*45 - 107*				
2,4,6-Tribromophenol	*111*	*43 - 124*				
Terphenyl-d14	*100*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0730S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.632**	**0.661**	0.800	0.800	79	83	47 - 104	4	30	
2-Chlorophenol	**0.616**	**0.651**	0.800	0.800	77	81	45 - 108	6	31	
1,4-Dichlorobenzene	**0.286**	**0.302**	0.400	0.400	72	76	41 - 105	5	32	
n-Nitroso-di-n-propylamine	**0.308**	**0.333**	0.400	0.400	77	83	47 - 103	8	28	
1,2,4-Trichlorobenzene	**0.311**	**0.332**	0.400	0.400	78	83	42 - 111	7	32	
4-Chloro-3-methylphenol	**0.749**	**0.770**	0.800	0.800	94	96	61 - 108	3	25	
Acenaphthene	**0.330**	**0.352**	0.400	0.400	83	88	54 - 102	6	23	
4-Nitrophenol	**0.771**	**0.758**	0.800	0.800	96	95	53 - 122	2	24	
2,4-Dinitrotoluene	**0.380**	**0.383**	0.400	0.400	95	96	57 - 107	1	22	
Pentachlorophenol	**0.849**	**0.871**	0.800	0.800	106	109	44 - 132	3	23	
Pyrene	**0.382**	**0.403**	0.400	0.400	96	101	58 - 111	5	21	
Surrogate:										
2-Fluorophenol					*67*	*69*	*22 - 109*			
Phenol-d6					*81*	*82*	*36 - 110*			
Nitrobenzene-d5					*75*	*76*	*31 - 109*			
2-Fluorobiphenyl					*83*	*87*	*45 - 107*			
2,4,6-Tribromophenol					*102*	*106*	*43 - 124*			
Terphenyl-d14					*90*	*95*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY-2M-2020**					
Laboratory ID:	07-172-01					
Total Solids	**46**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**CTRY-2R-2020**					
Laboratory ID:	07-172-02					
Total Solids	**52**	0.50	SM 2540G	7-30-20	7-31-20	

Date of Report: September 23, 2020
Samples Submitted: July 17, 2020
Laboratory Reference: 2007-172
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:	07-231-02								
	ORIG	DUP							
Total Solids	**62.7**	**64.4**	NA	NA	NA	NA	3	20	
Laboratory ID:	07-065-02								
	ORIG	DUP							
Total Solids	**49.8**	**49.6**	NA	NA	NA	NA	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

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

CHAIN OF CUSTODY

07-172

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.

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates							TOTAL SOLIDS 25406
1	CTRY-2M-2020	7.17.20	1030	Sediment	1		X	X									←D
2	CTRY-2R-2020	7.17.20	1030	Sediment	1	X			X	X							
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by [signature] Date 7.17.20 Received by [signature] Date 7/17/20

Firm HEC Time 1320 Firm OSE Time 1320

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 23, 2020

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. 2007-231

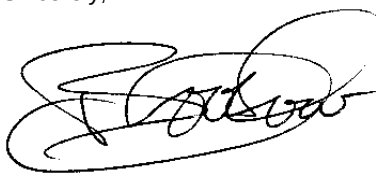
Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 23, 2020.

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 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

Case Narrative

Samples were collected on July 22 and 23, 2020 and received by the laboratory on July 23, 2020. 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 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
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-1R-2020**					
Laboratory ID:	07-231-02					
Total Organic Carbon	**2.1**	0.075	EPA 9060A	8-13-20	8-13-20	
Client ID:	**MONT-4R-2020**					
Laboratory ID:	07-231-04					
Total Organic Carbon	**3.7**	0.22	EPA 9060A	8-13-20	8-13-20	

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0813S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-13-20	8-13-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-231-02								
	ORIG	DUP							
Total Organic Carbon	**2.06**	**2.02**	NA	NA	NA	NA	2	25	
SPIKE BLANK									
Laboratory ID:	SB0813S1								
	SB		SB		SB				
Total Organic Carbon	**39.7**		42.1	NA	94	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
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-1M-2020**					
Laboratory ID:	07-231-01					
Copper	**51**	3.2	EPA 6010D	9-17-20	9-17-20	
Zinc	**450**	8.0	EPA 6010D	9-17-20	9-17-20	
Client ID:	**MONT-4M-2020**					
Laboratory ID:	07-231-03					
Copper	**37**	3.4	EPA 6010D	9-17-20	9-17-20	
Zinc	**140**	8.6	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-1R-2020**					
Laboratory ID:	07-231-02					
Naphthalene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
2-Methylnaphthalene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
1-Methylnaphthalene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Dimethylphthalate	**ND**	0.032	EPA 8270E	7-30-20	8-1-20	
Acenaphthylene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Acenaphthene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Diethylphthalate	**ND**	0.032	EPA 8270E	7-30-20	8-1-20	
Fluorene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Phenanthrene	**0.0064**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Anthracene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Di-n-butylphthalate	**ND**	0.032	EPA 8270E	7-30-20	8-1-20	
Fluoranthene	**0.022**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Pyrene	**0.024**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Butylbenzylphthalate	**ND**	0.032	EPA 8270E	7-30-20	8-1-20	
Benzo[a]anthracene	**0.016**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Chrysene	**0.017**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.13	EPA 8270E	7-30-20	8-1-20	
Di-n-octylphthalate	**ND**	0.032	EPA 8270E	7-30-20	8-1-20	
Benzo[b]fluoranthene	**0.022**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo(j,k)fluoranthene	**0.0084**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[a]pyrene	**0.021**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Indeno[1,2,3-cd]pyrene	**0.014**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Dibenz[a,h]anthracene	**ND**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[g,h,i]perylene	**0.015**	0.0064	EPA 8270E/SIM	7-30-20	7-31-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*60*	*22 - 109*				
Phenol-d6	*74*	*36 - 110*				
Nitrobenzene-d5	*68*	*31 - 109*				
2-Fluorobiphenyl	*75*	*45 - 107*				
2,4,6-Tribromophenol	*85*	*43 - 124*				
Terphenyl-d14	*75*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-4R-2020**					
Laboratory ID:	07-231-04					
Naphthalene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
2-Methylnaphthalene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
1-Methylnaphthalene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Dimethylphthalate	**ND**	0.055	EPA 8270E	7-30-20	8-1-20	
Acenaphthylene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Acenaphthene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Diethylphthalate	**ND**	0.055	EPA 8270E	7-30-20	8-1-20	
Fluorene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Phenanthrene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Anthracene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Di-n-butylphthalate	**ND**	0.055	EPA 8270E	7-30-20	8-1-20	
Fluoranthene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Pyrene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Butylbenzylphthalate	**ND**	0.055	EPA 8270E	7-30-20	8-1-20	
Benzo[a]anthracene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Chrysene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.22	EPA 8270E	7-30-20	8-1-20	
Di-n-octylphthalate	**ND**	0.055	EPA 8270E	7-30-20	8-1-20	
Benzo[b]fluoranthene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo(j,k)fluoranthene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[a]pyrene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Dibenz[a,h]anthracene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[g,h,i]perylene	**ND**	0.011	EPA 8270E/SIM	7-30-20	7-31-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*38*	*22 - 109*				
Phenol-d6	*56*	*36 - 110*				
Nitrobenzene-d5	*41*	*31 - 109*				
2-Fluorobiphenyl	*61*	*45 - 107*				
2,4,6-Tribromophenol	*98*	*43 - 124*				
Terphenyl-d14	*85*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0730S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Diethylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Di-n-butylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Butylbenzylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.080	EPA 8270E	7-30-20	7-31-20	
Di-n-octylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*73*	*22 - 109*				
Phenol-d6	*83*	*36 - 110*				
Nitrobenzene-d5	*79*	*31 - 109*				
2-Fluorobiphenyl	*90*	*45 - 107*				
2,4,6-Tribromophenol	*111*	*43 - 124*				
Terphenyl-d14	*100*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0730S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.632**	**0.661**	0.800	0.800	79	83	47 - 104	4	30	
2-Chlorophenol	**0.616**	**0.651**	0.800	0.800	77	81	45 - 108	6	31	
1,4-Dichlorobenzene	**0.286**	**0.302**	0.400	0.400	72	76	41 - 105	5	32	
n-Nitroso-di-n-propylamine	**0.308**	**0.333**	0.400	0.400	77	83	47 - 103	8	28	
1,2,4-Trichlorobenzene	**0.311**	**0.332**	0.400	0.400	78	83	42 - 111	7	32	
4-Chloro-3-methylphenol	**0.749**	**0.770**	0.800	0.800	94	96	61 - 108	3	25	
Acenaphthene	**0.330**	**0.352**	0.400	0.400	83	88	54 - 102	6	23	
4-Nitrophenol	**0.771**	**0.758**	0.800	0.800	96	95	53 - 122	2	24	
2,4-Dinitrotoluene	**0.380**	**0.383**	0.400	0.400	95	96	57 - 107	1	22	
Pentachlorophenol	**0.849**	**0.871**	0.800	0.800	106	109	44 - 132	3	23	
Pyrene	**0.382**	**0.403**	0.400	0.400	96	101	58 - 111	5	21	
Surrogate:										
2-Fluorophenol					*67*	*69*	*22 - 109*			
Phenol-d6					*81*	*82*	*36 - 110*			
Nitrobenzene-d5					*75*	*76*	*31 - 109*			
2-Fluorobiphenyl					*83*	*87*	*45 - 107*			
2,4,6-Tribromophenol					*102*	*106*	*43 - 124*			
Terphenyl-d14					*90*	*95*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-1M-2020**					
Laboratory ID:	07-231-01					
Total Solids	**31**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**TYLR-1R-2020**					
Laboratory ID:	07-231-02					
Total Solids	**63**	0.50	SM 2540G	7-30-20	7-31-20	
Client ID:	**MONT-4M-2020**					
Laboratory ID:	07-231-03					
Total Solids	**29**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**MONT-4R-2020**					
Laboratory ID:	07-231-04					
Total Solids	**37**	0.50	SM 2540G	7-30-20	7-31-20	

Date of Report: September 23, 2020
Samples Submitted: July 23, 2020
Laboratory Reference: 2007-231
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:	07-231-02								
	ORIG	DUP							
Total Solids	**62.7**	**64.4**	NA	NA	NA	NA	3	20	
Laboratory ID:	07-065-02								
	ORIG	DUP							
Total Solids	**49.8**	**49.6**	NA	NA	NA	NA	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

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. 07-231

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates	Total Solids 2540 G						
1	TYLR-1M-2020	7/23/20	1000	Sediment	1	X	X	X	X		X						
2	TYLR-1R-2020	7/23/20	1000	Sediment	1	X			X	X	X						
3	MONT-4M-2020	7/22/20	0930	Sediment	1		X	X			X						
4	MONT-4R-2020	7/22/20	0930	Sediment	1	X			X	X	X						
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by _____ Date 7/23/20 Received by _____ Date 7/23/20
Firm Herrera Time 1230 Firm _____ Time 1230

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 23, 2020

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. 2007-298

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 29, 2020.

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 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

Case Narrative

Samples were collected on July 29, 2020 and received by the laboratory on July 29, 2020. 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 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-1R-2020**					
Laboratory ID:	07-298-02					
Total Organic Carbon	**4.4**	0.38	EPA 9060A	8-13-20	8-13-20	

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0813S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-13-20	8-13-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-231-02								
	ORIG	DUP							
Total Organic Carbon	**2.06**	**2.02**	NA	NA	NA	NA	2	25	
SPIKE BLANK									
Laboratory ID:	SB0813S1								
	SB		SB		SB				
Total Organic Carbon	**39.7**		42.1	NA	94	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
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:	**SIDL-1M-2020**					
Laboratory ID:	07-298-01					
Copper	**23**	6.7	EPA 6010D	9-17-20	9-17-20	
Zinc	**79**	17	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-1R-2020**					
Laboratory ID:	07-298-02					
Naphthalene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
2-Methylnaphthalene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
1-Methylnaphthalene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Dimethylphthalate	**ND**	0.059	EPA 8270E	7-30-20	8-1-20	
Acenaphthylene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Acenaphthene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Diethylphthalate	**ND**	0.059	EPA 8270E	7-30-20	8-1-20	
Fluorene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Phenanthrene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Anthracene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Di-n-butylphthalate	**ND**	0.059	EPA 8270E	7-30-20	8-1-20	
Fluoranthene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Pyrene	**0.017**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Butylbenzylphthalate	**ND**	0.059	EPA 8270E	7-30-20	8-1-20	
Benzo[a]anthracene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Chrysene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.24	EPA 8270E	7-30-20	8-1-20	
Di-n-octylphthalate	**ND**	0.059	EPA 8270E	7-30-20	8-1-20	
Benzo[b]fluoranthene	**0.017**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo(j,k)fluoranthene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[a]pyrene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Dibenz[a,h]anthracene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[g,h,i]perylene	**ND**	0.012	EPA 8270E/SIM	7-30-20	7-31-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*55*	*22 - 109*				
Phenol-d6	*70*	*36 - 110*				
Nitrobenzene-d5	*58*	*31 - 109*				
2-Fluorobiphenyl	*65*	*45 - 107*				
2,4,6-Tribromophenol	*93*	*43 - 124*				
Terphenyl-d14	*84*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0730S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Diethylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Di-n-butylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Butylbenzylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.080	EPA 8270E	7-30-20	7-31-20	
Di-n-octylphthalate	**ND**	0.020	EPA 8270E	7-30-20	7-31-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	7-30-20	7-31-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*73*	*22 - 109*				
Phenol-d6	*83*	*36 - 110*				
Nitrobenzene-d5	*79*	*31 - 109*				
2-Fluorobiphenyl	*90*	*45 - 107*				
2,4,6-Tribromophenol	*111*	*43 - 124*				
Terphenyl-d14	*100*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0730S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.632**	**0.661**	0.800	0.800	79	83	47 - 104	4	30	
2-Chlorophenol	**0.616**	**0.651**	0.800	0.800	77	81	45 - 108	6	31	
1,4-Dichlorobenzene	**0.286**	**0.302**	0.400	0.400	72	76	41 - 105	5	32	
n-Nitroso-di-n-propylamine	**0.308**	**0.333**	0.400	0.400	77	83	47 - 103	8	28	
1,2,4-Trichlorobenzene	**0.311**	**0.332**	0.400	0.400	78	83	42 - 111	7	32	
4-Chloro-3-methylphenol	**0.749**	**0.770**	0.800	0.800	94	96	61 - 108	3	25	
Acenaphthene	**0.330**	**0.352**	0.400	0.400	83	88	54 - 102	6	23	
4-Nitrophenol	**0.771**	**0.758**	0.800	0.800	96	95	53 - 122	2	24	
2,4-Dinitrotoluene	**0.380**	**0.383**	0.400	0.400	95	96	57 - 107	1	22	
Pentachlorophenol	**0.849**	**0.871**	0.800	0.800	106	109	44 - 132	3	23	
Pyrene	**0.382**	**0.403**	0.400	0.400	96	101	58 - 111	5	21	
Surrogate:										
2-Fluorophenol					*67*	*69*	*22 - 109*			
Phenol-d6					*81*	*82*	*36 - 110*			
Nitrobenzene-d5					*75*	*76*	*31 - 109*			
2-Fluorobiphenyl					*83*	*87*	*45 - 107*			
2,4,6-Tribromophenol					*102*	*106*	*43 - 124*			
Terphenyl-d14					*90*	*95*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-1M-2020**					
Laboratory ID:	07-298-01					
Total Solids	**15**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**SIDL-1R-2020**					
Laboratory ID:	07-298-02					
Total Solids	**34**	0.50	SM 2540G	7-30-20	7-31-20	

Date of Report: September 23, 2020
Samples Submitted: July 29, 2020
Laboratory Reference: 2007-298
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:	07-231-02								
	ORIG	DUP							
Total Solids	**62.7**	**64.4**	NA	NA	NA	NA	3	20	
Laboratory ID:	07-065-02								
	ORIG	DUP							
Total Solids	**49.8**	**49.6**	NA	NA	NA	NA	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

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: John Lenth

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

Laboratory No. 07-298

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates					Total Solids 2540 G		
1	SIDL-1M-2020	7/29/20	1000	Sediment	1		X	X							X		
2	SIDL-1R-2020	7/29/20	1000	Sediment	1	X			X	X					X		
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by [signature] Date 7/29/20 Received by Matthew Lead Date 7/29/20
Firm Herrera Time 1320 Firm OSE Time 1320
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 23, 2020

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. 2008-010

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 3, 2020.

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 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

Case Narrative

Samples were collected on August 3, 2020 and received by the laboratory on August 3, 2020. 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 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS-1R-2020**					
Laboratory ID:	08-010-02					
Total Organic Carbon	**8.8**	0.32	EPA 9060A	8-13-20	8-13-20	

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0813S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-13-20	8-13-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	07-231-02								
	ORIG	DUP							
Total Organic Carbon	**2.06**	**2.02**	NA	NA	NA	NA	2	25	
SPIKE BLANK									
Laboratory ID:	SB0813S1								
	SB		SB		SB				
Total Organic Carbon	**39.7**		42.1	NA	94	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
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:	**EVAMS-1M-2020**					
Laboratory ID:	08-010-01					
Copper	**20**	5.7	EPA 6010D	9-17-20	9-17-20	
Zinc	**110**	14	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS-1R-2020**					
Laboratory ID:	08-010-02					
Naphthalene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
2-Methylnaphthalene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
1-Methylnaphthalene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Dimethylphthalate	**ND**	0.066	EPA 8270E	8-12-20	8-14-20	
Acenaphthylene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Acenaphthene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Diethylphthalate	**ND**	0.13	EPA 8270E	8-12-20	8-14-20	
Fluorene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Phenanthrene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Anthracene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Di-n-butylphthalate	**ND**	0.13	EPA 8270E	8-12-20	8-14-20	
Fluoranthene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Pyrene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Butylbenzylphthalate	**ND**	0.13	EPA 8270E	8-12-20	8-14-20	
Benzo[a]anthracene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Chrysene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.13	EPA 8270E	8-12-20	8-14-20	
Di-n-octylphthalate	**ND**	0.13	EPA 8270E	8-12-20	8-14-20	
Benzo[b]fluoranthene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo(j,k)fluoranthene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[a]pyrene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Dibenz[a,h]anthracene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[g,h,i]perylene	**ND**	0.013	EPA 8270E/SIM	8-12-20	8-15-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*45*	*22 - 109*				
Phenol-d6	*96*	*36 - 110*				
Nitrobenzene-d5	*89*	*31 - 109*				
2-Fluorobiphenyl	*92*	*45 - 107*				
2,4,6-Tribromophenol	*108*	*43 - 124*				
Terphenyl-d14	*94*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	8-12-20	8-13-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*62*	*22 - 109*				
Phenol-d6	*79*	*36 - 110*				
Nitrobenzene-d5	*54*	*31 - 109*				
2-Fluorobiphenyl	*83*	*45 - 107*				
2,4,6-Tribromophenol	*89*	*43 - 124*				
Terphenyl-d14	*83*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0812S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.557**	**0.662**	0.800	0.800	70	83	47 - 104	17	30	
2-Chlorophenol	**0.549**	**0.649**	0.800	0.800	69	81	45 - 108	17	31	
1,4-Dichlorobenzene	**0.278**	**0.300**	0.400	0.400	70	75	41 - 105	8	32	
n-Nitroso-di-n-propylamine	**0.304**	**0.331**	0.400	0.400	76	83	47 - 103	9	28	
1,2,4-Trichlorobenzene	**0.333**	**0.346**	0.400	0.400	83	87	42 - 111	4	32	
4-Chloro-3-methylphenol	**0.728**	**0.730**	0.800	0.800	91	91	61 - 108	0	25	
Acenaphthene	**0.335**	**0.346**	0.400	0.400	84	87	54 - 102	3	23	
4-Nitrophenol	**0.685**	**0.669**	0.800	0.800	86	84	53 - 122	2	24	
2,4-Dinitrotoluene	**0.325**	**0.331**	0.400	0.400	81	83	57 - 107	2	22	
Pentachlorophenol	**0.759**	**0.772**	0.800	0.800	95	97	44 - 132	2	23	
Pyrene	**0.353**	**0.362**	0.400	0.400	88	91	58 - 111	3	21	
Surrogate:										
2-Fluorophenol					*55*	*61*	*22 - 109*			
Phenol-d6					*71*	*86*	*36 - 110*			
Nitrobenzene-d5					*79*	*85*	*31 - 109*			
2-Fluorobiphenyl					*85*	*89*	*45 - 107*			
2,4,6-Tribromophenol					*97*	*96*	*43 - 124*			
Terphenyl-d14					*86*	*86*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**EVAMS-1M-2020**					
Laboratory ID:	08-010-01					
Total Solids	**18**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**EVAMS-1R-2020**					
Laboratory ID:	08-010-02					
Total Solids	**30**	0.50	SM 2540G	8-12-20	8-13-20	

Date of Report: September 23, 2020
Samples Submitted: August 3, 2020
Laboratory Reference: 2008-010
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:	08-034-02								
	ORIG	DUP							
Total Solids	**55.4**	**56.5**	NA	NA	NA	NA	2	20	
Laboratory ID:	08-034-01								
	ORIG	DUP							
Total Solids	**31.4**	**31.2**	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: 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: 08-010

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	TOCs	PAHs	Phthalates	Zn, Cu	% Moisture TOTAL solids 25406
1	EVAMS-1M-2020	8/3/20	1120	sed	1																					X	X
2	EVAMS-1R-2020	〃	〃	〃	1																		X	X	X		X

	Signature	Company	Date	Time
Relinquished	Brianna Blaud	HEC	8.3.20	1610
Received		OSE	8/3/20	1610
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 23, 2020

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. 2008-034

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 5, 2020.

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 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
Project: 14-05806-000

Case Narrative

Samples were collected on August 3 and 5, 2020 and received by the laboratory on August 5, 2020. 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 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
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-2020**					
Laboratory ID:	08-034-02					
Total Organic Carbon	**3.0**	0.088	EPA 9060A	8-18-20	8-18-20	
Client ID:	**MONT-2R-2020**					
Laboratory ID:	08-034-04					
Total Organic Carbon	**3.7**	0.29	EPA 9060A	8-18-20	8-18-20	

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0818S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-18-20	8-18-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-034-02								
	ORIG	DUP							
Total Organic Carbon	**2.97**	**3.24**	NA	NA	NA	NA	9	25	
SPIKE BLANK									
Laboratory ID:	SB0818S1								
	SB		SB		SB				
Total Organic Carbon	**41.4**		42.1	NA	98	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
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-2020**					
Laboratory ID:	08-034-01					
Copper	**38**	3.2	EPA 6010D	9-17-20	9-17-20	
Zinc	**1100**	8.0	EPA 6010D	9-17-20	9-17-20	
Client ID:	**MONT-2M-2020**					
Laboratory ID:	08-034-03					
Copper	**32**	4.5	EPA 6010D	9-17-20	9-17-20	
Zinc	**440**	11	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CTRY-1R-2020**					
Laboratory ID:	08-034-02					
Naphthalene	**ND**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
2-Methylnaphthalene	**ND**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
1-Methylnaphthalene	**ND**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Dimethylphthalate	**ND**	0.18	EPA 8270E	8-12-20	8-14-20	
Acenaphthylene	**ND**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Acenaphthene	**ND**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Diethylphthalate	**ND**	0.18	EPA 8270E	8-12-20	8-14-20	
Fluorene	**ND**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Phenanthrene	**0.067**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Anthracene	**0.011**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Di-n-butylphthalate	**ND**	0.18	EPA 8270E	8-12-20	8-14-20	
Fluoranthene	**0.15**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Pyrene	**0.13**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Butylbenzylphthalate	**ND**	0.18	EPA 8270E	8-12-20	8-14-20	
Benzo[a]anthracene	**0.064**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Chrysene	**0.079**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.18	EPA 8270E	8-12-20	8-14-20	
Di-n-octylphthalate	**ND**	0.18	EPA 8270E	8-12-20	8-14-20	
Benzo[b]fluoranthene	**0.10**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo(j,k)fluoranthene	**0.030**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[a]pyrene	**0.083**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Indeno[1,2,3-cd]pyrene	**0.063**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Dibenz[a,h]anthracene	**0.013**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[g,h,i]perylene	**0.063**	0.0072	EPA 8270E/SIM	8-12-20	8-15-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*22*	*22 - 109*				
Phenol-d6	*61*	*36 - 110*				
Nitrobenzene-d5	*60*	*31 - 109*				
2-Fluorobiphenyl	*73*	*45 - 107*				
2,4,6-Tribromophenol	*76*	*43 - 124*				
Terphenyl-d14	*71*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-2R-2020**					
Laboratory ID:	08-034-04					
Naphthalene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
2-Methylnaphthalene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
1-Methylnaphthalene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Dimethylphthalate	**ND**	0.047	EPA 8270E	8-12-20	8-14-20	
Acenaphthylene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Acenaphthene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Diethylphthalate	**ND**	0.23	EPA 8270E	8-12-20	8-14-20	
Fluorene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Phenanthrene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Anthracene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Di-n-butylphthalate	**ND**	0.23	EPA 8270E	8-12-20	8-14-20	
Fluoranthene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Pyrene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Butylbenzylphthalate	**ND**	0.23	EPA 8270E	8-12-20	8-14-20	
Benzo[a]anthracene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Chrysene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.23	EPA 8270E	8-12-20	8-14-20	
Di-n-octylphthalate	**ND**	0.23	EPA 8270E	8-12-20	8-14-20	
Benzo[b]fluoranthene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo(j,k)fluoranthene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[a]pyrene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Dibenz[a,h]anthracene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[g,h,i]perylene	**ND**	0.0093	EPA 8270E/SIM	8-12-20	8-15-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*28*	*22 - 109*				
Phenol-d6	*65*	*36 - 110*				
Nitrobenzene-d5	*54*	*31 - 109*				
2-Fluorobiphenyl	*70*	*45 - 107*				
2,4,6-Tribromophenol	*85*	*43 - 124*				
Terphenyl-d14	*69*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	8-12-20	8-13-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*62*	*22 - 109*				
Phenol-d6	*79*	*36 - 110*				
Nitrobenzene-d5	*54*	*31 - 109*				
2-Fluorobiphenyl	*83*	*45 - 107*				
2,4,6-Tribromophenol	*89*	*43 - 124*				
Terphenyl-d14	*83*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0812S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.557**	**0.662**	0.800	0.800	70	83	47 - 104	17	30	
2-Chlorophenol	**0.549**	**0.649**	0.800	0.800	69	81	45 - 108	17	31	
1,4-Dichlorobenzene	**0.278**	**0.300**	0.400	0.400	70	75	41 - 105	8	32	
n-Nitroso-di-n-propylamine	**0.304**	**0.331**	0.400	0.400	76	83	47 - 103	9	28	
1,2,4-Trichlorobenzene	**0.333**	**0.346**	0.400	0.400	83	87	42 - 111	4	32	
4-Chloro-3-methylphenol	**0.728**	**0.730**	0.800	0.800	91	91	61 - 108	0	25	
Acenaphthene	**0.335**	**0.346**	0.400	0.400	84	87	54 - 102	3	23	
4-Nitrophenol	**0.685**	**0.669**	0.800	0.800	86	84	53 - 122	2	24	
2,4-Dinitrotoluene	**0.325**	**0.331**	0.400	0.400	81	83	57 - 107	2	22	
Pentachlorophenol	**0.759**	**0.772**	0.800	0.800	95	97	44 - 132	2	23	
Pyrene	**0.353**	**0.362**	0.400	0.400	88	91	58 - 111	3	21	
Surrogate:										
2-Fluorophenol					*55*	*61*	*22 - 109*			
Phenol-d6					*71*	*86*	*36 - 110*			
Nitrobenzene-d5					*79*	*85*	*31 - 109*			
2-Fluorobiphenyl					*85*	*89*	*45 - 107*			
2,4,6-Tribromophenol					*97*	*96*	*43 - 124*			
Terphenyl-d14					*86*	*86*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
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-2020**					
Laboratory ID:	08-034-01					
Total Solids	**31**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**CTRY-1R-2020**					
Laboratory ID:	08-034-02					
Total Solids	**55**	0.50	SM 2540G	8-12-20	8-13-20	
Client ID:	**MONT-2M-2020**					
Laboratory ID:	08-034-03					
Total Solids	**22**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**MONT-2R-2020**					
Laboratory ID:	08-034-04					
Total Solids	**43**	0.50	SM 2540G	8-12-20	8-13-20	

Date of Report: September 23, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-034
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:	08-034-02								
	ORIG	DUP							
Total Solids	**55.4**	**56.5**	NA	NA	NA	NA	2	20	
Laboratory ID:	08-034-01								
	ORIG	DUP							
Total Solids	**31.4**	**31.2**	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. 08-034

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates							TOTAL SOLIDS 2540G
1	CTRY-1M-2020	8/5/20	0930	Sediment	1		X	X									X
2	CTRY-1R-2020	8/5/20	0930	Sediment	1	X			X	X							↓
3	MONT-2M-2020	8/3/20	1000	Sediment	1		X	X									
4	MONT-2R-2020	8/3/20	1000	Sediment	1	X			X	X							↓
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by [signature] Date 8/5/20 Received by [signature] Date 8/5/20
Firm Herrera Time 1215 Firm OSE Time 1215

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 23, 2020

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. 2008-057

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 6, 2020.

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 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

Case Narrative

Samples were collected on August 6, 2020 and received by the laboratory on August 6, 2020. 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 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1R-2020**					
Laboratory ID:	08-057-02					
Total Organic Carbon	**5.3**	0.20	EPA 9060A	8-26-20	8-26-20	
Client ID:	**SIDL-3R-2020**					
Laboratory ID:	08-057-04					
Total Organic Carbon	**2.4**	0.19	EPA 9060A	8-26-20	8-26-20	

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0826S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	8-26-20	8-26-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-057-02								
	ORIG	DUP							
Total Organic Carbon	**5.33**	**5.49**	NA	NA	NA	NA	3	25	
SPIKE BLANK									
Laboratory ID:	SB0826S1								
	SB		SB		SB				
Total Organic Carbon	**40.7**		42.1	NA	97	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
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:	**DUP-1M-2020**					
Laboratory ID:	08-057-01					
Copper	**17**	4.7	EPA 6010D	9-17-20	9-17-20	
Zinc	**67**	12	EPA 6010D	9-17-20	9-17-20	
Client ID:	**SIDL-3M-2020**					
Laboratory ID:	08-057-03					
Copper	**19**	4.3	EPA 6010D	9-17-20	9-17-20	
Zinc	**76**	11	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1R-2020**					
Laboratory ID:	08-057-02					
Naphthalene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
2-Methylnaphthalene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
1-Methylnaphthalene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Dimethylphthalate	**ND**	0.050	EPA 8270E	8-12-20	8-14-20	
Acenaphthylene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Acenaphthene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Diethylphthalate	**ND**	0.25	EPA 8270E	8-12-20	8-14-20	
Fluorene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Phenanthrene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Anthracene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Di-n-butylphthalate	**ND**	0.25	EPA 8270E	8-12-20	8-14-20	
Fluoranthene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Pyrene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Butylbenzylphthalate	**ND**	0.25	EPA 8270E	8-12-20	8-14-20	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Chrysene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.25	EPA 8270E	8-12-20	8-14-20	
Di-n-octylphthalate	**ND**	0.25	EPA 8270E	8-12-20	8-14-20	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	8-12-20	8-15-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*32*	*22 - 109*				
Phenol-d6	*75*	*36 - 110*				
Nitrobenzene-d5	*71*	*31 - 109*				
2-Fluorobiphenyl	*78*	*45 - 107*				
2,4,6-Tribromophenol	*86*	*43 - 124*				
Terphenyl-d14	*75*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SIDL-3R-2020**					
Laboratory ID:	08-057-04					
Naphthalene	**ND**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
2-Methylnaphthalene	**ND**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
1-Methylnaphthalene	**ND**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Dimethylphthalate	**ND**	0.041	EPA 8270E	8-12-20	8-14-20	
Acenaphthylene	**0.011**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Acenaphthene	**ND**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Diethylphthalate	**ND**	0.20	EPA 8270E	8-12-20	8-14-20	
Fluorene	**ND**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Phenanthrene	**0.065**	0.041	EPA 8270E	8-12-20	8-14-20	
Anthracene	**0.017**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Di-n-butylphthalate	**ND**	0.20	EPA 8270E	8-12-20	8-14-20	
Fluoranthene	**0.069**	0.041	EPA 8270E	8-12-20	8-14-20	
Pyrene	**0.087**	0.041	EPA 8270E	8-12-20	8-14-20	
Butylbenzylphthalate	**ND**	0.20	EPA 8270E	8-12-20	8-14-20	
Benzo[a]anthracene	**0.044**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Chrysene	**0.043**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.20	EPA 8270E	8-12-20	8-14-20	
Di-n-octylphthalate	**ND**	0.20	EPA 8270E	8-12-20	8-14-20	
Benzo[b]fluoranthene	**0.037**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo(j,k)fluoranthene	**0.012**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[a]pyrene	**0.045**	0.041	EPA 8270E	8-12-20	8-14-20	
Indeno[1,2,3-cd]pyrene	**0.021**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Dibenz[a,h]anthracene	**ND**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Benzo[g,h,i]perylene	**0.019**	0.0081	EPA 8270E/SIM	8-12-20	8-15-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*25*	*22 - 109*				
Phenol-d6	*66*	*36 - 110*				
Nitrobenzene-d5	*59*	*31 - 109*				
2-Fluorobiphenyl	*70*	*45 - 107*				
2,4,6-Tribromophenol	*80*	*43 - 124*				
Terphenyl-d14	*72*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	8-12-20	8-13-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	8-12-20	8-13-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	8-12-20	8-12-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*62*	*22 - 109*				
Phenol-d6	*79*	*36 - 110*				
Nitrobenzene-d5	*54*	*31 - 109*				
2-Fluorobiphenyl	*83*	*45 - 107*				
2,4,6-Tribromophenol	*89*	*43 - 124*				
Terphenyl-d14	*83*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0812S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.557**	**0.662**	0.800	0.800	70	83	47 - 104	17	30	
2-Chlorophenol	**0.549**	**0.649**	0.800	0.800	69	81	45 - 108	17	31	
1,4-Dichlorobenzene	**0.278**	**0.300**	0.400	0.400	70	75	41 - 105	8	32	
n-Nitroso-di-n-propylamine	**0.304**	**0.331**	0.400	0.400	76	83	47 - 103	9	28	
1,2,4-Trichlorobenzene	**0.333**	**0.346**	0.400	0.400	83	87	42 - 111	4	32	
4-Chloro-3-methylphenol	**0.728**	**0.730**	0.800	0.800	91	91	61 - 108	0	25	
Acenaphthene	**0.335**	**0.346**	0.400	0.400	84	87	54 - 102	3	23	
4-Nitrophenol	**0.685**	**0.669**	0.800	0.800	86	84	53 - 122	2	24	
2,4-Dinitrotoluene	**0.325**	**0.331**	0.400	0.400	81	83	57 - 107	2	22	
Pentachlorophenol	**0.759**	**0.772**	0.800	0.800	95	97	44 - 132	2	23	
Pyrene	**0.353**	**0.362**	0.400	0.400	88	91	58 - 111	3	21	
Surrogate:										
2-Fluorophenol					*55*	*61*	*22 - 109*			
Phenol-d6					*71*	*86*	*36 - 110*			
Nitrobenzene-d5					*79*	*85*	*31 - 109*			
2-Fluorobiphenyl					*85*	*89*	*45 - 107*			
2,4,6-Tribromophenol					*97*	*96*	*43 - 124*			
Terphenyl-d14					*86*	*86*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1M-2020**					
Laboratory ID:	08-057-01					
Total Solids	**21**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**DUP-1R-2020**					
Laboratory ID:	08-057-02					
Total Solids	**40**	0.50	SM 2540G	8-12-20	8-13-20	
Client ID:	**SIDL-3M-2020**					
Laboratory ID:	08-057-03					
Total Solids	**23**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**SIDL-3R-2020**					
Laboratory ID:	08-057-04					
Total Solids	**49**	0.50	SM 2540G	8-12-20	8-13-20	

Date of Report: September 23, 2020
Samples Submitted: August 6, 2020
Laboratory Reference: 2008-057
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:	08-034-02								
	ORIG	DUP							
Total Solids	**55.4**	**56.5**	NA	NA	NA	NA	2	20	
Laboratory ID:	08-034-01								
	ORIG	DUP							
Total Solids	**31.4**	**31.2**	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

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: John Lenth

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
__X__ Standard

Laboratory No. 08-057

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates							TOTAL SOLIDS 2540G
1	DUP-1M-2020	8.6.20	12:00	Sediment	1		X	X									X
2	DUP-1R-2020	↓	↓	Sediment	1	X			X	X							↓
3	SIDL-3M-2020			Sediment	1		X	X									
4	SIDL-3R-2020			Sediment	1	X			X	X							
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by Kyle Bliss Date 8.6.20 Received by _____ Date 8/6/20

Firm HERRera Time 18:15 Firm ORE Time 1815

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 23, 2020

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. 2008-129

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 13, 2020.

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 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

Case Narrative

Samples were collected on August 12 and 13, 2020 and received by the laboratory on August 13, 2020. 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 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
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-2020**					
Laboratory ID:	08-129-01					
Total Organic Carbon	**4.6**	0.20	EPA 9060A	9-2-20	9-2-20	
Client ID:	**TYLR-2R-2020**					
Laboratory ID:	08-129-03					
Total Organic Carbon	**6.6**	0.33	EPA 9060A	9-2-20	9-2-20	

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0902S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	9-2-20	9-2-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	08-129-01								
	ORIG	DUP							
Total Organic Carbon	**4.55**	**4.85**	NA	NA	NA	NA	6	25	
SPIKE BLANK									
Laboratory ID:	SB0902S1								
	SB		SB		SB				
Total Organic Carbon	**41.5**		42.1	NA	99	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
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-2020**					
Laboratory ID:	08-129-02					
Copper	**27**	2.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**360**	5.1	EPA 6010D	9-17-20	9-17-20	
Client ID:	**TYLR-2M-2020**					
Laboratory ID:	08-129-04					
Copper	**83**	4.5	EPA 6010D	9-17-20	9-17-20	
Zinc	**930**	11	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-3R-2020**					
Laboratory ID:	08-129-01					
Naphthalene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
2-Methylnaphthalene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
1-Methylnaphthalene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Dimethylphthalate	**ND**	0.21	EPA 8270E	8-20-20	8-20-20	
Acenaphthylene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Acenaphthene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Diethylphthalate	**ND**	0.21	EPA 8270E	8-20-20	8-20-20	
Fluorene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Phenanthrene	**0.039**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Anthracene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Di-n-butylphthalate	**ND**	0.21	EPA 8270E	8-20-20	8-20-20	
Fluoranthene	**0.082**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Pyrene	**0.068**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Butylbenzylphthalate	**ND**	0.21	EPA 8270E	8-20-20	8-20-20	
Benzo[a]anthracene	**0.030**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Chrysene	**0.040**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.25	EPA 8270E	8-20-20	8-20-20	U1
Di-n-octylphthalate	**ND**	0.21	EPA 8270E	8-20-20	8-20-20	
Benzo[b]fluoranthene	**0.058**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Benzo(j,k)fluoranthene	**0.017**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Benzo[a]pyrene	**0.041**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Indeno[1,2,3-cd]pyrene	**0.034**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Dibenz[a,h]anthracene	**ND**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Benzo[g,h,i]perylene	**0.035**	0.0084	EPA 8270E/SIM	8-20-20	8-24-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*56*	*22 - 109*				
Phenol-d6	*81*	*36 - 110*				
Nitrobenzene-d5	*77*	*31 - 109*				
2-Fluorobiphenyl	*82*	*45 - 107*				
2,4,6-Tribromophenol	*80*	*43 - 124*				
Terphenyl-d14	*76*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TYLR-2R-2020**					
Laboratory ID:	08-129-03					
Naphthalene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
2-Methylnaphthalene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
1-Methylnaphthalene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Dimethylphthalate	**ND**	0.16	EPA 8270E	8-20-20	8-20-20	
Acenaphthylene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Acenaphthene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Diethylphthalate	**ND**	0.16	EPA 8270E	8-20-20	8-20-20	
Fluorene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Phenanthrene	**0.023**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Anthracene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Di-n-butylphthalate	**ND**	0.16	EPA 8270E	8-20-20	8-20-20	
Fluoranthene	**0.050**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Pyrene	**0.039**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Butylbenzylphthalate	**ND**	0.16	EPA 8270E	8-20-20	8-20-20	
Benzo[a]anthracene	**0.025**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Chrysene	**0.025**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.16	EPA 8270E	8-20-20	8-20-20	
Di-n-octylphthalate	**ND**	0.16	EPA 8270E	8-20-20	8-20-20	
Benzo[b]fluoranthene	**0.037**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Benzo(j,k)fluoranthene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Benzo[a]pyrene	**0.035**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Indeno[1,2,3-cd]pyrene	**0.022**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Dibenz[a,h]anthracene	**ND**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Benzo[g,h,i]perylene	**0.020**	0.012	EPA 8270E/SIM	8-20-20	8-24-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*40*	*22 - 109*				
Phenol-d6	*66*	*36 - 110*				
Nitrobenzene-d5	*55*	*31 - 109*				
2-Fluorobiphenyl	*69*	*45 - 107*				
2,4,6-Tribromophenol	*77*	*43 - 124*				
Terphenyl-d14	*73*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0820S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	8-20-20	8-20-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	8-20-20	8-20-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	8-20-20	8-20-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	8-20-20	8-20-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	8-20-20	8-20-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	8-20-20	8-20-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	8-20-20	8-20-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*72*	*22 - 109*				
Phenol-d6	*86*	*36 - 110*				
Nitrobenzene-d5	*79*	*31 - 109*				
2-Fluorobiphenyl	*83*	*45 - 107*				
2,4,6-Tribromophenol	*98*	*43 - 124*				
Terphenyl-d14	*90*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0820S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.626**	**0.633**	0.800	0.800	78	79	47 - 104	1	30	
2-Chlorophenol	**0.660**	**0.663**	0.800	0.800	83	83	45 - 108	0	31	
1,4-Dichlorobenzene	**0.308**	**0.312**	0.400	0.400	77	78	41 - 105	1	32	
n-Nitroso-di-n-propylamine	**0.332**	**0.347**	0.400	0.400	83	87	47 - 103	4	28	
1,2,4-Trichlorobenzene	**0.325**	**0.331**	0.400	0.400	81	83	42 - 111	2	32	
4-Chloro-3-methylphenol	**0.712**	**0.759**	0.800	0.800	89	95	61 - 108	6	25	
Acenaphthene	**0.319**	**0.335**	0.400	0.400	80	84	54 - 102	5	23	
4-Nitrophenol	**0.690**	**0.750**	0.800	0.800	86	94	53 - 122	8	24	
2,4-Dinitrotoluene	**0.328**	**0.354**	0.400	0.400	82	89	57 - 107	8	22	
Pentachlorophenol	**0.709**	**0.714**	0.800	0.800	89	89	44 - 132	1	23	
Pyrene	**0.334**	**0.369**	0.400	0.400	84	92	58 - 111	10	21	
Surrogate:										
2-Fluorophenol					*79*	*83*	*22 - 109*			
Phenol-d6					*89*	*91*	*36 - 110*			
Nitrobenzene-d5					*81*	*86*	*31 - 109*			
2-Fluorobiphenyl					*82*	*91*	*45 - 107*			
2,4,6-Tribromophenol					*93*	*95*	*43 - 124*			
Terphenyl-d14					*80*	*91*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TOSH-3R-2020**					
Laboratory ID:	08-129-01					
Total Solids	**48**	0.50	SM 2540G	8-20-20	8-21-20	
Client ID:	**TOSH-3M-2020**					
Laboratory ID:	08-129-02					
Total Solids	**49**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**TYLR-2R-2020**					
Laboratory ID:	08-129-03					
Total Solids	**32**	0.50	SM 2540G	8-20-20	8-21-20	
Client ID:	**TYLR-2M-2020**					
Laboratory ID:	08-129-04					
Total Solids	**22**	0.50	SM 2540G	9-18-20	9-21-20	

Date of Report: September 23, 2020
Samples Submitted: August 13, 2020
Laboratory Reference: 2008-129
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:	08-129-01								
	ORIG	DUP							
Total Solids	**47.5**	**56.9**	NA	NA	NA	NA	18	20	
Laboratory ID:	08-034-01								
	ORIG	DUP							
Total Solids	**31.4**	**31.2**	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

08-129

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.

Requested Analyses

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Total Organic Carbon	Copper	Zinc	Polycyclic aromatic hydrocarbons	Phthalates				Total Solids 2540 G			
1	TOSH-3R-2020	8/12/20	0930	Sediment	1	X			X	X				X			
2	TOSH-3M-2020	8/12/20	0930	Sediment	1		X	X						X			
3	TYLR-2R-2020	8/13/20	1000	Sediment	1	X			X	X				X			
4	TYLR-2M-2020	8/13/20	1000	Sediment	1		X	X						X			
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												
				Sediment	1												

Relinquished by Nina Macs Date 8/13/20 Received by [illegible] Date 8/13/20

Firm Herrera Time 1250 Firm OSE Time 1250

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 23, 2020

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. 2009-037

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on September 3, 2020.

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 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

Case Narrative

Samples were collected on September 1, 2 and 3, 2020 and received by the laboratory on September 3, 2020. 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 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
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-3R-2020**					
Laboratory ID:	09-037-02					
Total Organic Carbon	**1.9**	0.11	EPA 9060A	9-14-20	9-14-20	
Client ID:	**MONT-1R-2020**					
Laboratory ID:	09-037-04					
Total Organic Carbon	**3.3**	0.12	EPA 9060A	9-14-20	9-14-20	
Client ID:	**MONT-4R-2020**					
Laboratory ID:	09-037-06					
Total Organic Carbon	**2.6**	0.11	EPA 9060A	9-14-20	9-14-20	

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

TOTAL ORGANIC CARBON
EPA 9060A
QUALITY CONTROL

Matrix: Sediment
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0914S1					
Total Organic Carbon	**ND**	0.042	EPA 9060A	9-14-20	9-14-20	

Analyte	Result		Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE									
Laboratory ID:	09-037-06								
	ORIG	DUP							
Total Organic Carbon	**2.58**	**2.73**	NA	NA	NA	NA	6	25	
SPIKE BLANK									
Laboratory ID:	SB0914S1								
	SB		SB		SB				
Total Organic Carbon	**41.4**		42.1	NA	98	90-112	NA	NA	

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
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-3M-2020**					
Laboratory ID:	09-037-01					
Copper	**47**	4.8	EPA 6010D	9-17-20	9-17-20	
Zinc	**780**	12	EPA 6010D	9-17-20	9-17-20	
Client ID:	**MONT-1M-2020**					
Laboratory ID:	09-037-03					
Copper	**30**	2.6	EPA 6010D	9-17-20	9-17-20	
Zinc	**210**	6.6	EPA 6010D	9-17-20	9-17-20	
Client ID:	**TOSH-4M-2020**					
Laboratory ID:	09-037-05					
Copper	**33**	2.2	EPA 6010D	9-17-20	9-17-20	
Zinc	**690**	5.4	EPA 6010D	9-17-20	9-17-20	

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

TOTAL METALS
EPA 6010D
QUALITY CONTROL

Matrix: Sediment
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0917SM1					
Copper	**ND**	1.0	EPA 6010D	9-17-20	9-17-20	
Zinc	**ND**	2.5	EPA 6010D	9-17-20	9-17-20	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-037-03										
	ORIG	DUP									
Copper	**11.4**	**11.4**	NA	NA		NA		NA	0	20	
Zinc	**81.5**	**81.3**	NA	NA		NA		NA	0	20	
MATRIX SPIKES											
Laboratory ID:	09-037-03										
	MS	MSD	MS	MSD		MS	MSD				
Copper	**58.7**	**57.6**	50.0	50.0	11.4	**95**	**93**	75-125	2	20	
Zinc	**172**	**167**	100	100	81.5	**91**	**85**	75-125	3	20	

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-3R-2020**					
Laboratory ID:	09-037-02					
Naphthalene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
2-Methylnaphthalene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
1-Methylnaphthalene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Dimethylphthalate	**ND**	0.037	EPA 8270E	9-11-20	9-11-20	
Acenaphthylene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Acenaphthene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Diethylphthalate	**ND**	0.19	EPA 8270E	9-11-20	9-11-20	
Fluorene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Phenanthrene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Anthracene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Di-n-butylphthalate	**ND**	0.19	EPA 8270E	9-11-20	9-11-20	
Fluoranthene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Pyrene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Butylbenzylphthalate	**ND**	0.19	EPA 8270E	9-11-20	9-11-20	
Benzo[a]anthracene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Chrysene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.19	EPA 8270E	9-11-20	9-11-20	
Di-n-octylphthalate	**ND**	0.19	EPA 8270E	9-11-20	9-11-20	
Benzo[b]fluoranthene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo(j,k)fluoranthene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[a]pyrene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Dibenz[a,h]anthracene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[g,h,i]perylene	**ND**	0.0074	EPA 8270E/SIM	9-11-20	9-14-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*57*	*22 - 109*				
Phenol-d6	*66*	*36 - 110*				
Nitrobenzene-d5	*60*	*31 - 109*				
2-Fluorobiphenyl	*66*	*45 - 107*				
2,4,6-Tribromophenol	*83*	*43 - 124*				
Terphenyl-d14	*69*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-1R-2020**					
Laboratory ID:	09-037-04					
Naphthalene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
2-Methylnaphthalene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
1-Methylnaphthalene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Dimethylphthalate	**ND**	0.041	EPA 8270E	9-11-20	9-11-20	
Acenaphthylene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Acenaphthene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Diethylphthalate	**ND**	0.21	EPA 8270E	9-11-20	9-11-20	
Fluorene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Phenanthrene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Anthracene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Di-n-butylphthalate	**ND**	0.21	EPA 8270E	9-11-20	9-11-20	
Fluoranthene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Pyrene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Butylbenzylphthalate	**ND**	0.21	EPA 8270E	9-11-20	9-11-20	
Benzo[a]anthracene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Chrysene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.21	EPA 8270E	9-11-20	9-11-20	
Di-n-octylphthalate	**ND**	0.21	EPA 8270E	9-11-20	9-11-20	
Benzo[b]fluoranthene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo(j,k)fluoranthene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[a]pyrene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Dibenz[a,h]anthracene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[g,h,i]perylene	**ND**	0.0083	EPA 8270E/SIM	9-11-20	9-14-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*47*	*22 - 109*				
Phenol-d6	*57*	*36 - 110*				
Nitrobenzene-d5	*48*	*31 - 109*				
2-Fluorobiphenyl	*57*	*45 - 107*				
2,4,6-Tribromophenol	*83*	*43 - 124*				
Terphenyl-d14	*67*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM

Matrix: Sediment
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-4R-2020**					
Laboratory ID:	09-037-06					
Naphthalene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
2-Methylnaphthalene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
1-Methylnaphthalene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Dimethylphthalate	**ND**	0.070	EPA 8270E	9-11-20	9-11-20	
Acenaphthylene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Acenaphthene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Diethylphthalate	**ND**	0.14	EPA 8270E	9-11-20	9-11-20	
Fluorene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Phenanthrene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Anthracene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Di-n-butylphthalate	**ND**	0.14	EPA 8270E	9-11-20	9-11-20	
Fluoranthene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Pyrene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Butylbenzylphthalate	**ND**	0.14	EPA 8270E	9-11-20	9-11-20	
Benzo[a]anthracene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Chrysene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.14	EPA 8270E	9-11-20	9-11-20	
Di-n-octylphthalate	**ND**	0.14	EPA 8270E	9-11-20	9-11-20	
Benzo[b]fluoranthene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo(j,k)fluoranthene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[a]pyrene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Dibenz[a,h]anthracene	**ND**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[g,h,i]perylene	**0.0079**	0.0070	EPA 8270E/SIM	9-11-20	9-14-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*60*	*22 - 109*				
Phenol-d6	*64*	*36 - 110*				
Nitrobenzene-d5	*59*	*31 - 109*				
2-Fluorobiphenyl	*57*	*45 - 107*				
2,4,6-Tribromophenol	*77*	*43 - 124*				
Terphenyl-d14	*61*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0911S1					
Naphthalene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
2-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
1-Methylnaphthalene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Dimethylphthalate	**ND**	0.020	EPA 8270E	9-11-20	9-11-20	
Acenaphthylene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Acenaphthene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Diethylphthalate	**ND**	0.10	EPA 8270E	9-11-20	9-11-20	
Fluorene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Phenanthrene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Anthracene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Di-n-butylphthalate	**ND**	0.10	EPA 8270E	9-11-20	9-11-20	
Fluoranthene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Pyrene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Butylbenzylphthalate	**ND**	0.10	EPA 8270E	9-11-20	9-11-20	
Benzo[a]anthracene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Chrysene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
bis(2-Ethylhexyl)phthalate	**ND**	0.10	EPA 8270E	9-11-20	9-11-20	
Di-n-octylphthalate	**ND**	0.10	EPA 8270E	9-11-20	9-11-20	
Benzo[b]fluoranthene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo(j,k)fluoranthene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[a]pyrene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Indeno[1,2,3-cd]pyrene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Dibenz[a,h]anthracene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Benzo[g,h,i]perylene	**ND**	0.0040	EPA 8270E/SIM	9-11-20	9-14-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*81*	*22 - 109*				
Phenol-d6	*83*	*36 - 110*				
Nitrobenzene-d5	*78*	*31 - 109*				
2-Fluorobiphenyl	*88*	*45 - 107*				
2,4,6-Tribromophenol	*105*	*43 - 124*				
Terphenyl-d14	*98*	*52 - 118*				

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

SEMIVOLATILES EPA 8270E/SIM
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0911S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.506**	**0.536**	0.800	0.800	63	67	47 - 104	6	30	
2-Chlorophenol	**0.563**	**0.582**	0.800	0.800	70	73	45 - 108	3	31	
1,4-Dichlorobenzene	**0.269**	**0.272**	0.400	0.400	67	68	41 - 105	1	32	
n-Nitroso-di-n-propylamine	**0.242**	**0.264**	0.400	0.400	61	66	47 - 103	9	28	
1,2,4-Trichlorobenzene	**0.286**	**0.291**	0.400	0.400	72	73	42 - 111	2	32	
4-Chloro-3-methylphenol	**0.624**	**0.694**	0.800	0.800	78	87	61 - 108	11	25	
Acenaphthene	**0.282**	**0.308**	0.400	0.400	71	77	54 - 102	9	23	
4-Nitrophenol	**0.611**	**0.714**	0.800	0.800	76	89	53 - 122	16	24	
2,4-Dinitrotoluene	**0.307**	**0.335**	0.400	0.400	77	84	57 - 107	9	22	
Pentachlorophenol	**0.652**	**0.804**	0.800	0.800	82	101	44 - 132	21	23	
Pyrene	**0.308**	**0.348**	0.400	0.400	77	87	58 - 111	12	21	
Surrogate:										
2-Fluorophenol					*68*	*67*	*22 - 109*			
Phenol-d6					*68*	*72*	*36 - 110*			
Nitrobenzene-d5					*66*	*72*	*31 - 109*			
2-Fluorobiphenyl					*73*	*77*	*45 - 107*			
2,4,6-Tribromophenol					*85*	*95*	*43 - 124*			
Terphenyl-d14					*73*	*83*	*52 - 118*			

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
Project: 14-05806-000

TOTAL SOLIDS
SM 2540G

Matrix: Sediment
Units: % Solids

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MONT-3M-2020**					
Laboratory ID:	09-037-01					
Total Solids	**21**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**MONT-3R-2020**					
Laboratory ID:	09-037-02					
Total Solids	**54**	0.50	SM 2540G	9-10-20	9-11-20	
Client ID:	**MONT-1M-2020**					
Laboratory ID:	09-037-03					
Total Solids	**38**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**MONT-1R-2020**					
Laboratory ID:	09-037-04					
Total Solids	**48**	0.50	SM 2540G	9-10-20	9-11-20	
Client ID:	**TOSH-4M-2020**					
Laboratory ID:	09-037-05					
Total Solids	**46**	0.50	SM 2540G	9-18-20	9-21-20	
Client ID:	**MONT-4R-2020**					
Laboratory ID:	09-037-06					
Total Solids	**57**	0.50	SM 2540G	9-10-20	9-11-20	

Date of Report: September 23, 2020
Samples Submitted: September 3, 2020
Laboratory Reference: 2009-037
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:	09-037-06								
	ORIG	DUP							
Total Solids	**56.8**	**57.3**	NA	NA	NA	NA	1	20	
Laboratory ID:	08-034-01								
	ORIG	DUP							
Total Solids	**31.4**	**31.2**	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: 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: 09-037

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	Phthalates	PAHs	DOC Total Organic Carbon	Cu & Zn	% Moisture & Solids 2540 G
1	MONT-3M-2020	9.1.20	1140	~~Soil~~ Sediment	1																				X	X
2	MONT-3R-2020	9.1.20	1140																			X	X	X		X
3	MONT-1M-2020	9.2.20	1030																						X	X
4	MONT-1R-2020	9.2.20	1030																			X	X	X		X
5	TOSH-4M-2020	9.3.20	1030																						X	X
6	MONT-4R-2020	9.3.20	1030																			X	X	X		X

	Signature	Company	Date	Time
Relinquished	Brianna Blaud	HEC	9.3.20	1310
Received	Nicole B Hein	OSE	9/3/20	1310
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: February 2, 2021

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 7 and September 1, 2020. 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
7/07/20	2007-065	TOSH-1	None
7/09/20	2007-089	COLIN-1, MONT-5	None
7/13/20, 7/15/20	2007-153	EVALLSS, SIDL-2	None
7/15/20	2007-158	TOSH-2	None
7/17/20	2007-172	CTRY-2	None
7/22/20, 7/23/20	2007-231	TYLR-1, MONT-4	None
7/29/20	2007-298	SIDL-1	None
8/03/20	2008-010	EVAMS-1	None
8/03/20, 8/05/20	2008-034	CTRY-1, MONT-2	None
8/06/20	2008-057	SIDL-3	1 field duplicate (DUP)
8/12/20, 8/13/20	2008-129	TOSH-3, TYLR-2	None
9/01/20	2009-037	MONT-1, MONT-3, MONT-4, TOSH-4	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.

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 (93 and 95 percent) and zinc (85 and 91 percent) met the control limits (75 to 125 percent) 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 with Qualification

A field duplicate (QA) of sample SIDL-3 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, with the exception noted below.

The RPD value for TOC (75 percent) exceeded the less than 35 percent criterion established in the QAPP. As shown in the table below, sample SIDL-1 was qualified as estimated (flagged J) due to the field duplicate RPD exceedance.

Date Collected	Parameter	Sample ID	Reason for Qualification	Qualifier
8/16/20	TOC	SIDL-3 and DUP	Field duplicate RPD 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 Q

Laboratory Report for Biological Monitoring

The contents of this appendix are provided in a separate electronic file.

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
HEC20JL	HEC20JL001	Colin Creek	COLIN-1	7/21/2020	100.00%			
HEC20JL	HEC20JL002	Country Creek	CTRY-1	8/5/2020				
HEC20JL	HEC20JL003	Country Creek	CTRY-2	7/17/2020				
HEC20JL	HEC20JL004	Evans Tributary	EVALSS	7/15/2020				
HEC20JL	HEC20JL005	Evans Tributary	EVAMS	8/3/2020		99.65%	0.69%	0.35%
HEC20JL	HEC20JL006	Monticello Creek	MONT-1	9/2/2020				
HEC20JL	HEC20JL007	Monticello Creek	MONT-2	8/3/2020				
HEC20JL	HEC20JL016	Tosh Creek	TOSH-3	8/12/2020				
HEC20JL	HEC20JL017	Tosh Creek	TOSH-4	9/3/2020				
HEC20JL	HEC20JL018	Tyler's Creek	TYLR-1	7/23/2020				
HEC20JL	HEC20JL019	Tyler's Creek	TYLR-2	8/13/2020				
HEC20JL	HEC20JL008	Monticello Creek	MONT-3	9/1/2020	98.58%			
HEC20JL	HEC20JL009	Monticello Creek	MONT-4	7/22/2020				
HEC20JL	HEC20JL010	Monticello Creek	MONT-5	7/9/2020				
HEC20JL	HEC20JL011	Seidel Creek	SIDL-1	7/29/2020		97.92%	2.66%	0.60%
HEC20JL	HEC20JL012	Seidel Creek	SIDL-2	7/13/2020				
HEC20JL	HEC20JL013	Seidel Creek	SIDL-3	8/6/2020				
HEC20JL	HEC20JL014	Tosh Creek	TOSH-1	7/15/2020				
HEC20JL	HEC20JL015	Tosh Creek	TOSH-2	7/15/2020				