



ATTACHMENT 1

Task Order 3

SCOPE OF SERVICES

Mill Creek Park Dam Improvements Project
Field Data Collection and Engineer's Report

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Scope of Services

City of Cosmopolis

Mill Creek Park Dam Improvements Project

Overview

This Project is envisioned to be implemented in several phases using Task Orders. Brief descriptions of the task orders are provided below:

- **Task Order 1 – Data Acquisition and Site Visit (Completed 2012)**
Task Order 1 involved data collection and organization, field visit, identification and confirmation of alternatives to be evaluated, and development of a strategic plan that identified the overall “road map” for advancing this project forward.
- **Task Order 2 – Initial Regulatory Consultation and Preliminary Design Criteria (Completed November 2013)**
Meetings will be held with regulatory agencies to identify project requirements, and identification of activities that will be required to complete the design and environmental compliance. Preliminary design criteria will be developed. The findings will be submitted in a written technical memorandum.
- **Task Order 2.1 – Initial Geotechnical, Environmental, and Survey Services (Completed November 2013)**
To maintain project schedule and obtain information to bridge gaps between Task Orders 2 and 3, one day field visits with associated reporting will be conducted focusing on geotechnical data near the dam, initial wetland identification, and base survey control and mapping. The data will be used to complete Task Order 2 and will serve as the basis for additional related services under Task Order 3.
- **Task Order 3 – Field Data Collection and Engineer’s Report (Current)**
Field data will be collected including geotechnical and environmental baseline data. An Engineer’s Report will be prepared that evaluates how to restore the function and value of the dam. The report will address each of the criteria developed in Task Order 2 and recommend the final configuration (type, size and location) of the dam repair. The Engineer’s Report is anticipated to provide information necessary to prepare and submit long lead permit application to USACE.
- **Task Order 4 - Final Design and Permitting (Future)**
The dam and footbridge replacement elements will be developed into plans and specifications for bidding from construction contractors. Required permit applications will be prepared and submitted.
- **Task Order 5 – Services During Bidding & Construction (Future)**
Bid documents will be developed for the public construction contracting process and services will be provided to assist, as needed, during bidding and construction management/observation. Tasks may include assistance in

answering bidder questions, preparing addenda, tabulating bids, and checking contractor references. Assistance may also be provided in managing construction by performing on site observations, reviewing contractor submittals, managing contractor's requests for information, reviewing progress pay requests, and other construction related engineering services.

HDR Engineering, Inc. (HDR) offers the following scope of services for the City of Cosmopolis (CITY) Mill Creek Park Dam Improvements Project (Project), for Task Order 3 – Field Data Collection and Engineer's Report.

Task 300 – Project Management

Objective: Administer the project and coordinate with the CITY to facilitate project progress and timely completion.

HDR Responsibilities:

1. Prepare and submit monthly invoices and status reports, outlining the work completed during that month, project status, and an outline of issues to be resolved.
2. Perform internal project management reviews and Quality Assurance/Quality Control reviews for project deliverables.

CITY Responsibilities:

1. Payment of progress invoices within periods established in the agreement.

Assumptions:

1. Duration of this task order is estimated to be 5 months.

Deliverables:

1. Monthly status reports with invoices.

Task 310 – Preliminary Cost Estimate to Support City’s Funding Request

Objectives: Based on the findings from Task Orders 2 and 2.1, prepare a preliminary total project cost estimate (design, permitting, and construction) for the City to use for requesting project funding from outside source(s) anticipated in January 2014. The estimate will be budget planning level for the purposes of requesting funding. (Note: An updated estimate will also be prepared at the conclusion of this Task Order No. 3 under Task 380 – Prepare Engineer’s Report when project elements are further advanced).

HDR Services:

1. Prepare preliminary project cost estimate

CITY Responsibilities:

1. Confirm the components of the project to be included in the cost estimate
2. Assist with identification of disposal area for excavated materials.

Assumptions:

1. Cost estimate will be planning level for funding request(s) and/or budgeting. City desires cost estimate to be completed by January 2014 and intends to request

additional project funding from Chehalis Flood Authority and Washington State Legislature.

2. Cost estimate at this stage of the project will include approximately $\pm 50\%$ contingency. The estimate will be based only on preliminary information obtained during previous Task Orders No. 2 and 2.1, and HDR's relevant experience.
3. Estimated cost estimate components:
 - a. Dam repair/replacement
 - b. Pond restoration
 - c. Fish passage
 - at dam location
 - replacement of downstream culverts (at 6 existing locations where Mill Creek passes beneath a City street) to meet fish passage criteria
 - d. New footbridge
 - e. Improved trails to be ADA accessible

Deliverables:

1. Cost estimate (digital copy in pdf format), broken out by component, with up to 3 pages of supporting text to describe the cost estimate details.

Task 321 – Hydrology and Hydraulics

Objectives: Develop feasibility level design information to support design of critical elements.

HDR Services:

1. Dam Break Inundation Analysis - conduct a Dam Break Inundation Analysis to be used for the Downstream Hazard Classification, Inundation Mapping in developing the Emergency Action Plan, aid in selection of design requirements of critical elements, and the incremental damage analysis for sizing the spillway of the proposed dam repair or replacement. Analysis is to include development of initial conditions assumptions, estimation of assumed failure mode, and dam break outflow hydrograph, routing of the hydrograph through the downstream valley, and estimation of inundation levels and timing, and damages to downstream structures. Dam failure will consider both normal pool and maximum storage elevation. A sensitivity analysis will be included. Analyses will conform to Washington Department of Ecology Dam Safety Office Guidelines.
2. Downstream Hazard Classification - determine the Downstream Hazard Classification for use with the Safety Guidelines, an index for establishing general design requirements and criteria, and an index for identifying dams where an emergency action plan is required. The classification will be based on

the Population at Risk (PAR) to represent the potential for loss of life. Property and environmental damages will be evaluated based on relative magnitude. The potential for future downstream development will be investigated to determine if the classification may increase in the future.

3. Inflow Design Flood - design flood hydrograph will be developed using an acceptable numerical technique and used in sizing the hydraulic features of spillways and in determining floodwater storage requirements. The appropriate design step will be selected and design storms and Inflow Design Floods for the short, intermediate, and long duration extreme storms will be developed. Contribution of snowmelt will be considered. Several variations of the design storm will be developed and analyzed in the flood analyses to identify the controlling flood. Probabilistic methods to determine temporal distribution will follow requirements described in *Characteristics of Extreme Precipitation Events in Washington State* and incorporated into *Technical Note 3*. Probabilistic methods to determine spatial distribution will follow methods described in National Weather Service (NWS) Hydrometeorological Report No. 57. Runoff modeling will consider seasonality, initial reservoir inflow, initial soil moisture, contribution of snowmelt, and initial reservoir level. A sensitivity analysis will be completed for the temporal distribution, soil moisture deficits, and information rates, unit hydrograph lag times, snowpack magnitudes, and initial reservoir levels. Acceptable sensitive analysis will be accepted if the parameter(s) have a less than 1 chance in 10 of being exceeded in the season of interest.
4. Reservoir routing – The inflow design floods will be routed through the reservoir using an acceptable numerical technique.
5. Spillway – evaluate and select appropriate spillway type based on Ecology Dam Safety Criteria and consideration of durability, mode of reservoir operation, expected frequency of site visits, control of discharge, ease of maintenance, and energy dissipation at stilling basin. Spillway will include appropriate freeboard, channel sidewalls, identification of expansion joints, water stops, and underdrains. Analysis will include evaluation of up to three (3) alternatives and integration of hydrologic, hydraulic and structural components.
6. Outlet works – determine hydraulic capacity of and elevation of outlet works with consideration of timely drawdown of reservoir in response to emergencies, inspections, and repairs, and sedimentation. Conduits will be vented. Outlets will follow NRCS guidance or similar federal agency
7. Stilling basin – energy dissipation and erosion control measures will be provided at the terminus of the conveyance section of the spillway. Consultant will investigate, coordinate and select type of stilling basin based on spillway, fish passage, and downstream considerations. Energy dissipation will consider erosion protection of stilling basin, and downstream channel tailwater conditions. Layout of spillway basin will follow NRCS guidance or similar federal agency.
8. Reservoir Freeboard – Consultant will determine the reservoir freeboard to establish the elevation of the dam crest relative to normal and maximum operating levels of the reservoir. Determination will include evaluation of both

normal and maximum pool conditions during passage of the inflow design flood and account for wind/wave action, settlement, factor of safety for uncertainties, and geologic hazards such as landslides, mudflows, and seiches from earthquakes to meet Washington State Dam Safety Office requirements.

CITY Responsibilities:

1. Provide input to help define metrics for spillway selection.
2. Provide input on time necessary to drawdown reservoir

Assumptions:

1. HEC-HMS, HEC-RAS, and DAMBRK will not be required for this analysis.
2. Precipitation data will be purchased from National Climate Data Center (NCDC)
3. The Probable Maximum Precipitation (PMP) will be determined following procedures described in DSO Technical Notes 3, Design Storm Construction.
4. A rigorous Incremental Damage Analysis is not required for this stage of the project.

Deliverables:

1. Technical Memo documenting procedure, determination of parameters, and results of analyses for critical elements. Hydrology and Hydraulic Information pertaining to the dam will be documented in a technical memorandum. The task technical memorandum will be up to 30 pages (8.5"x11") plus up to 5 sketches (8.5"x11") in .pdf format.

Task 322 – Geotechnical

Objectives: Collect feasibility level geotechnical site information necessary for development of dam alternatives. Develop a dam alternative that is suitable for the site and meets hydraulic criteria. Identify appropriate design criteria for the selected alternative, and perform preliminary design computations.

HDR Services:

The initial site assessment indicated the existing gravity dam is founded on bedrock and appears to be keyed into bedrock on its left abutment. The assessment also suggested that the top of competent rock extends to the north under the remaining right abutment material. The assessment also suggested that the remaining right abutment material may be liquefiable. The following tasks will be performed to confirm site conditions and develop data necessary for preliminary design of an embankment dam and gravity concrete dam.

Services include:

1. **Review Existing Information:** Existing information including design reports for the existing dam, geologic reports for the area, and seismic data available will be collected and reviewed. Site geometry and data from previous test pits will be reviewed and an exploration plan developed. A site visit will be conducted prior to development of the explorations plan to locate boring sites and develop site specific alternatives for evaluation. The site visit will include the geotechnical engineer, structural engineer, hydraulic engineer, and geologist.
2. **Site Explorations:** Perform five exploratory borings, one on the left abutment, one in the valley section, and three on the right abutment. Soil samples and rock core samples will be collected from each site for laboratory testing. Standard penetration testing using a calibrated hammer will be performed in the soil portion of each hole. Boring logs will be developed for each boring.

<u>Boring</u>	<u>Location</u>	<u>Approx. Depth</u>	<u>Type of boring</u>
1	Left abutment	30' Rock	Rock Core Boring
2	Valley	20' Rock	Rock Core Boring
3	Right Abutment	25' soil/15'rock	Mud Rotary/Rock Core Boring
4	Right Abutment	25' soil/15'rock	Mud Rotary/Rock Core Boring
5	Right Abutment	25' soil/15'rock	Mud Rotary/Rock Core Boring

A geotechnical engineer or geologist will be on site to mark boring locations, observe the drilling operation, collect samples, and log the bore holes.

3. **Laboratory Testing:** Laboratory testing necessary to establish soil and rock material properties will be performed. Testing of the soil and rock samples obtained from the subsurface exploration will be conducted by a qualified testing lab. Soil testing will include gradation testing, natural moisture content, and direct shear. Rock testing will include unconfined compressive testing and direct shear testing. Laboratory testing shall be in accordance with ASTMs, or other approved procedures. Engineer shall include test results and test methods in the Geotechnical Technical Memorandum (TM).
4. **Alternative Development:** Two alternatives will be initially developed, an earth embankment and a concrete gravity structure. Initial alternative development will occur during the initial site visit. The alternatives will be evaluated based on safety, constructability, ability to meet project requirements, and estimated construction cost. Based on the evaluation an alternative will be recommended to the city.
5. **Geotechnical Data and Alternatives Evaluation Technical Memorandum (TM):** Information from Services 1, 2 and 3 above will be used to develop soil

and rock design parameters needed for the analysis of the selected alternative. This information along with the boring logs will become the basis for the data portion of the Geotechnical TM. The TM will discuss general site conditions, including estimated top of competent rock and overburden depths, materials encountered in the bore holes, engineering properties of the materials needed for evaluation of the static stability and seismic response of the selected alternative, seepage under and around the dam, seepage through the right abutment, liquefaction potential of the right abutment, and estimated bearing capacity of the soil and rock for use in the design of a foot bridge. A simplified sliding and overturning analysis of a gravity concrete structure will be performed for both the static and seismic condition. For the seismic condition a pseudostatic analysis will be performed. Based on downstream hazard classifications, probabilistic seismic criteria will be developed. Alternative development, recommended design criteria and analysis of the selected alternative will also be addressed in this TM. This TM will also contain the structural criteria and analysis.

CITY Responsibilities:

1. Provide right of entry for site visit and explorations.
2. Provide/construct access to explorations sites.
3. Provide utility locator services for explorations.
4. Participate in an onsite alternatives development meeting.

Assumptions:

1. All site explorations shall require a single mobilization to the site.
2. Traffic control is not anticipated.
3. Drilling Contractor shall obtain any city, state, or federal permits to perform drilling.
4. No in-water work will be required.
5. Design criteria will be in conformance with Washington Department of Ecology, Dam Safety Office, and supplemented with NRCS guidelines or similar federal agency as appropriate. No access road, drill pad site construction, or vegetation clearing shall be required.
6. No contaminated soil, rock, or groundwater will be encountered. If these are encountered, drilling will cease and the City will be notified.

Deliverables:

1. Draft and final Geotechnical data and alternatives evaluation TM.

Task 323 – Structural

Structural design and analysis is covered under Task 322 - Geotechnical.

Task 324 – Mechanical

Objectives: Prepare preliminary design for the dam's outlet works and spillway control

HDR Services:

1. Outlet Works gates – Based on the flow rates developed during task 321 above, gates will be selected and sized to provide the flow rates required within the stable flow regime for the gate selected. Evaluation will include consideration of the need for both upstream and downstream gates. It is anticipated that the gates will be simple slide gates. Vent piping for an upstream gate will be sized. Design of the outlet pipe(s) will be coordinated with other conceptual tasks related to design of the dam. Consideration will be given to the need for single or dual pipes under the dam. Conceptual design will include consideration of redundancy of systems. One drawing is assumed for needed plan, sections, and details.
2. Spillway Control – if necessary the configuration for stop logs and/or overflow gates to be placed on the spillway to regulate the pond level to meet the administrative needs of the City will be developed. One drawing is assumed for needed plan, sections, and details.
3. Trash Rack and Outlet Structure – the outlet structure will be a concrete “box” attached to the upstream face of the dam with a typical bar screen that complies with NRCS Standards or similar federal agency. It is anticipated that the outlet structure will be developed with excess capacity to account for potential plugging and with a means for cleaning the bar screen without draining the reservoir. Provision will be made for emergency draining of the pond if the bar screen is plugged. One drawing is assumed for needed plan, sections, and details.

CITY Responsibilities:

1. Review approach for outlet works gates, spillway control, trash rack and outlet structure and confirm City's preferences.

Assumptions:

1. Assumptions for this task are included in the services statements above.

Deliverables:

1. Three conceptual level drawings in a draft and final format.

Task 325 – Civil Drawings

Objectives: Provide preliminary plan and profile drawings of the dam, pond, and downstream culverts for use by environmental and permitting to develop appropriate permit drawings.

HDR Services:

1. Prepare preliminary level plan and profile drawings of reservoir, dam, and culverts to support public notice for USACE Individual Permit Application. Up to 15 sheets will be developed as follows.
 1. Dam plan and profile sheet (1)
 2. Spillway Plan and profile (1)
 3. Stilling Basin Plan and profile (1)
 4. Outlet Structure Plan and profile (1)
 5. Excavation plan for pond sheet (1)
 6. Pond cross section sheet (1)
 7. Fish passage plan and profile sheet (1)
 8. Six (6) culvert plan and profile sheets (6)

CITY Responsibilities:

1. Review draft drawings to ensure proposed changes are consistent with City direction.

Assumptions:

1. Feasibility level drawings developed from Survey Task to be used by environmental for development of permit drawings.

Deliverables:

1. Feasibility level drawing sheets in plan profile format of pond, dam and downstream culverts.

Task 326 – Electrical

Objectives: Prior (1982) City Mill Creek drawings showed plans for a 50 kw small scale hydroelectric generator demonstration project. At the City's request, HDR will perform a preliminary feasibility study to determine if a small hydropower facility incorporated with the dam improvements would be cost effective. Otherwise, there are no other electrical elements expected to be incorporated with the dam improvements.

HDR Services:

1. Obtain Supporting Data –HDR will obtain historic flow data for Mill Creek or work with the City to estimate historic flows based on a combination of measurements and/or anecdotal data. The flow data will be developed for what can be considered to be an average annual set of runoff values. In addition, the work will be coordinated with the conceptual design of the dam to properly determine head that will be available for power production. Flow data will be modified to reflect the potential impacts of providing flows for fish passage.
2. Preliminary Conceptual Configuration – using available mapping the project will be laid out based on HDR experience with other small, low-head hydro installations. The layout will include discussion of hydro machines applicable to this site. Equipment selection will be based on HDR experience at similar installations. The electrical interconnection will be discussed with City Staff and the local electric utility to identify an acceptable approach and location for equipment. The conceptual layout will be used to estimate the project cost. It is anticipated that conceptual costs will be based on general unit prices such as the cost per KW for development of similar small hydro facilities and modified based on known conditions specific to this facility.
3. Develop Energy Model – using existing tools for conceptual evaluation of small hydro projects, the flow, head and equipment data will be used to estimate annual energy production and potential revenues. Revenue estimates will be limited in scope and will not account for the vast array of tax credits, grant programs, and other financial advantages that may be available to the City if the project is formally pursued. Instead, average values for energy and power that HDR has recently seen on similar projects will be used. Return on Investment estimates will be based on a simple payout structure without consideration of discount rates.
4. Meet with City Staff – HDR will meet with City Staff to discuss the preliminary findings, adjust the project layout, revise the energy model and evaluate known pros and cons common to these kinds of projects. Pros and cons will include a general discussion of permitting requirements, implications of FERC involvement, and the potential value of the project. HDR anticipates that this meeting can take place over the phone with the HDR PM and City Staff together in Cosmopolis.
5. Refine the Concept – based on the meeting with the City, the conceptual layout, energy model, estimate of revenue and costs, and other factors that may contribute to the City’s consideration of whether or not to pursue the project will be revised and incorporated into a draft technical memorandum to be submitted to the City.
6. Develop Final Tech Memo – City comments will be addressed and incorporated into the draft memo. A final technical memorandum will be developed to be incorporated into the Engineering report.

CITY Responsibilities:

1. Provide historic flow information the City has (if available).
2. Work with HDR to develop an acceptable flow record to be used in the analysis by discussing historical observations, impacts of assumptions on potential energy production, and potential project configurations.
3. Facilitate discussions with local electric utility providers for assessment of interconnection requirements and potential revenues.

Assumptions:

1. Minimal contact with equipment vendors will be required, instead typical values for equipment costs, civil costs, power revenues, etc. will be used based on historical costs at other similar installations.
2. No effort will be made to investigate the specifics of tax advantages and/or grants and bonds that could be used by the City to fund the project. Instead information from past HDR experience will be used.
3. No contact will be made with FERC to discuss the project.

Deliverables:

1. Hydropower Technical Memorandum – submitted as a draft and as a final.

Task 330 – Environmental

Objectives: Conduct the field work and documentation to assist the design team with alternative development and design. Continue agency coordination and prepare the JARPA package for submittal to the USACE.

HDR Services:

1. **Right-of-Entry Support** – In advance of the field work, properties not owned by the City to be surveyed by the biologist teams must have signed right-of-entry approvals from those parcels. The Consultant will identify the parcels and provide a map to supplement the letter request to be sent by the City to each owner. The Consultant will provide a general list of field work activities, number of staff and approximate timeframe of the work.
2. **Wetland Field Work** - The Consultant will delineate jurisdictional wetlands within the emptied reservoir pool according to methods described in the 1987 USACE Wetland Delineation Manual and the 1997 Washington State Wetland Delineation Manual. Riparian wetlands downstream of the dam to the first culvert will be delineated as well as those found upstream at the top end of the reservoir to the extents of the parcel are to be delineated to cover areas possibly affected by construction, the fish passage, or mitigation design. Identified wetlands will be documented with appropriate data sheets and boundaries will be marked with

visible plastic flagging for pickup by the survey team. Identified wetlands will be ranked according to City and Ecology methods. Level of effort is anticipated to be 4 days of field work by 4 wetland biologists.

3. **Stream Field Work** - Identification of the OHWM and other features of the Mill Creek channel will be collected and characterized for developing the habitat and aquatic assessment documentation within the emptied reservoir pool and downstream of the dam down to the first culvert. Flagging will be placed for later pick up by the team surveyor. OHWM flagging will also be used to delineate Mill Creek upstream and downstream (approximately 30-50 feet each side) of the culverts and tidegate. Work will be done over 2-3 days by 2 qualified fisheries biologists.
4. **Dam and Reservoir Pool Wetland and Stream Delineation Report** - To document the existing conditions of the current Mill Creek channel and riparian buffer and the wetlands, streams, and floodplain, a Wetland and Stream Delineation Report will be prepared. This document will include an assessment and location of the existing on-site wetlands and description of habitat structures and in-stream features. A functional assessment of the stream and wetlands will be documented and the data sheet included. A discussion of the self-mitigating elements of the project will be provided in this report. This report will be part of the JARPA packet to the USACE for the jurisdictional determination and the overall USACE permit application.
5. **Downstream Culvert Wetland and Stream Delineation Report** – This second wetland and stream delineation report is to focus on the downstream culverts in a separate document from the dam and reservoir. It serves to document existing conditions, the presences of riparian wetlands (if any) immediately up stream and downstream of the culverts, and permanent or temporary impacts to the wetlands or Mill Creek.
6. **Fish and Aquatics Habitat Assessment** – This document will document the fish and aquatic use of Mill Creek and provide an assessment of the change in habitat with the fish passage component and the additional upstream area made available for fish use. The fish habitat analysis report will follow the requirements outlined in the FEMA Guidelines for Floodplain Habitat Assessment and Mitigation.
7. **Alternatives Analysis Report** – As required for the USACE permit, a Section 404 3(b) Alternatives Evaluation is required. An increased level of effort is required for coordination and design activities to support preparation of permit applications triggering an Individual Permit. This includes more analysis of the ‘practicable alternatives’ to demonstrate compliance with the USACE Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (CFR 40 Part 230 Section 404(b)(1)). Subpart (a) of this Guideline stipulates the following:

“...with minor exception, no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long

as the alternative does not have other significant adverse environmental consequences.”

For the purpose of this requirement, practicable alternatives include, but are not limited to:

- Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters;
- Discharges of dredged or fill material at other locations in water of the United States or ocean waters.

HDR will work with the City to develop the Practicable Alternatives to demonstrate compliance with Section 404(b)(1). It is assumed that the alternatives analysis prepared for NEPA will provide the information necessary for evaluation under these Guidelines.

8. **Biological Evaluation** - The proposed action requires federal authorization from the USACE under Section 404 of the Clean Water Act. This federal authorization triggers the need for compliance under Section 7 of the Endangered Species Act (ESA). The Consultant will prepare a Biological Evaluation (BE) that will describe the proposed action and anticipated effects to ESA-listed species that are likely to occur in the project area. Formal ESA consultation is anticipated. The Consultant will prepare a draft BE to be reviewed by the City. The BE will include a comparison of the primary elements of the existing channel and the proposed improvements including quantity and quality of the habitat, pools, riffles, overbank protection, and logs/woody debris. The BE will present the fish exclusion/salvage/removal plan for consideration and approval. HDR will coordinate, as necessary, with NMFS and the USFWS during review of the BE so that the regulatory review agencies have a clear understanding of the project and related actions as they prepare the Biological Opinion. HDR will submit the BE with the Joint Aquatic Resource Protection Application (JARPA) package to be submitted to the USACE.
9. **Agency Coordination** - This task will be on-going through out the life of the project. During preliminary planning and design, coordination with the various stakeholders and permitting agencies will be crucial to determining early the exact permitting needs for the project. Based on our understanding of the project, the Consultant will:
 - Work with the City and the design team to develop a detailed project description to use in discussions with the agencies.
 - As the project advances, coordinate independent project and site visit meetings with staff from the USACE (including biologists from the Services), Washington Department of Fish and Wildlife, Washington Department of Ecology, City of Cosmopolis staff, and Tribal representatives.
 - Organize follow up coordination meetings with each agency during the design development to communicate progress, changes, and schedule. Up to 3 follow up coordination meetings with each agency are envisioned prior to submittal of the permit applications.

- Prepare a comprehensive permit strategy and timeline based on the agency feedback.
- HDR will document with coordination meetings with agendas and notes and will complete a permit strategy and timeline document that will be updated as the project progresses.

10. **SEPA** - HDR will prepare a draft and final SEPA checklist consistent with the requirements of WAC 197-11. All elements of the checklist will be based on the detail developed for the project at the footprint design level. It is assumed that the checklist will result in a Mitigated Determination of Non Significance. Supporting data will be gathered to prepare the checklist using the format provided by the City of Cosmopolis for review, distribution and comment. Upon receipt of consolidated comments, HDR will prepare a final Checklist by incorporating the revisions, recommendations, and directions from the City. The City will prepare the public notice and required distribution lists. Any site posting responsibility will be handled by the City. HDR will provide comment response assistance for up to 6 general comments. Although a large volume of comments is not anticipated, additional budget may be required to support an extensive response to comment effort.
11. **Joint Aquatic Resources Permit Application (JARPA) Preparation** - the Joint Aquatic Resource Protection Application (JARPA) will be completed by HDR for review and signature by the City. HDR will prepare supporting project description materials, including alternatives analysis and compliance with permit justification criteria. The JARPA prepared with this task order will be used to apply only for the USACE at this time. Specific graphics are required to support the JARPA packet. HDR will utilize a combination of GIS and CAD to prepare up to 20 figures and graphics.
12. **Conceptual Mitigation Plan** - The USACE will require review and approval of a wetland/stream mitigation plan prior to permit issuance. The Consultant will prepare up to 3 mitigation concepts within the existing project footprint to avoid costly delays looking for suitable off-site areas that have not been previously reviewed for environmental or cultural resource constraints. HDR biologists shall work with the design team and the City to develop mitigation options for presentation to the agencies. One mitigation workshop attended by 3 HDR staff is anticipated. The conceptual mitigation report shall be prepared to follow the WSDOT mitigation report template and submitted as part of the JARPA.
13. **Jurisdictional Determination by the USACE.** HDR shall coordinate a field visit with the USACE regulatory biologist for wetland and stream jurisdictional determination. Assuming the USACE determines that the wetlands and Mill Creek fall under their authority, impacts such as fill or modification shall require a USACE permit (JARPA) and compliance with the Endangered Species Act (Biological Assessment).

14. Cultural Resources/Section 106 Compliance (Subconsultant: Drayton Archaeology)

Pre-Field. Assist the City with establishing the Area of Potential Effects (APE) by composing maps and a complete description of the undertaking for submittal to the USACE, including documentation from the City to the Washington State Historic Preservation Officer, Quinault, and Chehalis Tribes. Those parties require a project description, noting potential land alterations, staging areas and potential impacts and a mandatory USGS map. A description of the project would be tailored to the issue of cultural resources.

A cultural resources review to meet the mandates of the state Department of Archaeology and Historic Preservation (DAHP) must contain certain elements. Every investigation must include a records search at the DAHP office. A review of files at the DAHP shall be conducted to assure the Consultant is operating with the most accurate data for the site and the surrounding area. Prior to field work a records search at the DAHP would be conducted.

Fieldwork. An appropriate scale of field review for the project would consist of a surface inspection, historic property review, mapping and subsurface testing for the presence of archaeological materials in areas of proposed land alteration and mitigation area(s). A trained archaeological team would cover the area by pedestrian transects reviewing soil exposures and area of impervious surface to assess the potential for archaeological deposits and the best places to excavated soil probes. Built environment structures older than 50 years of age located within the project area and on either side of the culverts would need to be noted and possibly recorded with the state, depending upon the project scope. The scale of subsurface testing for the road and trail alignment would be best served by shovel probes. Mitigation sites would need to be evaluated as identified. Small post-hole sized manually excavated probes excavated with the project area are assumed to be adequate for the compliance need. Areas of subsurface testing and surface inspection would be illustrated on maps for inclusion in reports of findings.

Post-Field. Documentation for the project would include a final report meeting state and federal requirements. If archaeological materials are encountered, a Washington State site inventory form would be required as well. Reporting materials would include bound technical reports in a quantity sufficient for submittal to mandated parties.

CITY Responsibilities:

1. Rights-of-entry to private parcels shall be provided by the City prior to initiation of field efforts.
2. SEPA public notice requirements such as posting, mailings, and hearings shall be handled and paid for by the City.

3. The City shall sign the JARPA as the applicant.

Assumptions:

1. Previous studies that pertain to environmental elements affected by the proposed project shall be provided to Consultant by the City.
2. Any previous wetland delineations or boundary locations completed in the project area and available to City staff shall be provided to Consultant in a suitable format to be used by project designers.
3. This scope of work is to handle the field work and long-lead time permit application to the USACE. Additional scope and budget will be required to prepare application packages for the remainder of the permits needed prior to construction.
4. Scope and budget to handle a SEPA appeal is not included and is considered Extra Work.
5. A City staff representative shall attend any agency required permit meetings.

Deliverables:

Draft and Final versions of the following documents are anticipated. Deliverables below shall include 1 bound hard copy and 1 electronic PDF copy.

1. Dam and Reservoir Pool Wetland and Stream Technical Memorandum with graphics and data sheets.
2. Downstream Culvert Wetland and Stream Delineation Report
3. Fish and Aquatics Habitat Assessment
4. Alternatives Analysis Report
5. Biological Evaluation for Endangered Species
6. SEPA Checklist
7. Conceptual Mitigation Plan
8. JARPA and graphics
9. Cultural Resource Survey

Task 340 – Surveying

Objectives: Perform topographical surveying for the project.

HDR and Subconsultant (Berglund Schmidt & Associates) Services:

1. Perform topographical survey of the following project components/elements:
 - a. Footprint of 10 feet beyond outside of pond loop trail including existing footbridge (to the south/upstream) and the existing light posts.
 - b. Pond area (including existing thalweg) including spot elevations to create 1 foot contours to national mapping standards for topographic surveying.
 - c. Existing dam structure in its current condition

- d. The right abutment of the existing dam i.e. the earth fill embankment from the dam to the upper parking lot near the tennis courts.
- e. The new access trail on the east side of the park from 5th Street to the loop trail
- f. The trail from the parking lot off 5th Street to the dam, proceeding along the existing railroad tie stairs continuing to the C Street parking area.
- g. The upper trail from near the tennis courts to the C Street parking area.
- h. The vegetated area between the upper and lower trails from C Street parking area to the 5th Street parking area
- i. The park area from the dam to C Street.
- j. Mill Creek from the dam to the Grays Harbor County Roadway Maintenance Facility and from the 2nd Street Bridge to the Chehalis River tide gates and levee.
 - Top of bank and thalweg
 - Cross sections as wide as the 100 year flood plain
 - Two cross sections each upstream and downstream of each of the 6 culverts crossing beneath City streets: one cross section immediately at the face of the culvert and the second approximately 30-40' upstream/downstream.
 - The existing footbridge and Highway 101 (1st Street) bridge over Mill Creek
 - Wetland and stream pickups from flags to be placed by HDR environmental staff.
- k. Mill Creek from the Grays Harbor County Roadway Maintenance Facility, to the 2nd Street Bridge.
 - Readily available Lidar information will be used to develop cross sections as wide as the 100-year floodplain
 - Top of bank and thalweg

CITY Responsibilities:

- 1. Provide right of entry for surveyor to access Mill Creek in areas outside of City right-of-way, as required.

Assumptions:

- 1. HDR will subcontract with Berglund Schmidt & Associates to provide surveying services for the project.

Deliverables:

1. Survey base map stamped by licensed surveyor in State of Washington, updated from prior task order.

Task 350 – Fish Passage

Objectives: The overall intent of this task is to assess potential fish passage solutions for the proposed project, -select preliminary design criteria, and develop preferred fish passage concepts that will act as the framework for final design as the project progresses forward in the future.

HDR Services:

1. **Establish Target Fish Species** – HDR will review available background material relative to historic and present fish use, distribution, and migration tendencies throughout the project area. This activity will include additional phone coordination with WDFW biologists.
2. **Establish Range of Anticipated Migration Flows** – HDR will review available hydrologic data and other pertinent studies to help establish design flows which are anticipated to occur throughout the identified migration period for fish species present in the project area. It is understood that gage data may not be available for this watershed and therefore anticipated migration flows may be established by two methods: 1) use of regression equations and general guidelines established by WDFW and USGS for the purposes of estimating flood frequency and fish passage design flows, and/or 2) perform a paired-basin comparison analysis using a similar gages basin in the general region of interest.
3. **Perform Site Reconnaissance** – HDR will conduct a one day site visit to the project area to gain insight on existing physical features that may have bearing on any proposed fish passage structure. As part of this one-day activity, HDR will visit the dam site as well as inspect the six culverts located downstream of the dam location.
4. **Identify Preliminary Design Criteria** – HDR will identify and summarize various types of criteria, codes, standards, design manuals, regulations, guidelines, or accepted design practices that pertain to the development and operation of upstream and downstream fish passage technologies applicable to the dam and culvert replacement components of this project.
5. **Prepare an Interim Design Criteria Technical Memorandum** - Prepare a technical memorandum summarizing anticipated fish passage design and operation criteria. This technical memorandum will be prepared and submitted to the City for distribution to other project stakeholders and agencies such as WDFW for review and comment. Comments received will be reviewed and incorporate into the alternative development and documentation process described in the tasks below.

6. **Perform a Screening Level Assessment of Potential Fish Passage Options**
– HDR will evaluate the applicability of potential fish passage options for the dam and the 6 culverts on Mill Creek downstream of the dam to the Chehalis River levee that cross beneath City streets. Potential fish passage options will be qualitatively evaluated against how well each option measures against 6 selection factors. Options that appear to best meet project objectives will be selected for further evaluation. Options that appear to exhibit fatal flaws or do not measure well against the 6 selection criteria will not be evaluated further.
7. **Formulate Fish Passage Alternatives** – Options selected for further evaluation in previous tasks will be configured into fish passage alternatives. For this task it is assumed that two alternatives will be developed for both the dam and culvert locations (total of 4 alternatives). Alternatives will be developed to a pre-feasibility level based upon available information at the time. As part of this task, narrative descriptions and AACE Class IV Opinion of Probable Construction Costs (OPCCs) will be developed. Also, 11x17 sketches will be generated to illustrate the primary alternative components and basic configuration in plan and elevation.
8. **Prepare a Draft and Final Fish Passage Alternatives Design Document** – HDR will prepare a Draft Fish Passage Design Document which summarizes the methods, results, and conclusions for each of the work activities described under Task 350. This draft document will be prepared and submitted as part of the Draft Engineers Report to the client for distribution to other project stakeholders and agencies such as WDFW for review and comment. Comments received will be reviewed and incorporate into the Final Fish Passage Design Document and included in the Final Engineers Report.

CITY Responsibilities:

1. Provide names and contact information for agencies and individuals that should be included in various reviews of fish passage documentation.
2. Receive and distribute Draft and Final documents to appropriate technical representatives and facilitate timely review of each Draft and Final submittal.
3. Consolidate comments received on each document into one set of comments prior to returning them to the consultant team for review and incorporation. Comments may be provided via comment tracking log and/or tracked changes in MS Word.

Assumptions:

1. Client and stakeholder review and resulting comments will be provided within a typical three week review period.

Deliverables:

1. Draft Technical Memorandum Summarizing Preliminary Fish Passage Criteria
2. Draft and Final Fish Passage Alternatives Design Document to be incorporated in the Draft and Final Engineers Report

Task 360 – Footbridge

Objectives: Prepare a preliminary design for the new footbridge over the dam.

HDR Services:

1. Prepare preliminary footbridge design for up to 3 alternative footbridges (e.g. variation in material type and size) with estimated costs.
2. Prepare footbridge design criteria.

CITY Responsibilities:

1. Provide preferred footbridge material types and sizes.
2. Review draft Technical Memorandum deliverable and select preferred alternative.

Assumptions:

1. The footbridge will span above or near the dam to complete the loop trail.
2. The footbridge loadings will be for pedestrians only and is assumed to be approximately 6 feet wide.
3. Up to 2 drawings per footbridge alternate developed will be provided with the Draft and Final Technical Memorandums. Footbridge drawings will show plan, profile, section, and other pertinent details.
4. The footbridge design criteria and Final Technical Memorandum deliverables will be incorporated in the Engineer's Report in Task 380.

Deliverables:

1. Draft Technical Memorandum summarizing the footbridge alternates developed and cost estimates.
2. Final Technical Memorandum summarizing the footbridge alternates developed, cost estimates, and the City's preferred alternative.
3. Footbridge design criteria.

Task 370 – Trail

Objectives: Incorporate ADA accessibility elements to the park trails and footbridge for the Engineer's Report.

HDR Services:

1. Coordinate with Washington State Recreation and Conservation Office (RCO) regarding ADA standards and guidelines that apply to parks and public spaces.

2. Identify alternatives and modifications to existing trails to provide ADA accessibility.
3. Prepare design criteria for trail improvements to provide ADA accessibility.

CITY Responsibilities:

1. Provide feedback and direction regarding preferences between alternatives, if available.

Assumptions:

1. The design criteria for the trails will be incorporated in the Engineer's Report in Task 380.

Deliverables:

1. None

Task 380 – Prepare Engineer's Report

Objectives: Combine the findings of each task in this task order to prepare the Engineer's Report.

HDR Services:

1. Prepare the draft Engineer's Report (PDF) for City review.
2. Prepare the final Engineer's Report (PDF).

CITY Responsibilities:

1. Review draft report and provide comments to HDR within two weeks of receipt.

Assumptions:

1. The report will evaluate how to restore the function and value of the dam by addressing the design criteria and document the City's preferred alternatives for the project.
2. Field data collection and draft Engineers Report will be up to 150 pages (8.5"x11") plus up to 20 drawings (11"x17") in .pdf format.

Deliverables:

1. One draft of the Engineer's Report (PDF)
2. One final of the Engineer's Report (PDF)

Fee Estimate for Professional Services

The estimated amount to complete the professional services identified in this Scope of Services is offered on a **time-and-materials basis not-to-exceed**. Following are estimated professional services costs for the tasks provided in this scope of services. The following table is provided only to show the CITY an approximate breakdown of estimated costs.

Task	Estimated Task Cost
Task 300 – Project Management	\$15,500
Task 310 – Preliminary Cost Estimate for City’s Funding Request	\$18,400
Task 321 – Hydrology and Hydraulics	\$118,600
Task 322 – Geotechnical	\$81,100
Task 323 – Structural (included in Task 322)	\$
Task 324 – Mechanical	\$13,800
Task 325 – Civil	\$56,600
Task 326 – Electrical	\$7,300
Task 330 - Environmental	\$177,200
Task 340 - Surveying	\$54,900
Task 350 – Fish Passage	\$55,100
Task 360 – Footbridge	\$14,800
Task 370 - Trail	\$9,400
Task 380 – Prepare Engineer’s Report	\$33,500
Total	\$656,200

Professional services rendered in connection with this scope of services will be billed on a time and materials basis based upon the actual hours worked and expenses incurred by HDR and its subconsultant(s) (if applicable) to the estimated total contract amount in accordance with the terms and conditions outlined in the signed Agreement. HDR will not apply a markup to subconsultant invoices and direct expenses associated with this project.