

Council Business Meeting

November 1, 2022

Agenda Item	Personal Services Contract with Cornforth Consultants for Federal Energy Regulatory Commission – Part 12 Level 2 Risk Analysis Probabilistic Loading Conditions Development	
From	Scott Fleury PE	Public Works Director
Contact	Scott.fleury@ashland.or.us	541-552-2412

SUMMARY

Before the Council is a contract for professional engineering services with Cornforth Consultants in the amount of \$232,500 for development of probabilistic loading conditions (seismic & flood) for Hosler Dam as part of the Comprehensive Assessment (CA) and Level 2 Risk Analysis (L2RA) requirements of the Federal Energy Regulatory Commission (FERC) Part 12 program.

POLICIES, PLANS & GOALS SUPPORTED

City Council Goals:

Essential Services

- Drinking Water System
- Stormwater

Enhance Value Services:

- Water Conservation
- Address Climate Change

Department Goals:

- Maintain existing infrastructure to meet regulatory requirements and minimize life-cycle costs
- Deliver timely life cycle capital improvement projects
- Maintain and improve infrastructure that enhances the economic vitality of the community
- Evaluate all city infrastructure regarding planning management and financial resources

PREVIOUS COUNCIL ACTION

The City Council previously approved a professional services contract with Cornforth Consultants to perform the 2018 Part 12 Inspection ([Staff Report](#)). The Council has also approved numerous other professional services contracts for Dam Safety Analysis and Improvements.

BACKGROUND AND ADDITIONAL INFORMATION

The City of Ashland generates hydroelectric power at the Reeder Gulch Powerplant located at the water treatment plant site adjacent to Ashland Creek. As a generator of hydroelectric power, the City falls under the regulatory control of FERC, specifically the Part 12 Safety Inspection program. The Part 12 program is meant to ensure the safe operation of the system and provide protection for the citizens of Ashland. The City has numerous obligations to adhere to for compliance under the FERC Part 12 Safety Inspection Guidelines.

As part of the Part 12D requirements, the City is required to hire an independent consultant every five years to inspect the project and develop a final report that is submitted to FERC for review and comment. In 2022 an update to Chapter 18 Code of Federal Regulations (CFR) Part 12 was released setting new standards for the Dam Safety Inspections that fall under the FERC regulatory umbrella. The updated program now requires a

Comprehensive Assessment (CA) and Periodic Inspection (PI). The CA and PI are performed on alternating five (5) year schedules and FERC has required the 2023 Part 12-D for the City be the first CA for the project. The CA requires an inspection of the project by an Independent Consultant, facilitation of a Potential Failure Modes Workshop and facilitation of a L2RA Workshop.

The scope of work as part of this personal services contract is focused on developing the loading curves required to facilitate the L2RA workshop. Staff will bring forward another contract for the full CA portion of the project at a future date that will include review of all project documentation, physical site inspection and facilitation of the PFMA and L2RA workshops (see CA tasks outlined below). It is time imperative to begin development of the loading curves as soon as possible in order to schedule the inspection and workshops in 2023 and produce the final reporting requirements by the end of 2023.

The purpose of the L2RA is to:

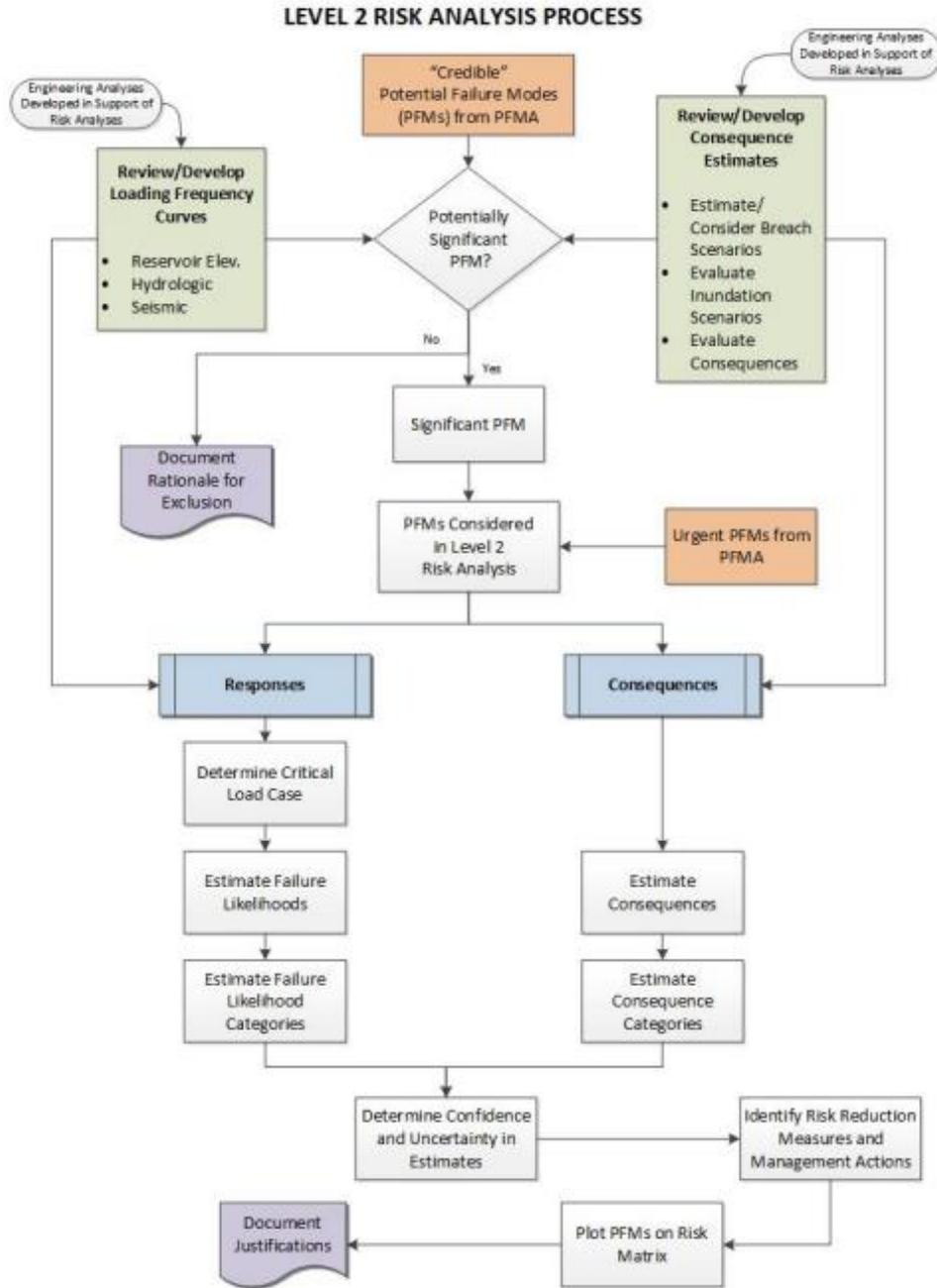
- Evaluate the project potential failure modes and associated risks;
- Identify and prioritize the need for additional studies;
- Identify and prioritize any data collection and analyses;
- Identify operations and maintenance, monitoring, emergency action plan, training and other recurrent needs;
- Provide a better understanding of potential failure modes and a basis for future dam safety inspections and activities;
- Provide support to inform dam safety decisions for taking action (or not) to better define risks through higher level studies, or reduce risks.

L2RA Loading Conditions:

- Hydrologic loading (probabilistic hydrologic hazard curves). Of particular note are the frequencies of: the flood of record, the flood at the peak spillway capacity, the flood at the dam crest, and the projected frequency of the probable maximum flood (PMF).
- Seismic loading (probabilistic seismic hazard curves). Of particular note are the ground motions associated with the approximate return period of the maximum credible earthquake (MCE) and the ground motions used in any previously performed seismic analyses along with their approximate return period.

Previous analysis done over time associated with the project has produced some of the information required to develop the loading conditions, but significant additional work is required, specifically to develop the seismic hazard curves.

Figure 1: L2RA Analysis Process



Comprehensive Assessment Tasks:

1. Develop Part 12D Inspection Plan and IC Team Proposal
 - a. IC and team must meet requirements of 12 CFR (D) 12.31
 - b. IC Approval Requirements: 12 CFR (D) 12.34
 - c. Facilitators Required for L2RA and PFMA
2. Review of Prior Reports to Develop Pre-Inspection Preparation Report
3. Prepare Pre-Inspection Preparation Report (PIPR)
 - a. 12 CFR (D) 12.42
4. General Field Inspection
 - a. 12 CFR (D) 12.32

5. Facilitate, Develop all Requirements and Documentation for the PFMA Session
 - a. Failure has been revised to include not only the loss of the reservoir, but also the inability of the project features or components to perform their intended function and the project features or components performing in an impaired or compromised fashion. This includes misoperation of project elements.
6. Facilitate, Develop all Requirements Documentation for the L2RA Session (current phase)
7. Develop full CA Report following Guidelines
 - a. 12 CFR (D) 12.38
8. Facilitate CA Review Meeting
9. Assist City as needed in Developing Corrective Measures Plan and Schedule

FISCAL IMPACTS

FERC Part 12 requirements are split between the Public Works and Electric Departments. The proposed fee of \$232,500 for the L2RA loading conditions development will be covered by current appropriations within the 2021-2023 Biennium Budget.

STAFF RECOMMENDATION

Staff recommends approval of the personal services contract with Cornforth Consultants.

ACTIONS, OPTIONS & POTENTIAL MOTIONS

I move to approve a personal services contract with Cornforth Consultants in and amount not to exceed \$232,500

REFERENCES & ATTACHMENTS

Attachment #1: Professional Services Contract -Cornforth Consultants

Link #1: Engineering Guidelines for the Evaluation of Hydropower Projects ([FERC Guidelines](#))

Reference:

- Chapter 16 – Part12D Program
- Chapter 18 – Level 2 Risk Analysis

PERSONAL SERVICES AGREEMENT (GREATER THAN \$35,000.00)

<p style="text-align: center;">CITY OF ASHLAND 20 East Main Street Ashland, Oregon 97520 Telephone: 541/488-5587 Fax: 541/488-6006</p>	<p>CONSULTANT: Cornforth Consultants Inc. CONSULTANT’S CONTACT: Gerry Heslin ADDRESS: 10250 SW Greenburg Road, Suite 111 Portland, Oregon 97223 TELEPHONE: (503) 452-1100</p>
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This Personal Services Agreement (hereinafter “Agreement”) is entered into by and between the City of Ashland, an Oregon municipal corporation (hereinafter "City") and Cornforth Consultants Inc. a domestic business corporation ("hereinafter “Consultant”), for 2023 Hosler Dam Comprehensive Assessment.

NOW THEREFORE, in consideration of the mutual covenants contained herein, the City and Consultant hereby agree as follows:

- 1. Effective Date and Duration:** This Agreement shall become effective on the date of execution on behalf of the City, as set forth below (the “Effective Date”), and unless sooner terminated as specifically provided herein, shall terminate upon the City's affirmative acceptance of Consultant's Work as complete and Consultant's acceptance of the City's final payment therefore, but not later than December 31, 2023.
- 2. Scope of Work:** Consultant will provide the 2023 Hosler Dam Comprehensive Assessment as more fully set forth in the Consultant’s Proposal dated September 16, 2022, which is attached hereto as “Exhibit A” and incorporated herein by this reference. Consultant’s services are collectively referred to in this Agreement as the “Work.”
- 3. Supporting Documents/Conflicting Provisions:** This Agreement and any exhibits or other supporting documents shall be construed to be mutually complementary and supplementary wherever possible. In the event of a conflict which cannot be so resolved, the provisions of this Agreement itself shall control over any conflicting provisions in any of the exhibits or supporting documents.
- 4. All Costs Borne by Consultant:** Consultant shall, at its own risk, perform the Work described above and, unless otherwise specified in this Agreement, furnish all labor, equipment, and materials required for the proper performance of such Work.

5. **Qualified Work:** Consultant has represented, and by entering into this Agreement now represents, that all personnel assigned to the Work to be performed under this Agreement are fully qualified to perform the service to which they will be assigned in a skilled and worker-like manner and, if required to be registered, licensed or bonded by the State of Oregon, are so registered, licensed and bonded. Work will be completed within generally accepted standards of professional care followed by practitioners in the same locality and under similar conditions.
6. **Compensation:** City shall pay Consultant the sum of **\$232,500.00 (two hundred thirty-two thousand five hundred dollars)** as full compensation for Consultant's performance of all Work under this Agreement. In no event shall Consultant's total of all compensation and reimbursement under this Agreement exceed the sum of **\$232,500.00 (two hundred thirty-two thousand five hundred dollars)** without the express, written approval from the City official whose signature appears below, or such official's successor in office. Payments shall be made within thirty (30) days of the date of receipt by the City of Consultant's invoice. Should this Agreement be terminated prior to completion of all Work, payments will be made for any phase of the Work completed and accepted as of the date of termination.
7. **Ownership of Work/Documents:** All Work, work product, or other documents produced in furtherance of this Agreement belong to the City, and any copyright, patent, trademark proprietary or any other protected intellectual property right shall vest in and is hereby assigned to the City.
8. **Statutory Requirements:** The following laws of the State of Oregon are hereby incorporated by reference into this Agreement: ORS 279B.220, 279B.230 and 279B.235.
9. **Living Wage Requirements:** If the amount of this Agreement is \$24,050.68 or more, Consultant is required to comply with Chapter 3.12 of the Ashland Municipal Code by paying a living wage, as defined in that chapter, to all employees performing Work under this Agreement and to any Subcontractor who performs 50% or more of the Work under this Agreement. Consultant is also required to post the notice attached hereto as "Exhibit B" predominantly in areas where it will be seen by all employees.
10. **Indemnification:** Consultant hereby agrees to defend, indemnify, save, and hold City, its officers, employees, and agents harmless from any and all losses, claims, actions, costs, expenses, judgments, or other damages resulting from injury to any person (including injury resulting in death), or damage (including loss or destruction) to property, of whatsoever nature to the extent caused by Consultant's willful misconduct or negligent acts, errors or omissions involved with the performance of this Agreement by Consultant (including but not limited to, Consultant's employees, agents, and others designated by Consultant to perform Work or services attendant to this Agreement). However, Consultant shall not be held responsible for any losses, expenses, claims, subrogations, actions, costs, judgments, or other damages, caused solely by the negligence of City.
11. **Termination:**
 - a. Mutual Consent. This Agreement may be terminated at any time by the mutual consent

- of both parties.
- b. City's Convenience. This Agreement may be terminated by City at any time upon not less than thirty (30) days' prior written notice delivered by certified mail or in person.
 - c. For Cause. City may terminate or modify this Agreement, in whole or in part, effective upon delivery of written notice to Consultant, or at such later date as may be established by City under any of the following conditions:
 - i. If City funding from federal, state, county or other sources is not obtained and continued at levels sufficient to allow for the purchase of the indicated quantity of services;
 - ii. If federal or state regulations or guidelines are modified, changed, or interpreted in such a way that the services are no longer allowable or appropriate for purchase under this Agreement or are no longer eligible for the funding proposed for payments authorized by this Agreement; or
 - iii. If any license or certificate required by law or regulation to be held by Consultant to provide the services required by this Agreement is for any reason denied, revoked, suspended, or not renewed.
 - d. For Default or Breach.
 - i. Either City or Consultant may terminate this Agreement in the event of a breach of the Agreement by the other. Prior to such termination the party seeking termination shall give to the other party written notice of the breach and its intent to terminate. If the party committing the breach has not entirely cured the breach within fifteen (15) days of the date of the notice, or within such other period as the party giving the notice may authorize in writing, then the Agreement may be terminated at any time thereafter by a written notice of termination by the party giving notice.
 - ii. Time is of the essence for Consultant's performance of each and every obligation and duty under this Agreement. City, by written notice to Consultant of default or breach, may at any time terminate the whole or any part of this Agreement if Consultant fails to provide the Work called for by this Agreement within the time specified herein or within any extension thereof.
 - iii. The rights and remedies of City provided in this subsection (d) are not exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.
 - e. Obligation/Liability of Parties. Termination or modification of this Agreement pursuant to subsections a, b, or c above shall be without prejudice to any obligations or liabilities of either party already accrued prior to such termination or modification. However, upon receiving a notice of termination (regardless whether such notice is given pursuant to Subsection a, b, c, or d of this section, Consultant shall immediately cease all activities under this Agreement, unless expressly directed otherwise by City in the notice of termination. Further, upon termination, Consultant shall deliver to City all documents, information, works-in-progress and other property that are or would be deliverables had

the Agreement been completed. City shall pay Consultant for Work performed prior to the termination date if such Work was performed in accordance with this Agreement.

12. **Independent Contractor Status:** Consultant is an independent contractor and not an employee of the City for any purpose. Consultant shall have the complete responsibility for the performance of this Agreement. Consultant shall provide workers' compensation coverage as required in ORS Chapter 656 for all persons employed to perform Work pursuant to this Agreement. Consultant is a subject employer that will comply with ORS 656.017.
13. **Assignment:** Consultant shall not assign this Agreement or subcontract any portion of the Work without the written consent of City. Any attempted assignment or subcontract without written consent of City shall be void. Consultant shall be fully responsible for the acts or omissions of any assigns or subcontractors and of all persons employed by them, and the approval by City of any assignment or subcontract of the Work shall not create any contractual relation between the assignee or subcontractor and City.
14. **Default.** The Consultant shall be in default of this Agreement if Consultant: commits any material breach or default of any covenant, warranty, certification, or obligation under the Agreement; institutes an action for relief in bankruptcy or has instituted against it an action for insolvency; makes a general assignment for the benefit of creditors; or ceases doing business on a regular basis of the type identified in its obligations under the Agreement; or attempts to assign rights in, or delegate duties under, this Agreement.
15. **Insurance.** Consultant shall, at its own expense, maintain the following insurance:
 - a. Worker's Compensation insurance in compliance with ORS 656.017, which requires subject employers to provide Oregon workers' compensation coverage for all their subject workers
 - b. Professional Liability insurance with a combined single limit, or the equivalent, of not less than \$2,000,000 (two million dollars) per occurrence. This is to cover any damages caused by error, omission or negligent acts related to the Work to be provided under this Agreement.
 - c. General Liability insurance with a combined single limit, or the equivalent, of not less than \$2,000,000 (two million dollars) per occurrence for Bodily Injury, Death, and Property Damage.
 - d. Automobile Liability insurance with a combined single limit, or the equivalent, of not less than \$1,000,000 (one million dollars) for each accident for Bodily Injury and Property Damage, including coverage for owned, hired or non-owned vehicles, as applicable.
 - e. Notice of cancellation or change. There shall be no cancellation, material change, reduction of limits or intent not to renew the insurance coverage(s) without thirty (30) days' prior written notice from the Consultant or its insurer(s) to the City.
 - f. Additional Insured/Certificates of Insurance. Consultant shall name the City of Ashland, Oregon, and its elected officials, officers and employees as Additional Insureds on any insurance policies, excluding Professional Liability and Workers' Compensation, required herein, but only with respect to Consultant's services to be provided under this Agreement. The consultant's insurance is primary and non-contributory. As evidence of the insurance coverages required

by this Agreement, the Consultant shall furnish acceptable insurance certificates prior to commencing the Work under this Agreement. The certificate will specify all of the parties who are Additional Insureds. Insuring companies or entities are subject to the City's acceptance. If requested, complete copies of insurance policies; trust agreements, etc. shall be provided to the City. The Consultant shall be financially responsible for all pertinent deductibles, self-insured retentions, and/or self-insurance.

- 16. Nondiscrimination:** Consultant agrees that no person shall, on the grounds of race, color, religion, creed, sex, marital status, familial status or domestic partnership, national origin, age, mental or physical disability, sexual orientation, gender identity or source of income, suffer discrimination in the performance of any Work under this Agreement when employed by Consultant. Consultant agrees to comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations. Further, Consultant agrees not to discriminate against a disadvantaged business enterprise, minority-owned business, woman-owned business, a business that a service-disabled veteran owns or an emerging small business enterprise certified under ORS 200.055, in awarding subcontracts as required by ORS 279A.110.

17. Consultant's Compliance With Tax Laws:

17.1 Consultant represents and warrants to the City that:

17.1.1 Consultant shall, throughout the term of this Agreement, including any extensions hereof, comply with:

- (i) All tax laws of the State of Oregon, including but not limited to ORS 305.620 and ORS Chapters 316, 317, and 318;
- (ii) Any tax provisions imposed by a political subdivision of the State of Oregon applicable to Consultant; and
- (iii) Any rules, regulations, charter provisions, or ordinances that implement or enforce any of the foregoing tax laws or provisions.

17.1.2 Consultant, for a period of no fewer than six (6) calendar years preceding the Effective Date of this Agreement, has faithfully complied with:

- (i) All tax laws of the State of Oregon, including but not limited to ORS 305.620 and ORS Chapters 316, 317, and 318;
- (ii) Any tax provisions imposed by a political subdivision of the State of Oregon applicable to Consultant; and
- (iii) Any rules, regulations, charter provisions, or ordinances that implement or enforce any of the foregoing tax laws or provisions.

- 18. Notice.** Whenever notice is required or permitted to be given under this Agreement, such notice shall be given in writing to the other party by personal delivery, by sending via a reputable commercial overnight courier, by mailing using registered or certified United States mail, return receipt requested, postage prepaid, or by electronically confirmed at the address or facsimile number set forth below:

If to the City:

City of Ashland - Public Works Department
Attn: Contract Administrator
20 E. Main Street
Ashland, Oregon 97520
Phone: (541) 488-5587

With a copy to:

City of Ashland - Legal Department
20 E. Main Street
Ashland, Oregon 97520
Phone: (541) 488-5350

If to Consultant:

Cornforth Consultants
10250 SW Greenburg Road, Suite 111
Portland, Oregon 97223

19. **Governing Law.** This Agreement shall be governed by the laws of the State of Oregon without regard to conflict of laws principles. Exclusive venue for litigation of any action arising under this Agreement shall be in the Circuit Court of the State of Oregon for Jackson County unless exclusive jurisdiction is in federal court, in which case exclusive venue shall be in the federal district court for the district of Oregon. Each party expressly waives any and all rights to maintain an action under this Agreement in any other venue, and expressly consents that, upon motion of the other party, any case may be dismissed or its venue transferred, as appropriate, so as to effectuate this choice of venue.
20. **Amendments.** This Agreement may be amended only by written instrument executed by both parties with the same formalities as this Agreement.
21. **Nonappropriations Clause.** Funds Available and Authorized: City has sufficient funds currently available and authorized for expenditure to finance the costs of this Agreement within the City's fiscal year budget. Consultant understands and agrees that City's payment of amounts under this Agreement attributable to Work performed after the last day of the current fiscal year is contingent on City appropriations, or other expenditure authority sufficient to allow City in the exercise of its reasonable administrative discretion, to continue to make payments under this Agreement. In the event City has insufficient appropriations, limitations or other expenditure authority, City may terminate this Agreement without penalty or liability to City, effective upon the delivery of written notice to Consultant, with no further liability to Consultant.
22. **THIS AGREEMENT AND THE ATTACHED EXHIBITS CONSTITUTE THE ENTIRE UNDERSTANDING AND AGREEMENT BETWEEN THE PARTIES. NO WAIVER, CONSENT, MODIFICATION OR CHANGE OF TERMS OF THIS AGREEMENT SHALL BIND EITHER PARTY UNLESS IN WRITING AND SIGNED BY BOTH PARTIES. SUCH WAIVER, CONSENT, MODIFICATION OR CHANGE, IF MADE, SHALL BE EFFECTIVE ONLY IN THE SPECIFIC INSTANCE AND FOR THE SPECIFIC PURPOSE GIVEN.**

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, OR REPRESENTATIONS, ORAL OR WRITTEN, NOT SPECIFIED HEREIN REGARDING THIS AGREEMENT. CONSULTANT, BY SIGNATURE OF ITS AUTHORIZED REPRESENTATIVE, HEREBY ACKNOWLEDGES THAT HE/SHE HAS READ THIS AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS.

23. **Certification.** Consultant shall sign the certification attached hereto as “Exhibit C” and incorporated herein by this reference.

CITY OF ASHLAND:

CORNFORTH CONSULTANTS (CONSULTANT):

By: _____
City Administrator

By: _____
Signature

Printed Name

Printed Name

Date

Title

Date

Purchase Order No. _____

(W-9 is to be submitted with this signed Agreement)

APPROVED AS TO FORM:

Assistant City Attorney

Date

EXHIBIT B

CITY OF ASHLAND, OREGON

City of Ashland
LIVING
WAGE

ALL employers described below must comply with City of Ashland laws regulating payment of a living wage.



\$17.02 per hour, effective **June 30, 2022.**

The Living Wage is adjusted annually every June 30 by the Consumer Price Index.

Employees must be paid a living wage:

- For all hours worked under a service contract between their employer and the City of Ashland if the contract exceeds **\$24,050.68** or more.
- For all hours worked in a month if the employee spends 50% or more of the employee's time in that month working on a project or

portion of business of their employer, if the employer has ten or more employees, and has received financial assistance for the project or business from the City of Ashland in excess of **\$24,050.68.**

- If their employer is the City of Ashland, including the Parks and Recreation Department.
- In calculating the living wage, employers may add the value of health care, retirement,

401K and IRS eligible cafeteria plans (including childcare) benefits to the amount of wages received by the employee.

- **Note:** For temporary and part-time employees, the Living Wage does **not** apply to the first 1040 hours worked in any calendar year. For more details, please see Ashland Municipal Code Section 3.12.020.

For additional information:

Call the Ashland City Administrator's office at 541-488-6002 or write to the City Administrator, City Hall, 20 East Main Street, Ashland, OR 97520, or visit the City's website at www.ashland.or.us.

Notice to Employers: This notice must be posted predominantly in areas where it can be seen by all employees.

CITY OF
ASHLAND

EXHIBIT C

CERTIFICATIONS/REPRESENTATIONS: Consultant, by and through its authorized representative, under penalty of perjury, certifies that (a) the number shown on the attached W-9 form is its correct taxpayer ID (or is waiting for the number to be issued to it and (b) Consultant is not subject to backup withholding because: (i) it is exempt from backup withholding, or (ii) it has not been notified by the Internal Revenue Service (IRS) that it is subject to backup withholding as a result of a failure to report all interest or dividends, or (iii) the IRS has notified it that it is no longer subject to backup withholding. Consultant further represents and warrants to City that: (a) it has the power and authority to enter into this Agreement and perform the Work, (b) the Agreement, when executed and delivered, shall be a valid and binding obligation of Consultant enforceable in accordance with its terms, (c) the work under the Agreement shall be performed in accordance with the highest professional standards, and (d) Consultant is qualified, professionally competent, and duly licensed (if applicable) to perform the Work. Consultant also certifies under penalty of perjury that its business is not in violation of any Oregon tax laws, it is an independent contractor as defined in the Agreement, it is authorized to do business in the State of Oregon, and Consultant has checked four or more of the following criteria that apply to its business.

- _____ (1) Consultant carries out the work or services at a location separate from a private residence or is in a specific portion of a private residence, set aside as the location of the business.
- _____ (2) Commercial advertising or business cards or a trade association membership are purchased for the business.
- _____ (3) Telephone listing is used for the business separate from the personal residence listing.
- _____ (4) Labor or services are performed only pursuant to written contracts.
- _____ (5) Labor or services are performed for two or more different persons within a period of one year.
- _____ (6) Consultant assumes financial responsibility for defective workmanship or for service not provided as evidenced by the ownership of performance bonds, warranties, errors and omission (professional liability) insurance or liability insurance relating to the Work or services to be provided.

Consultant's signature

Date

September 16, 2022

P-1781

Scott Fleury, P.E.
Public Works Director
City of Ashland Public Works
20 East Main Street
Ashland, Oregon 97520

**Proposal for Engineering Support
2023 Hosler Dam Comprehensive Assessment
Ashland, Oregon**

Dear Scott,

In accordance with your request, we are pleased to submit this proposal to provide engineering support related to the 2023 Federal Energy Regulatory Commission (FERC) Comprehensive Assessment at Hosler Dam. The proposed services are to provide probabilistic loading and system response information necessary to complete the risk assessment portion of the Comprehensive Assessment. This letter provides a summary of our proposed work tasks and an estimate of cost to complete these tasks.

The comprehensive assessment (CA) is a more detailed safety review than previous consultant safety inspection reports (CSIRs) completed under the Part 12D program. One key difference between the new CA and previous Part 12D evaluations is the focus on identifying risk-driving potential failure modes (PFMs) for the structure. The CA process incorporates a level 2 risk assessment (L2RA) that roughly follows the semi-quantitative risk assessment (SQRA) methodology developed by the US Army Corps of Engineers and the Bureau of Reclamation. The L2RA involves estimating the annual probability of dam failure as well as the consequences of dam failure under loads with different return periods. In order to support the L2RA, additional analyses are necessary to define the seismic loading, hydrologic loading, and consequences of dam breach in a probabilistic framework.

We propose to team with Gannett Fleming to complete the necessary hazard loading and system response analysis work for the comprehensive assessment. We would utilize specialized resources from their Phoenix, Roseville and Denver offices to complete the proposed work. Our team recently completed one of FERC's pilot projects that assisted the agency to finalize their risk-informed decision making (RIDM) policies. The RIDM policies form the basis for the new periodic inspection (PI) and comprehensive assessment (CA) inspection and reporting requirements.



TASK 1 - SEISMIC HAZARD ANALYSIS

In order to support the L2RA and allow participants to properly estimate the probability of failure, seismic loading for the dam must be presented in a probabilistic framework at several return periods in addition to the deterministic framework required in the FERC guidelines. The existing seismic hazard data in the project's supporting technical information document (STID) is not sufficient to support this, and updated analyses are necessary.

Task 1A - Assemble Existing Information

Task 1 would begin with a desktop study utilizing existing data to inform subsequent analyses. Our team would compile and review existing scientific literature, studies, and maps relevant to updating the geologic and seismologic understanding of the region near Hosler Dam. The data collected is anticipated to include current and readily available references on nearby fault sources and background seismicity. This includes published journal articles United States Bureau of Reclamation (USBR) and the United States Geological Survey (USGS). Any additional geologic information related to the dam and the foundation available from City of Ashland would assist in characterizing the dam site and foundation conditions.

Task 1B - Seismic Source Characterization

The project site is located within the Klamath Mountains in the southwestern part of the state of Oregon approximately 19 km south of Medford Oregon. The seismic hazard at the dam site is comprised of local crustal faulting and the Cascadia Subduction Zone. There are two identified faults within 10 km of the dam site (Siskiyou Pass and Emigrant faults). Previous studies completed by the USBR dated these faults as pre-Quaternary and considered them to be inactive. Our team will review the most-recent understanding of these faults and assess their inclusion in the probabilistic seismic hazard analysis (PSHA). The past deterministic seismic hazard analysis (DSHA) did not address these faults because they were assumed to be inactive. The PSHA includes all fault sources, and accounts for fault activity by assigning faults a probability of activity that is a function of slip rate and likelihood of occurrence.

These two identified faults along with recent geologic and seismologic literature reviewed as part of Task 1 will be used to develop a seismotectonic model for the project site. Faults that are fully characterized in terms of fault length, dip, style of faulting, and slip rate/recurrence will be included as three-dimensional surfaces representing active faults capable of producing earthquakes. Identified fault zones or areas of seismicity within the site region that have similar seismological characteristics (e.g., maximum earthquake magnitude and recurrence) but without fault-specific information will be modeled as shallow source zones or represented by gridded seismicity.

As part of this evaluation, the seismic source characterization will identify uncertainties, data gaps, and recommendations for sensitivity analyses to be included in the seismic hazard analysis. Uncertainty related to source geometry, fault type, seismogenic depth, style of faulting, activity rates, recurrence models, and magnitude characterizations, will be captured through use of a logic tree.

We anticipate that the seismic source characterization will include the following:



- Description of the geologic and seismotectonic setting
- Discussion on historical and background seismicity
- Plots of seismicity illustrating different earthquake magnitudes within the area of interest
- Summary table, description and fault map that includes faults capable of causing hazard to the dam
- Descriptions of each fault and areal source including references and supporting information summarizing parameters used in the seismotectonic model
- Development of logic trees including: probability of activity, sense of slip, seismogenic depth, dip, maximum magnitude, slip rate, segmentation rupture scenarios (as applicable), activity rates, and fault b-value

The STID indicates there is one fault northwest of the dam site and it is mapped within 1 km of the dam, but this does not cross the dam. This fault was noted by Morrison Knudsen in their 1983 and 1993 assessments. Faults located within 5 kilometers of the site will be reviewed and evaluated to a greater level of detail compared to the other faults located further from the site and included in the seismic source model. Field inspection or evaluation of the nearby fault is not planned. The study will include a desktop review of available aerial imagery, published maps, and relevant peer-reviewed literature. Based on this information, the potential for surface faulting and significance to the project will be assessed.

Task 1C - Ground Motion Models

The anticipated ground motions at the dam site will be computed using state-of-the-practice ground motion models (GMMs). For the shallow crustal seismic sources, the NGA-West2 GMMs will be applied and for the subductions source the NGA-Sub GMMs will be used.

Both the NGA-West2 and NGA-Sub projects produced substantial new data resources and simulation results to guide the development of ground motion predictions in active tectonic and subduction regions, respectively. The NGA-West2 and NGA-Sub models were developed based on larger datasets than previous GMMs, working through an iterative process with seismic researchers, and using latest available information and recorded earthquake time histories.

Task 1D - Seismic Hazard Analysis (Probabilistic and Deterministic)

FERC has released risk informed decision-making (RIDM) guidelines for seismic hazards which incorporate the probabilistic hazard framework; however, the existing deterministic criteria in the FERC dam safety guidelines will remain in place for the foreseeable future. We propose to perform seismic hazard analyses in accordance with Chapter 13 of the 2018 FERC Engineering Guidelines, including both probabilistic and deterministic methodologies. Probabilistic seismic hazard results will be used to guide the selection of an appropriate level of ground motion from the deterministic analysis considering fault slip rate and recurrence interval at each source.

The PSHA will be computed using HAZ45 software, developed by Dr. Norm Abrahamson. This code has been validated through the Pacific Earthquake Engineering Research Center's (PEER) "Probabilistic Seismic Hazard Analysis Code Verification" project.



Mean hazard curves for peak ground acceleration (PGA) and the available range of spectral accelerations will be developed. Uniform hazard spectra (UHS) will be produced for return periods of 150-year, 475-year, 975-year, 2,475-year, 5,000-year and 10,000-year. The PSHA results for the dam site will include source contribution hazard plots, deaggregations, and fractiles. The deaggregations will be performed at the following periods - PGA, applicable periods of the dam, 0.2 and 1.0 second spectral acceleration. Results of the seismic hazard analysis will be compared to the published 2018 USGS National Seismic Hazard Mapping Program (NSHMP) and any updated information provided by the USGS.

Based on the deaggregations, deterministic scenario events will be developed and a DSHA will be performed. A safety evaluation earthquake (SEE) and associated design spectra will be selected based on comparison of DSHA response spectra to the UHS developed in the PSHA.

Task 1E - Technical Reporting

A final seismic hazard assessment memorandum will be prepared for Hosler Dam that includes the following elements:

- Documentation of all fault sources and areal source zones
- Documentation on site characterization – VS30 selection (Geophysics report to be attached)
- Logic tree
- Selected GMPEs and weightings
- Inputs required to perform a deterministic analysis
- PSHA and DSHA Results
 - Mean hazard curves from the PSHA
 - UHS for 150, 2,475, 5,000, and 10,000-year return periods
 - Fractiles to present the uncertainty in the mean hazard results
 - Deaggregation tables, plots, and figures for the specified spectral response periods and return periods listed above
 - Comparison of PSHA and DSHA Results
 - Selected Safety Evaluation Earthquake

The technical memorandum would be finalized after receiving comments from the City. If the City anticipates that the FERC will have comments and/or questions on the seismic hazard analyses before the L2RA is completed, some contingency budget may be warranted to prepare responses to their comments. For budgeting purposes, we have included 16 hours (approximately \$3,500) as a contingency item for this task. The contingency budget would only be used if authorized by the City.

TASK 2 - SITE-SPECIFIC SHEAR WAVE VELOCITY MEASUREMENTS

Site response to the seismic sources identified in Task 1 is influenced by many factors. The time averaged shear wave velocity in the upper 30 meters of a site's profile (VS30) is a key element of a seismic hazard assessment since it has a large influence on how seismic energy translates to ground motion at the foundation of the dam.



Our team proposes to subcontract with GeoVision Geophysical Services to perform a non-destructive multi-channel analysis of surface waves (MASW) study at the dam site to obtain shear wave velocity measurements of the dam foundation materials. The results of the MASW geophysical investigations will be used to develop a justifiable VS30 site profile for the dam foundation. The VS30 profile developed from the geophysical model will be used to determine the seismic site classification, which controls the way the site responds to input motions. We anticipate collecting data along two geophysical arrays; one along the access road near the left abutment and one downstream of the dam along the center of the valley. Data collection requires personnel to walk along a roughly linear path to set geophones and data acquisition units. It is assumed that the City of Ashland crews could clear vegetation along the proposed geophysical survey lines prior to the field study. For planning purposes, crews would need vegetation cleared down to the ground surface along a 4-foot-wide path extending approximately 400 feet downstream of the dam.

The field data, interpretation, and conclusions would be summarized in a brief technical report prepared by GeoVision. Our team would complete a Level 2 review of the analysis and interpretation in the report. A Level 2 review is a technical review of a work product or service by a qualified individual or individuals, other than the originator, for suitability to the audience, match to client requirements, and professional practice. Any comments would be resolved before the report is presented to the City.

It is expected that the shear wave velocity results will confirm that the dam is founded on moderately to fresh, tight, jointed impervious bedrock (Henny, 1930 and GEI, 2021). The proposed field program is fundamentally different than recent work completed at the site by GEI in that GEI was focused on measuring compression (P-waves) of the rock which are important for evaluating the depth to top of rock and relative strength of the rock. The geophysical work in the proposed seismic hazard work focuses on measuring shear (S-waves) of the rock, which are more relevant for seismic analyses.

TASK 3 - HYDRAULIC LOADING & CONSEQUENCES

In order to properly estimate risk for PFMs during the L2RA, hydraulic loading must be quantified for a number of return periods. In addition, the consequences of dam breach, in terms of potential life loss, must be quantified. Although it is sometimes necessary to evaluate the consequences of dam breach in terms of economic loss or environmental degradation, we do not believe that this level of detail is warranted for the L2RA component of the comprehensive assessment.

Task 3A - Consequences of Dam Failure

The City has some data available in the STID to serve as the basis for estimating life loss consequences that could result from a dam breach. Available data regarding dam failure and non-failure scenario inundation will be compiled and arranged to facilitate the estimate. This is anticipated to include existing dam breach inundation studies and mapping as well as FEMA floodplain mapping. Additionally, available information regarding structures and the population at risk will be compiled. We propose to establish the basis for life loss estimates using existing inundation studies. No site visits or detailed catalog of downstream structures are proposed as part of this effort.



Estimate of Population at Risk

Structures and other frequently populated areas within the dam breach inundation area will be identified, and generalized population at risk per structure or hazard area will be assigned to calculate the estimated population at risk. Population at risk will be estimated for the following three scenarios: 1) Fair Weather Failure, 2) Flood Failure, and 3) Flood Non-Failure.

The inundation maps in the STID are dated but should provide enough information to develop population at risk for both the fair-weather failure and flood failure scenarios. The existing maps do not provide inundation extents for the non-failure flood scenario. Estimates of population at risk for the non-failure flood scenario will be developed based on either the FEMA floodplain maps or from non-failure scenario tabular data as documented in the Emergency Action Plan.

Estimate of Potential Life Loss

Potential loss of life will be estimated for the following three scenarios: 1) Fair Weather Failure, 2) Flood Failure, and 3) Flood Non-Failure. A range of loss of life for each scenario will be estimated using the Bureau of Reclamation's Consequence Estimating Methodology (RCEM). Up to five regions for flood lethality analysis will be selected within the downstream flood plain for each scenario using engineering judgment based on warning time, population at risk, and similarity of flood severity. Fatality rates from RCEM will be applied uniformly to all population at risk within each region to develop total loss of life estimates for each scenario.

The estimated life loss consequences would be summarized in a technical memorandum that documents the population at risk, life loss estimates, and assumptions applied within the consequence analysis. A draft of the technical memorandum would be provided for City review. The memorandum would be finalized after receiving the City's comments. Considering the timeline for this work, we have not budgeted to address FERC comments on the technical memorandum.

Task 3B - Hydrologic Loading

The current STID includes a recent discharge frequency curve from the 2016 PFMA by AECOM that provides hydrologic and reservoir stage frequency estimates. It is anticipated that this information will be adequate to support the L2RA for Hosler Dam. In order to confirm the frequency curve is implemented properly in the L2RA, we will perform a detailed review of available hydrologic information for the Hosler Dam watershed. This includes information from USGS stream gages, USGS regression methodologies, and the STID and other supporting technical information for the dam. If available, it would be beneficial to review the documentation from the 2016 AECOM study to support this effort.

A brief summary of available information relating to reservoir stage and hydrologic frequency analyses will be prepared to support the L2RA. The objective of the summary is to provide a read-ahead package for those participating in the L2RA in a format that is conducive to estimating probability of dam failure at various return periods.



TASK 4 – SYSTEM RESPONSE

The STID contains selected analyses related to the stability of the dam under different hydrologic and seismic loadings. Many of these will be helpful in estimating the annual probability of failure during the L2RA. We propose to leverage these existing analyses and to perform additional, simplified stability modeling to estimate the response of the dam at return periods not covered by the existing analyses. The objective of completing this work ahead of the L2RA is to identify critical load levels that are important to estimating probability of failure.

The results of the system response analyses would be summarized in technical memorandum. The primary objective of the memo would be to serve as a read-ahead package for participants in the L2RA session. The tech memo would also be included as an appendix to the comprehensive assessment report to document the review of existing analyses. For budgeting purposes, we have estimated that approximately 160 hours for Gannett Fleming’s structural engineer and 8 hours of Cornforth’s geotechnical engineer would be sufficient to characterize the response of the structure for the hydrologic and seismic loading return periods used in Tasks 1 and 3.

TASK 5 - PM, COORDINATION AND MEETINGS

Effort necessary to manage overall project activities, balance staffing resources, and prepare budget and status updates would be included in Task 5. Effort to coordinate access to the site for geophysical testing would also be tracked with this task.

SCHEDULE AND ESTIMATED COST

Our estimated costs to complete the tasks outlined above is a Not-to-Exceed sum of \$232,500. The total amount would not be exceeded without your prior approval. A breakdown of the costs is provided below. We are prepared to begin work immediately upon receiving Notice-to-Proceed from the City, and estimate that we could complete the scope of work by the end of February 2023. We have assumed that this work would be performed under the terms and conditions of our existing contract for Project #2018-15 dated June 6, 2018.

Task	Labor	Subconsultant	Total
Task 1 – Seismic Hazard Analysis	\$6,000	\$103,500	\$109,500
Task 2 – Geophysical Survey		\$31,500	\$31,500
Task 3 – Hydraulic Loading/Consequences	\$2,500	\$27,500	\$30,000
Task 4 – Structure System Response Curve	\$2,000	\$52,500	\$54,500
Task 5 – PM, Coordination, Meetings	\$7,000		\$7,000
Not-to-Exceed Total:			\$232,500



CLOSING

We appreciate the opportunity to assist the City with this challenging project. If you have any questions related to the proposed scope of work, please call us at (503) 452-1100.

Sincerely,

CORNFORTH CONSULTANTS, INC.

Gerry M. Heslin
Vice President