

**PROFESSIONAL SERVICES AGREEMENT  
FOR  
BIORETENTION HYDRAULIC PERFORMANCE STUDY SERVICES**

This Professional Services Agreement ("Agreement") is effective as of the date of the last authorizing signature below (which is the "effective date"). The parties ("Parties") to this Agreement are the City of Olympia, a Washington municipal corporation ("City"), and Associated Earth Sciences, Inc., (AESI), a Washington corporation ("Consultant").

A. The City seeks the temporary professional services of a skilled independent consultant capable of working without direct supervision, in the capacity of conducting the third and final phase of a Bioretention Hydraulic Performance Study (BHPS); and

B. Consultant has the requisite skill and experience necessary to provide such services.

NOW, THEREFORE, the Parties agree as follows:

1. Services.

Consultant shall provide the services more specifically described in Exhibit "A," attached hereto and incorporated by this reference ("Services"), in a manner consistent with the accepted practices for other similar services, and when and as specified by the City's representative.

2. Term.

The term of this Agreement commences on the effective date and continues until the completion of the Services, but in any event no later than August 31, 2025 ("Term"). This Agreement may be extended for additional periods of time upon the mutual written agreement of the City and the Consultant.

3. Termination.

Prior to the expiration of the Term, this Agreement may be terminated immediately, with or without cause by the City.

4. Compensation.

A. Total Compensation. In consideration of the Consultant performing the Services, the City shall pay the Consultant an amount not to exceed Six Hundred Fourteen Thousand One Hundred Fifty Nine and No/100 Dollars (\$614,159.00) calculated on the basis of the hourly labor charge rate schedule for Consultant's personnel attached hereto as Exhibit "B";

B. Method of Payment. Payment by the City for the Services will only be made after the Services have been performed, an invoice is submitted in the form specified by the City, which invoice must specifically describe the Services performed, the name of Consultant's personnel performing such Services, the hourly labor charge rate for such personnel, and the invoice is approved by the designated

City representative. The City will make payment on a monthly basis, within thirty (30) days after receipt of an invoice.

C. Consultant Responsible for Taxes. The Consultant is solely responsible for the payment of, and shall pay, any taxes imposed by any lawful jurisdiction as a result of the performance and payment of this Agreement.

5. Contract Managers.

All formal communications about this Agreement, contract deliverables, accomplishments, regulatory oversight, invoicing, and requests for amendment must be coordinated directly between the Consultant and City's Contract Manager unless otherwise approved in writing by the City. The contract managers are:

**Consultant**

Jennifer H. Saltonstall, L.G., L. Hg.  
Principal Hydrologist, Geologist  
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[jsaltonstall@aesgeo.com](mailto:jsaltonstall@aesgeo.com)  
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**City of Olympia**

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Olympia, WA 98507-1967  
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6. Compliance with Laws.

Consultant shall comply with and perform the Services in accordance with all applicable federal, state, and City laws including all City codes, ordinances, resolutions, standards, and policies, as existing on the effective date or thereafter adopted or amended.

7. Assurances.

Consultant affirms that it has the requisite training, skill, and experience necessary to provide the Services and is appropriately accredited and licensed by all applicable agencies and governmental entities, including being registered to do business in the City of Olympia by obtaining a City of Olympia business registration.

8. Independent Contractor/Conflict of Interest.

It is the intention and understanding of the Parties that Consultant is an independent contractor and that the City is neither liable nor obligated to pay Consultant sick leave, vacation pay, or any other benefit of employment, nor to pay any social security or other tax which may arise as an incident of employment. Consultant shall pay all income and other taxes due. Industrial or any other insurance

that is purchased for the benefit of the City, regardless of whether such may provide a secondary or incidental benefit to Consultant, may not be deemed to convert this Agreement to an employment contract. It is recognized that Consultant may be performing professional services during the Term for other parties; provided, however, that such performance of other services may not conflict with or interfere with Consultant's ability to perform the Services. Consultant shall resolve any such conflicts of interest in favor of the City.

9. Equal Opportunity Employer.

A. In all Consultant services, programs, and activities, and all Consultant hiring and employment made possible by or resulting from this Agreement, Consultant, and Consultant's employees, agents, subcontractors, and representatives shall not unlawfully discriminate against any person based on any legally protected class status including but not limited to: sex, age (except minimum age and retirement provisions), race, color, religion, creed, national origin, marital status, veteran status, sexual orientation, gender identity, genetic information, or the presence of any disability, including sensory, mental, or physical disabilities; provided, however, that the prohibition against discrimination in employment because of disability does not apply if the particular disability prevents the performance of the essential functions required of the position.

This requirement applies, but is not limited, to the following: employment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. Consultant shall not violate any of the terms of Chapter 49.60 RCW, Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act, Section 504 of the Rehabilitation Act of 1973, or any other applicable federal, state, or local law or regulation regarding nondiscrimination. Any material violation of this provision is grounds for termination of this Agreement by the City and, in the case of Consultant's breach, may result in ineligibility for further City agreements.

B. In the event of Consultant's noncompliance or refusal to comply with the above nondiscrimination requirement, this Agreement may be rescinded, canceled, or terminated in whole or in part, and Consultant may be declared ineligible for further agreements or contracts with the City. The City shall, however, give Consultant a reasonable time in which to correct this noncompliance.

C. To assist the City in determining compliance with the foregoing nondiscrimination requirements, Consultant shall complete and return the *Statement of Compliance with Nondiscrimination* attached as **Exhibit C**.

10. Confidentiality.

Consultant shall not to disclose any information or documentation obtained by Consultant in performance of this Agreement that has been expressly declared confidential by the City. Breach of confidentiality by Consultant is grounds for immediate termination.

11. Indemnification/Insurance.

A. Indemnification / Hold Harmless. Consultant shall defend, indemnify, and hold the City, its officers, officials, employees, and volunteers harmless from any and all claims, injuries, damages, losses, or suits including attorney fees, arising out of or resulting from the acts, errors, or omissions of

Consultant in performance of this Agreement, except for injuries and damages caused by the sole negligence of the City.

Should a court of competent jurisdiction determine that this Agreement is subject to RCW 4.24.115, then, in the event of liability for damages arising out of bodily injury to persons or damages to property caused by or resulting from the concurrent negligence of Consultant and the City, its officers, officials, employees, and volunteers, Consultant's liability hereunder is only to the extent of Consultant's negligence. It is further specifically and expressly understood that the indemnification provided herein constitutes the Consultant's waiver of immunity under Industrial Insurance, Title 51 RCW, solely for the purposes of this indemnification. This waiver has been mutually negotiated by the parties. The provisions of this section survive the expiration or termination of this Agreement.

B. Insurance Term. Consultant shall procure and maintain for the duration of the Agreement insurance against claims for injuries to persons or damage to property that may arise from or in connection with the performance of the work hereunder by Consultant, its agents, representatives, or employees.

C. No Limitation. Consultant's maintenance of insurance as required by this Agreement may not be construed to limit the liability of Consultant to the coverage provided by such insurance, or otherwise limit the City's recourse to any remedy available at law or in equity.

D. Minimum Scope of Insurance. Consultant shall obtain insurance of the types described below:

1. Automobile Liability insurance covering all owned, non-owned, hired, and leased vehicles. Coverage must be at least as broad as ISO occurrence form (ISO) form CA 00 01 or a substitute form providing equivalent liability coverage.

2. Commercial General Liability insurance must be at least as broad as ISO occurrence form CG 00 01 and must cover liability arising from premises, operations, independent contractors, stop gap liability, personal injury, and advertising injury. The City must be named as an additional insured under Consultant's Commercial General Liability insurance policy with respect to the work performed for the City using an additional insured endorsement at least as broad as ISO CG 20 26.

3. Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington.

4. Professional Liability insurance appropriate to Consultant's profession.

E. Minimum Amounts of Insurance. Consultant shall maintain the following insurance limits:

1. Automobile Liability insurance with a minimum combined single limit for bodily injury and property damage of \$1,000,000 per accident.

2. Commercial General Liability insurance must be written with limits no less than \$2,000,000 each occurrence and \$2,000,000 general aggregate.

3. Professional Liability insurance must be written with limits no less than \$1,000,000 per claim and \$1,000,000 policy aggregate limit.

F. Other Insurance Provisions. Consultant's Automobile Liability and Commercial General Liability insurance policies are to contain, or be endorsed to contain, that they are primary insurance as respect the City. Any Insurance, self-insurance, or insurance pool coverage maintained by the City must be excess of Consultant's insurance and do not contribute with it.

G. Acceptability of Insurers. Insurance is to be placed with insurers with a current A.M. Best rating of not less than A:VII.

H. Verification of Coverage. Consultant shall furnish the City with original certificates and a copy of the amendatory endorsements, including the additional insured endorsement, evidencing the insurance requirements of Consultant before commencement of the work.

I. Notice of Cancellation. Consultant shall provide the City with written notice of any policy cancellation, within two business days of its receipt of such notice.

J. Failure to Maintain Insurance. Failure on the part of Consultant to maintain the insurance as required constitutes a material breach of contract, upon which the City may, after giving five business days' notice to Consultant to correct the breach, immediately terminate the Agreement or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the City on demand, or at the sole discretion of the City, offset against funds due Consultant from the City.

K. City's Full Access to Consultant Limits. If Consultant maintains higher insurance limits than the minimums shown above, the City is insured for the full available limits of Commercial General and Excess or Umbrella liability maintained by Consultant, irrespective of whether such limits maintained by Consultant are greater than those required by this Agreement or any certificate of insurance furnished to the City evidences limits of liability lower than those maintained by Consultant.

## 12. Work Product.

Any deliverables identified in the Scope of Work or otherwise identified in writing by the City that are produced by Consultant in performing the Services under this Agreement and which are delivered to the City belong to the City. Consultant shall deliver any such work product to the City at the termination or cancellation date of this Agreement, or as soon thereafter as possible. All other documents are owned by Consultant.

## 13. Books and Records.

Consultant shall maintain books, records, and documents which sufficiently and properly reflect all direct and indirect costs related to the performance of the Services and maintain such accounting procedures and practices as may be deemed necessary by the City to assure proper accounting of all funds paid pursuant to this Agreement. These records are subject, at all reasonable times, to inspection, review, or audit by the City, its authorized representative, the State Auditor, or other governmental officials authorized by law to monitor this Agreement.

A record owned, used, or retained by the City is a “public record” pursuant to RCW 42.56.010 and is subject to disclosure upon request under Washington’s Public Records Act, even if such record is in Consultant’s sole possession. Should the City request that Consultant provide the City with a record that the City, in its sole discretion, deems to be a public record, so that it may be produced in response to a public records request, and should Consultant fail to provide such record to the City within 10 days of the City’s request for such record, Consultant shall indemnify, defend, and hold the City harmless for any public records judgment, including costs and attorney’s fees, against the City involving such withheld record.

14. Non-Appropriation of Funds.

If sufficient funds are not appropriated or allocated for payment under this Agreement for any future fiscal period, the City is not obligated to continue the Agreement after the end of the current fiscal period, and this Agreement automatically terminates upon the completion of all remaining Services for which funds are allocated. No penalty or expense accrues to the City in the event this provision applies.

15. General Provisions.

A. Entire Agreement. This Agreement contains all of the agreements of the Parties with respect to any matter covered or mentioned in this Agreement and no prior agreements are effective for any purpose.

B. Modification. No provision of this Agreement, including this provision, may be amended or modified except by written agreement signed by the Parties.

C. Full Force and Effect; Severability. Any provision of this Agreement that is declared invalid or illegal in no way affects or invalidates any other provision hereof and such other provisions remain in full force and effect. Further, if it should appear that any provision hereof is in conflict with any statutory provision of the State of Washington, the provision that appears to conflict therewith must be deemed inoperative and null and void insofar as it may be in conflict therewith, and must be deemed modified to conform to such statutory provision.

D. Assignment. Neither Consultant nor the City may transfer or assign, in whole or in part, any or all of its obligations and rights under this Agreement without the prior written consent of the other Party.

1. If Consultant desires to assign this Agreement or subcontract any of its work hereunder, Consultant shall submit a written request to the City for approval not less than 15 days prior to the commencement date of any proposed assignment or subcontract.

2. Any work or services assigned or subcontracted for hereunder is subject to each provision of this Agreement.

3. Any technical/professional service subcontract not listed in this Agreement, which is to be charged to this Agreement, must have prior written approval by the City.

4. The City reserves the right to inspect any assignment or subcontract document.

E. Successors in Interest. Subject to the foregoing Subsection, the rights and obligations of the Parties inure to the benefit of and be binding upon their respective successors in interest, heirs, and assigns.

F. Attorney Fees. In the event either of the Parties defaults on the performance of any term of this Agreement or either Party places the enforcement of this Agreement in the hands of an attorney, or files a lawsuit, the prevailing party is entitled to its reasonable attorneys' fees, costs, and expenses to be paid by the other Party.

G. No Waiver. Failure or delay of the City to declare any breach or default immediately upon occurrence does not waive such breach or default. Failure of the City to declare one breach or default does not act as a waiver of the City's right to declare another breach or default.

H. Governing Law. This Agreement is governed by and must be interpreted in accordance with the laws of the State of Washington.

I. Authority. Each individual executing this Agreement on behalf of the City and Consultant represents and warrants that such individual is duly authorized to execute and deliver this Agreement on behalf of Consultant or the City.

J. Notices. Each party shall deliver any notice required to be given at the addresses set forth above. Any notices may be delivered personally to the addressee of the notice or may be deposited in the United States mail, postage prepaid, to the address set forth below. Any notice so posted in the United States mail must be deemed received three days after the date of mailing.

K. Captions. The respective captions of the Sections of this Agreement are inserted for convenience of reference only and may not be deemed to modify or otherwise affect any of the provisions of this Agreement.

L. Performance. Time is of the essence in performance of this Agreement and each and all of its provisions in which performance is a factor. Adherence to completion dates set forth in the description of the Services is essential to Consultant's performance of this Agreement.

M. Remedies Cumulative. Any remedies provided for under the terms of this Agreement are not intended to be exclusive, but are cumulative with all other remedies available to the City at law, in equity, or by statute.

N. Counterparts. This Agreement may be executed in a number of identical counterparts which, taken together, constitute collectively one Agreement; but in making proof of this Agreement, it is not necessary to produce or account for more than one such counterpart. Additionally, (i) the signature pages taken from separate individually executed counterparts of this Agreement may be combined to form multiple fully executed counterparts; and (ii) a facsimile signature or an electronically scanned signature, or an electronic or digital signature where permitted by law, must be deemed to be an original signature for all purposes. All executed counterparts of this Agreement are originals, but all such counterparts, when taken together, constitute one and the same Agreement.

O. Equal Opportunity to Draft. The parties have participated and had an equal opportunity to participate in the drafting of this Agreement, and the Exhibits, if any, attached. No ambiguity may be construed against any party upon a claim that that party drafted the ambiguous language.

P. Venue. All lawsuits or other legal actions whatsoever with regard to this agreement must be brought and maintained only in Thurston County, Washington, state Superior Court.

Q. Ratification. Any work performed prior to the effective date that falls within the scope of this Agreement and is consistent with its terms is hereby ratified and confirmed.

R. Certification Regarding Debarment, Suspension, and Other Responsibility Matters.

1. By signing the agreement below, Consultant certifies to the best of its knowledge and belief, that it and its principles:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or agency;

b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission or fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction; violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in paragraph 1.b. of this certification; and

d. Have not within a three-year period preceding signing this Agreement had one or more public transactions (federal, state, or local) terminated for cause or default.

2. Where Consultant is unable to certify to any of the statements in this certification, Consultant shall attach an explanation to this proposal.

S. Early Retirement from the State of Washington- Certification. By signing this form, Consultant certifies that no one being directly compensated for their services pursuant to this Agreement has retired from the Washington State Retirement System using the 2008 Early Retirement Factors with restrictions on returning to work.

\*\*\* Signature page to follow \*\*\*



**CITY OF OLYMPIA**

By: \_\_\_\_\_

Steven J. Burney

P.O. Box 1967

Olympia WA 98507-1967

Date of Signature: \_\_\_\_\_

APPROVED AS TO FORM:

*Michael M. Young* \_\_\_\_\_

Deputy City Attorney

**I certify that I am authorized to execute this Agreement on behalf of the Consultant.**

**ASSOCIATED EARTH SCIENCES, INC. (AESI):**

By: *Jennifer H. Saltonstall* \_\_\_\_\_

Jennifer H. Saltonstall, L.G, L. Hg.

Vice President, Principal Hydrogeologist

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Kirkland, WA 98033

425.827.9901

[jsaltonstall@aesgeo.com](mailto:jsaltonstall@aesgeo.com)

## *Detailed Scope of Work*

### *Evaluation of the long-term bioretention soil infiltration rate related to vegetation, maintenance, soil media and geotechnical site parameters*

### *LOI #13*

Project Team Includes:

Lead:

Name: Jennifer H. Saltonstall, L.Hg.  
Organization(s): Associated Earth Sciences, Inc.  
Phone: 425-827-7701  
Email: [jsaltonstall@aesgeo.com](mailto:jsaltonstall@aesgeo.com)

Team Members:

Name(s): Bill Taylor and Anne Cline  
Organization: Raedeke Associates, Inc.  
Phone(s): 206-525-8122  
Email(s): [btaylor@raedeke.com](mailto:btaylor@raedeke.com); [acline@raedeke.com](mailto:acline@raedeke.com);

Name: Doug Beyerlein, P.E.  
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Municipal Partner: Eric Christensen, City of Olympia, Water Resources Director – Public Works  
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Revised August 25, 2020

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## *Detailed Scope of Work*

### *Evaluation of the long-term bioretention soil infiltration rate related to vegetation, maintenance, soil media and geotechnical site parameters*

#### **1.0 PROJECT PURPOSE**

This study is about bioretention lifespans and the intent is to conduct a point-in-time checkup on up to 50 older (10 years or older) bioretention facilities, and then communicate the long-range bioretention effectiveness to a broad base of NPDES jurisdictions. The results would be based on measuring on how well bioretention continues to perform (especially infiltration rate) and identifying what site characteristics are common for well performing or under-performing systems. It is not a study of hydrologic model parameters, continuous hydrologic performance, or water quality/chemistry.

This study will provide a controlled field study of infiltration rate and related site conditions to evaluate maintenance thresholds (Topic 16) for bioretention facilities and provide key performance information on stormwater control measures (Topic 11).

During the information gathering phase for the intensive bioretention hydrologic performance (BHP) phase I study, we heard anecdotal concerns from jurisdictions and designers about bioretention lifespan, particularly due to the possibility of (1) clogging of the systems over time, and (2) soil compaction, both of which can result in an overall reduction in permeability. Slow-draining facilities can also cause problems of stagnant water and aesthetic problems, leading to difficulties in acceptance of bioretention as a drainage or stormwater solution.

There are many facilities that are over 10-years-old and some in excess of 20-years-old. Performance and condition measurements after a decade or more of performance will provide valuable lifespan information. The objectives of this study are to:

- Assess bioretention lifespans and address practical questions about how quickly different sites age through facility infiltration rates, soil composition, vegetation and maintenance practices.
- Conduct a point-in-time checkup on up to 50 older (10 years or older) bioretention facilities. The key field data collected will be:
  - Field infiltration rates using standardized, repeatable procedures;
  - Overall condition including evidence of inlet efficiency, erosion, deposition, clogging, debris accumulation and overflow;
  - Geotechnical data including bioretention media thickness and composition (grain size, organic content); mulch layer presence, extent, and thickness; relative soil compaction; and subsurface geologic and groundwater conditions using hand-augered boreholes.

- Vegetation community data including vegetation composition and structure, stem density of woody plants, and estimating the percent basal cover of herbaceous plants using quadrats;
  - Maintenance practices and frequency through interviews with maintenance personnel or managers; and
  - Site and facility design information including estimated drainage basin area, impervious acreage, facility design specifics (age, BSM surface area, inlets, underdrains, outlets, ponding depth, assumed design rate).
- Communicate the long-range bioretention effectiveness to a broad base of NPDES jurisdictions. Information on infiltration rates, design, age, vegetation conditions, maintenance practices and geotechnical data can provide baseline information for better understanding of bioretention lifespans and considerations for benefit ratio and equivalent area when assessing stormwater impacts to our receiving waters.
- Gather a large dataset on different systems to understand the possible influence of the above factors on performance.
- Bioretention site documentation done in this proposed study can be used as a baseline for a potential follow-up study in another ten years (or so) to see how the sites continue to age over time.
- Provide guidance from an engineering perspective on what lessons we can learn studying these older sites; what are the critical factors to prevent bioretention site performance failure in future designs; and build confidence in the longevity of properly designed/constructed bioretention systems.

Previous field assessment of installed facilities (SAM Bioretention Hydrologic Performance [BHP] Studies I and II) demonstrated variability in infiltration rates, plant community (type, density), bioretention media composition, and soil compaction between facilities. However, these previous assessments generally did not assess the longevity of the hydrologic performance of the sites or how sites change over time.

We propose to leverage the BHP Phase I and II outreach, experience and information gained from the site assessment and monitoring efforts to identify older facilities and conduct a streamlined assessment without conducting the intensive wet-season continuous flow monitoring or modeling of the past projects.

## **2.0 PROJECT DESCRIPTION/SCOPE OF WORK**

### **2.1 Study design and main project tasks**

The project will measure field infiltration rate and compare hydrologic performance of constructed bioretention facilities across age classes, basic design types (with and without underdrains), and ratio of impervious area to bioretention area. Using this comparison, and drawing from additional site data such as vegetation density and composition, local surficial

geology, presence of shallow groundwater or hydraulically restrictive layers, actual constructed site conditions, working hypotheses will be proposed for factors leading to the long term performance of older facilities.

There are fundamental reasons for demonstrating the long-term hydrologic performance of bioretention facilities. If the protection of receiving water habitat is based on instream hydrologic goals in a basin utilizing Low Impact Development (LID), the performance of the individual facilities must meet expectations to ensure success of the combined hydrologic response of all the facilities.

Overall, accurate hydrologic performance of bioretention facilities must first be met before other related performance goals (protection of downstream receiving waters, pollutant removal) can be fully realized. This research will: provide data to support confidence in long-term performance; provide feedback on Stormwater Management Manual for Western Washington (SWMMWW) bioretention design; correlate the drainage rates to the vegetation type and density in the cell to help steer planting plans to assist in the longevity of the cells; and suggest maintenance recommendations for jurisdictions to help maintain the hydrologic performance of their facilities.

Communication of the findings will be conducted through presentations to the Stormwater Work Group and County-based presentations for the benefit of both County and City permittee audiences.

It is unclear how many older bioretention facilities (pre-2005) will be discovered, however, discovering the extent of these facilities will be a valuable outcome of this proposal. There were many facilities in the 2005 to 2010 time frame reviewed during BHP Phase I that were not selected for monitoring due to dispersed inflow or other features which would impede monitoring. Because inflow/overflow monitoring will not be included as part of this study, those facilities may be suitable for inclusion in this study. Considerable effort will be brought to identifying appropriate facilities. Sources for site identification will include expanded outreach to NPDES jurisdictions, school districts (early adopters of bioretention), and outreach to the hundreds of engineers trained in the model by Mr. Beyerlein. We fully expect a wide range of candidate facilities from throughout the Puget Sound Basin. We also expect the outreach and communication plan to result in improved participation with smaller jurisdictions, including efforts to present findings to smaller jurisdictions.

### **Task 1. Project Management**

This task includes project management and will be performed by the municipal project manager (Olympia) and subcontractor (Associated Earth Sciences, Inc.). This task includes completing a contract with the subcontractor, subcontract management, quarterly progress reporting, budget management, team meetings, staff management, coordination with the technical advisory

committee (TAC), and communications with the Ecology SAM Coordinator. Associated Earth Sciences, Inc. (Jennifer Saltonstall) will conduct project management to support Tasks 2 to 5, including coordinating with subcontractor consultants Clear Creek Solutions (Doug Beyerlein), Raedeke Associates, Inc. (Bill Taylor and Anne Cline), budget management, and deliverable schedule.

### Subtasks

- 1.1 Prepare consultant contract scopes and contracting.** This task will involve conducting the process to procure and manage consultant services for the project.
- 1.2 Prepare quarterly progress reports.** This task will involve completing reporting responsibilities to Ecology.
- 1.3 Coordinate communication with Ecology and partner jurisdictions and consultants.** This task is to communicate with jurisdictions and consultants related to administration of the contract.

**Deliverable 1.1:** Document contracting, coordination with team, and communications via quarterly progress reports by the City of Olympia with consultant support.

## Task 2: Study Design Communication, QAPP Update and Site Selection

This task will also include activities related to either designating a Project Liaison or creation of Technical Advisory Committee (TAC), refining the study design details, updates to the QAPP and site selection.

An initial planning meeting with the Ecology SAM Coordinator and the Ecology-designees will cover project design details, including specific study parameters and data collection criteria, roles and responsibilities of team members, and logistics for site assessment. Discussions at the initial planning meeting will determine if a Project Liaison or Technical Advisory Committee is warranted. A follow-up meeting will be held with the Project Liaison or Technical Advisory Committee, Ecology or Ecology-designees, the coordinating municipality and team members to refine study design prior to finalization of the QAPP and site selection. The QAPP will rely on the QAPP developed for the Bioretention Hydrologic Performance (BHP) studies, will be prepared following Ecology guidelines, and will include details of the study design, sampling and analysis methods and quality assurance and quality control procedures. The QAPP will be submitted to Ecology prior to Task 3 Field Site Assessment activities.

A large part of site selection includes using the facilities and site contacts developed as part of the BHP Phase I and II studies and the State water quality stormwater grants. Many facilities previously reviewed were not selected for inclusion in the BHP studies but could more easily qualify for the current study. Site contacts will be reviewed, updated and then we will contact municipal stormwater managers, the Stormwater Center, school facility managers (many schools were early adopters of bioretention) and other consultants for additional candidate sites.

## Subtasks

- 2.1 Planning meetings and Project Liaison or TAC.** This task include two key meetings, (1) a kick-off meeting with applicable Stormwater Work Group members, Ecology staff and City of Olympia staff to discuss study design details, and designate either a Project Liaison and/or TAC, and (2) a follow-up meeting with either with Project Liaison and/or Technical Advisory Committee.
- 2.2 Update Quality Assurance Project Plan (QAPP).** This task includes modifications to the QAPP developed for the BHP studies. The revised QAPP will follow Ecology's *Guidelines and Specifications for Preparing Quality Assurance Project Plans for Environmental Studies*, February 2001 (Ecology Publication No. 01-03-003 and be submitted to the Department of Ecology with time for revision, comment, and approval.
- 2.3 Develop site selection criteria checklist.** This task will be to create a site selection criteria checklist in coordination with Ecology staff, consultants, and participating jurisdiction partners. The checklist will be a modification of the BHP checklists.
- 2.4 Communicate selection criteria to partners; receive and organize candidate sites; visit sites.** This task will involve communicating with the individual partners submitting candidate sites; collecting and evaluating background engineering and construction data; visiting candidate sites to conduct the on-site selection checklist, scoring the complete list of candidate sites and making selections of sites to be monitored. Nominal goals are to identify up to 100 candidate sites and select up to 50 sites for site assessment.
- 2.5 Summary technical memo.** Write technical memo on the site selection process and results including sections on: site selection criteria, candidate sites, site visit checklist results, scoring results, and proposed list of sites to be assessed.

**Deliverable 2.1:** Summary of study kick-off meeting and follow-up meeting with Project Liaison and/or Technical Advisory Committee. Deliverable will include summary meeting notes.

**Deliverable 2.2:** Draft QAPP for all sites addressing site assessment/monitoring methods and analysis delivered to Ecology.

**Deliverable 2.3:** Respond to Ecology's and other technical reviewers' comments and finalize QAPP. Final QAPP to be delivered to Ecology.

**Deliverable 2.4:** Site selection criteria checklist submitted to Ecology.

**Deliverable 2.5:** Technical memorandum on the site selection process, summary of results of site evaluation and list of final sites submitted to Ecology.

## Task 3: Field Assessment, Data Collection and Analysis

Based upon the QAPP, site assessment shall be conducted to provide the information necessary to meet the goals of this study. Bioretention performance is a function of many variables. Fundamental criteria affecting performance include the infiltration capacity of the imported bioretention soil media and any underdrain components, the infiltration capacity of the native



subgrade sediments, and the effects of shallow ground water inflow or mounding. Criteria that may affect bioretention longevity include vegetation composition and structure, maintenance practices, design features, and surrounding site use. Data collection will include but is not limited to:

- **Site and facility design information.** Review sites to identify fatal flaws in bioretention design/construction that prevent individual sites from performing as expected. Data reviewed will include drainage basin size, impervious acreage, facility design specifics (age, planned BSM surface area, inlets, underdrains, outlets, ponding depth, assumed design infiltration rate for BSM and subsurface geologic unit, if applicable). The design will be compared with overall facility condition including inlet efficiency and blockage; sidewall and base erosion type or patterns; sediment, organic matter, or trash deposition/coverage; clogging or debris accumulation; and ponding or overflow indicators.
- **Vegetation data information.** Vegetation composition and structure, stem density of woody plants, and estimating the percent basal cover of herbaceous plants using quadrats. Plants will not be identified to the genus and species within the cell but the overall plant palette will be noted within the cell and if the plants appear to be installed or volunteered from the surrounding landscape. Also, we will try to generalize the overall wetland indicator status of the plants present in the cell. The vegetation data will be analyzed with the infiltration rates to find if there is a correlation between vegetation type and the infiltration within the cells.
- **Maintenance Information.** Interviews will be conducted with maintenance personnel or managers on frequency and type of maintenance conducted and if the vegetation within the cell is maintained or the cell is only maintained for proper functioning, such as trash removal. Also we will note if the cell is irrigated. The type and frequency of maintenance will be correlated to the infiltration rates of the cells.
- **Shallow subgrade soil and groundwater information.** Representative samples of the bioretention soil media, underdrain aggregate (if applicable) and native subgrade sediments would be collected, classified in the field, and retained for additional testing as needed. A hand boring will be performed in the facility bottom and advanced to a depth of 8 to 10 feet or refusal. A detailed record of the observed subsurface soil, geology and ground water conditions will be made. The sediments will be described by visual and textural examination using the soil classification in general accordance with ASTM D2488, Standard Recommended Practice for Description of Soils. Hydrogeologic analysis and geologic unit assignment will be conducted to estimated infiltration capacity of the native subgrade sediments.
- **Field infiltration rates.** Large-scale in-situ infiltration measurements using either a controlled flood test or the Pilot Infiltration Test (PIT) is the preferred method for estimating the measured (initial) saturated hydraulic conductivity ( $K_{sat}$ ) of the soil profile beneath the bioretention facilities. The PIT is not a standard test but rather a practical field procedure recommended by Ecology. Temporary staff gauges will be installed to measure ponding depth. A controlled flood test will be performed in the footprint of each bioretention facility

with a 5-hour pre-soak and 1-hour constant head test per the guidelines for a Large-Scale Test as described by Ecology. If available source water flow is not sufficient to fully pond across the facility, the soaking time will be increased by 1-hour and the wetted area will be regularly measured throughout the testing period to identify when the pool stabilizes. Following the constant head portion of testing, the water will be shut off and falling head data will be collected.

- **Temporary wellpoints to monitor groundwater.** Shallow ground water conditions are an important site variable. Temporary well points will be installed to measure the subsurface water during infiltration testing. The well points will be equipped with dataloggers and then used to obtain information on response to infiltration testing. This data would be compared to staff gauge water level data within the facility.
- **Conduct geotechnical laboratory testing on bioretention and native subgrade soils.** The bioretention media and native subgrade sediments will be further classified using geotechnical laboratory testing procedures. The bioretention media will be tested for organic matter content using the Loss on Ignition test method (ASTM D2974) to estimate the percent organic matter, and the burned material will then be sieved using the Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis (ASTM D6913). The native subgrade sediments will be sieved in accordance with ASTM D6913 test procedures. Hydrometer analyses will only be conducted if the native material is composed of greater than 15 percent (by weight) silt/clay. Each site will have 3 sets of lab testing completed.

**Deliverable 3.1:** Hydrologic review and summarize hydrologic/engineering facility design parameters in a memo report. Identify the critical factors that prevent bioretention site performance failure in future designs.

**Deliverable 3.2:** Geotechnical and hydrogeologic field data collection and memo report on facility conditions with individual reports for each facility.

**Deliverable 3.3:** Vegetation and maintenance field data collection and summary memo report on vegetative composition of older cells and a correlation between the vegetation composition and drainage rates of older cells. Maintenance activities for the cells will also be summarized and analyzed to investigate if more frequent maintenance is associated with compacted bioretention soil.

#### **Task 4: Summary Analysis and Report**

This task consists of maintaining, managing, and utilizing data collected from the study to provide relevant information on the long-term hydrologic function of bioretention facilities. The final report will describe the study design, methods, and findings of the study. Analysis and discussion of the individual facilities will compare the performance of facilities in relation to measured variables. The information should be used to inform and support conclusions for the design and long-term hydrologic performance of bioretention facilities on a wide scale for Western

Washington. A draft report will be reviewed by City of Olympia and a final draft will be reviewed by Ecology. The final report will be submitted for approval by Ecology.

**Deliverable 4.1:** Meeting with Stormwater Work Group members, Ecology staff and City of Olympia staff to discuss results of site assessment, adequacy of data set and next steps for analysis.

**Deliverable 4.2:** Electronic Draft Final Report for review and comments by City of Olympia, Ecology, and Stormwater Work Group.

**Deliverable 4.3:** Meeting with Stormwater Work Group members, Ecology staff and City of Olympia staff to discuss Draft Report and provide feedback prior to final reporting.

**Deliverable 4.4:** Three printed copies of Final Report, one electronic version of Final Report plus all data files, reports and miscellaneous data relevant to the project.

## Task 5: Distribution of Findings

Communication of the findings will be conducted through a presentation to the Stormwater Work Group, preparation of a 2-page summary of the project findings for web publication and six presentations for the benefit of both County and City permittee audiences.

**Deliverable 5.1:** Presentation to the Stormwater Work Group.

**Deliverable 5.2:** Two-page summary of the project results/findings following the SAM Fact Sheet template.

**Deliverable 5.3:** Conduct six virtual presentations for Counties and City permittees. Venues could include local NPDES coordinator meetings, Phase I or Phase II permittee meetings, the APWA Stormwater Committee meetings, or other stormwater-related gatherings.

## 2.2 Communication plan

See Task 4, Deliverable 4.3, for an interim findings presentation to the SWG before the final report is completed.

See Task 5, Deliverable 5.2, for production of a two-page summary of the project results/findings and Task 5, Deliverable 5.3, discussing presentation of findings to the larger community.

### 3.0 PROJECT TEAM DESCRIPTION

See Task 2, Subtask 2.1, for discussion of Project Liaison or Technical Advisory Committee.

Project Team Includes:

Lead:

Name(s): Jennifer H. Saltonstall, L.Hg.  
Organization(s): Associated Earth Sciences, Inc.  
Phone(s): 425-827-7701  
Email(s): [jsaltonstall@aesgeo.com](mailto:jsaltonstall@aesgeo.com)

Team Members:

Name(s): Bill Taylor and Anne Cline  
Organization(s): Raedeke Associates, Inc.  
Phone(s): 206-525-8122  
Email(s): [btaylor@raedeke.com](mailto:btaylor@raedeke.com); [acline@raedeke.com](mailto:acline@raedeke.com);

Name(s): Doug Beyerlein, P.E.  
Organization(s): Clear Creek Solutions  
Phone(s): 425-225-5997  
Email(s): [beyerlein@clearcreeksolutions.com](mailto:beyerlein@clearcreeksolutions.com)

Municipal Partner: Eric Christensen, City of Olympia, Water Resources Director – Public Works  
Phone: 360-570-3741  
Email: [echriste@ci.olympia.wa.us](mailto:echriste@ci.olympia.wa.us)

### 4.0 PROJECT MANAGEMENT STRATEGY

See Task 1 for discussion of project management.

## 5.0 PROJECT BUDGET AND SCHEDULE

We have provided a time frame and budget based on our experience conducting similar assessments and surveys.

### 5.1 Project duration and requirements

Task 2 and Task 3 will require the largest amount of time to complete. The Task 2 schedule is driven in part by Ecology and review staff availability. We have provided a Task 2 duration of three months to allow sample time for communicating with the individual partners submitting candidate sites to gather the background information. The Task 3 schedule is based on selection of 50 bioretention cells. The site assessment time will include one full field day per site, and the schedule is based on an average two to three sites per week to allow for weather or other complications.

#### Approximate Schedule for Tasks

| Item   | Task Description                                    | Time Frame |
|--------|---|------------|
| Task 1 | Project management                                  | Throughout |
| Task 2 | Study Design Communication, QAPP and Site Selection | 3 months   |
| Task 3 | Field Assessment, Data Collection and Analysis      | 7 months   |
| Task 4 | Summary Analysis, Draft and Final Report            | 2 months   |
| Task 5 | Distribution of Findings                            | 3 months   |

### 5.2 Key project deliverables and cost

Total project costs for selecting and conducting field assessments of 50 bioretention sites are \$614,159. We have also broken out a per-site field assessment cost as suggested by the review committee for narrowing or expanding the scope of data collection. Key project deliverables are summarized in the following table for Task 1 to Task 5, with the deliverable lead identified. The designated “Lead Team Member” indicates point-of-contact and member responsible for the deliverable. However, all team members will participate in project meetings, site selection, QAPP and summary report. Detailed breakout of cost including hourly labor costs and other direct costs (travel, field supplies, water for testing or hydrant meter rental, and geotechnical laboratory testing) are included in the detailed budget attachment.

### Summary Costs, Table of Task Deliverables and Team Lead(s)

| Task and Key Deliverable Description                  |  | Lead Team Member(s)                       | 50 Sites Cost |
|---|--|---|---------------|
| Task 1 Project Management                             |  |   | \$22,380      |
| 1.1   | Prepare consultant scope and contract  | Eric Christensen,<br>Jennifer Saltonstall |               |
| 1.2   | Quarterly progress reports   |   |               |
| 1.3   | Coordinate communication w/ Ecology, partner jurisdictions and consultants                       |   |               |
| Task 2 Study Design, QAPP Update and Selection        |  |   | \$58,180      |
| 2.1   | Summary meeting notes for Kick-off Meeting and Follow up meeting with Project Liaison and/or TAC | Bill Taylor                               | 9,614         |
| 2.2   | Draft QAPP   |   | 2,908         |
| 2.3   | Comment Response and Final QAPP  |   | 921           |
| 2.4   | Communication, Site Selection and Checklist  |   | 39,789        |
| 2.5   | Site Selection Technical Memorandum  |   | 4,948         |
| Task 3 Field Assessment, Data Collection and Analysis |  |   | \$457,829     |
| 3.1   | Hydrologic Design Review Technical Memorandum  | Doug Beyerlein                            | 24,820        |
| 3.2   | Geotechnical Assessment and Facility Condition Technical Memorandum                              | Jennifer Saltonstall                      | 301,894       |
| 3.3   | Vegetation Assessment and Maintenance Survey Summary Technical Memorandum                        | Anne Cline                                | 131,115       |
| Task 4 Summary Analysis and Report                    |  |   | \$43,922      |
| 4.1   | SWG/Ecology meeting, summary notes to discuss initial results, adequacy, and analysis            | Bill Taylor                               | 4,408         |
| 4.2   | Electronic Draft Report  |   | 28,250        |
| 4.3   | Meeting and summary meeting notes for discussion of draft report prior to final report           |   | 8,564         |
| 4.4   | Final report   |   | 2,700         |
| Task 5 Distribution of Findings                       |  |   | \$13,869      |
| 5.1   | Stormwater Work Group Presentation   | Full team                                 | 9,400         |
| 5.2   | SAM Fact Sheet summary   | Bill Taylor                               | 656           |
| 5.3   | Six virtual presentations  | Full Team                                 | 3,813         |
| Summary of Cost                                       |  |   |               |
|   | Total Project Cost – Labor and ODC   |   | 596,180       |
|   | 3% Contingency   |   | 17,979        |
|   | Total Project Cost with 3% Contingency   |   | \$614,159     |
|   |  |   |               |
|   | Task 3 Per site cost – \$7,602 labor + \$1,554 ODC   |   | \$9,157       |

ODC = Other direct costs, which include mileage, cost of water supply for infiltration testing, geotechnical laboratory testing (sieves and organic matter content) and field supplies including temporary well point, staff gauge, mounting hardware, flow metering and datalogger equipment.

|  |   |  |  |  | Principal |           |             | Hydrologic Design |                              | Hydro/Geotechnical Assessment |         |                                 |            |       | Plant Community and Maintenance |    |                    |       |          |         |     |           |  |
|--|---|--|--|--|-----------|-----------|-------------|-------------------|------------------------------|-------------------------------|---------|---------------------------------|------------|-------|---------------------------------|----|--------------------|-------|----------|---------|-----|-----------|--|
| Long-Term Bioretention Study (LOI #13) |   |  |  |  |           | Olympia   |             |                   | Investigator                 | Clear Creek Soln              |         | Associated Earth Sciences, Inc. |            |       |                                 |    | Raedeke Associates |       |          |         |     |           |  |
|  | Detailed scope of work and budget   |  |  |  |           | PM        | Finan. Mngt | Lead              |                              | Consultant                    |         | Principal                       | Sr. Staff/ | Staff | WP                              |    | Senior             | Lead  | Field II | Field I |     | Labor     |  |
|  |   |  |  |  |           |           |             | \$164             |                              | \$200                         |         | \$205                           | \$110      | \$95  | \$60                            |    | \$222              | \$164 | \$116    | \$103   |     | Subtotal  |  |
| Task 1                                 | Project Management  |  |  |  |           |           |             |                   |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
| 1.1                                    | Prepare consultant scope and contract   |  |  |  |           |           |             |                   |                              |                               |         | 8                               |            |       |                                 |    |                    |       |          |         |     |           |  |
| 1.2                                    | Prepare quarerly progress reports (15 months, 5 reports)                      |  |  |  |           |           |             |                   |                              |                               |         | 50                              |            |       | 4                               |    |                    |       |          |         |     |           |  |
| 1.3                                    | Coordinate communication w/ Ecology and partner jurisdictions and consultants |  |  |  |           |           |             |                   |                              |                               |         | 50                              |            |       |                                 |    |                    |       |          |         |     |           |  |
| Task 1 subtotal                        |   |  |  |  |           |           |             |                   |                              |                               |         | \$22,380                        |            |       |                                 |    |                    |       |          |         |     | \$22,380  |  |
| Task 2                                 | Study Design, QAPP Update and Site Selection                                  |  |  |  |           |           |             |                   |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
| 2.1                                    | Planning meetings and Project Liaison or TAC, Summary Meeting Notes           |  |  |  |           |           |             | 18                |                              | 8                             |         | 18                              |            |       | 1                               |    |                    | 8     |          |         |     |           |  |
| 2.2                                    | Update Quality Assurance Project Plan (QAPP)                                  |  |  |  |           |           |             | 8                 |                              | 0                             |         | 4                               |            |       | 2                               |    |                    | 4     |          |         |     |           |  |
| 2.3                                    | Develop site selection criteria checklist                                     |  |  |  |           |           |             | 4                 |                              | 0                             |         | 1                               |            |       | 1                               |    |                    |       |          |         |     |           |  |
| 2.4                                    | Site selection communication; doc organization; visit sites                   |  |  |  |           |           |             | 155               |                              | 2                             |         | 20                              | 80         |       | 2                               |    |                    | 2     |          |         |     |           |  |
| 2.5                                    | Site selection summary TM   |  |  |  |           |           |             | 15                |                              | 2                             |         | 8                               |            |       | 2                               |    |                    | 2     |          |         |     |           |  |
| Task 2 subtotal                        |   |  |  |  |           |           |             | \$32,800          |                              | \$2,400                       |         | \$19,735                        |            |       |                                 |    | \$2,624            |       |          |         |     | \$57,559  |  |
| Task 3                                 | Field Assessment, Data Collection and Analysis                                |  |  |  |           |           |             |                   |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
| 3.1                                    | Hydrologic review and memo report   |  |  |  |           |           |             |                   |                              | 120                           |         | 4                               |            |       |                                 |    |                    |       |          |         |     |           |  |
| 3.2                                    | Geotech assessment and memo report  |  |  |  |           |           |             |                   |                              |                               |         | 105                             | 1175       | 800   | 10                              |    |                    |       |          |         |     |           |  |
|  | -site/regional soil/geo review, data sheet creation                           |  |  |  |           |           |             |                   |                              |                               |         | 10                              | 50         | 0     | 0                               |    |                    |       |          |         |     |           |  |
|  | -hydrant meter/water supply requests - 50 sites                               |  |  |  |           |           |             |                   |                              |                               |         | 10                              | 50         | 0     | 0                               |    |                    |       |          |         |     |           |  |
|  | -access/locate site visit, pick up hydrants/water supply parts                |  |  |  |           |           |             |                   |                              |                               |         | 10                              | 0          | 200   | 0                               |    |                    |       |          |         |     |           |  |
|  | -50-sites: infiltration test, geotech augers, wellpoints                      |  |  |  |           |           |             |                   |                              |                               |         | 25                              | 400        | 600   | 0                               |    |                    |       |          |         |     |           |  |
|  | -laboratory testing: grain size and organic matter testing                    |  |  |  |           |           |             |                   |                              |                               |         |                                 | 25         |       |                                 |    |                    |       |          |         |     |           |  |
|  | -Data analysis/report: test data, lab data reduction, compilation             |  |  |  |           |           |             |                   |                              |                               |         | 50                              | 400        |       |                                 |    |                    |       |          |         |     |           |  |
|  | -Site maps (3 per site) - USGS topo, aerial subbasin, facility aerial/sketch  |  |  |  |           |           |             |                   |                              |                               |         |                                 | 200        |       |                                 |    |                    |       |          |         |     |           |  |
|  | -Compile facility testing data, summary memo, composite tables                |  |  |  |           |           |             |                   |                              |                               |         |                                 | 50         |       | 10                              |    |                    |       |          |         |     |           |  |
| 3.3                                    | Vegetation assessment and maintenance survey memo report                      |  |  |  |           |           |             |                   |                              |                               |         | 4                               |            |       |                                 |    | 20                 | 300   | 500      | 150     |     |           |  |
|  | -Field  |  |  |  |           |           |             |                   |                              |                               |         |                                 |            |       |                                 |    | 0                  | 200   | 300      | 150     |     |           |  |
|  | -Report   |  |  |  |           |           |             |                   |                              |                               |         | 2                               |            |       |                                 |    | 20                 | 100   | 200      | 0       |     |           |  |
| Task 3 subtotal                        |   |  |  |  |           |           |             | \$0               |                              | \$24,000                      |         | \$229,015                       |            |       |                                 |    | \$127,090          |       |          |         |     | \$380,105 |  |
| Task 4                                 | Summary Analysis and Report   |  |  |  |           |           |             |                   |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
| 4.1                                    | SWG/TAC meeting and prep, Summary meeting notes                               |  |  |  |           |           |             | 8                 |                              | 4                             |         | 8                               |            |       |                                 |    |                    | 4     |          |         |     |           |  |
| 4.2                                    | Analysis and Draft report   |  |  |  |           |           |             | 104               |                              | 10                            |         | 18                              | 24         |       | 4                               |    |                    | 16    |          |         |     |           |  |
|  | -Format collected performance data for site comparison/ SWG meeting           |  |  |  |           |           |             | 8                 |                              | 6                             |         | 6                               | 24         |       |                                 |    |                    | 6     |          |         |     |           |  |
|  | -compare geotech data, veg data, maintenance data, design data                |  |  |  |           |           |             | 24                |                              |                               |         | 6                               |            |       |                                 |    |                    | 6     |          |         |     |           |  |
|  | -Identify result differences  |  |  |  |           |           |             | 16                |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
|  | -Produce summary comparisons  |  |  |  |           |           |             | 16                |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
|  | -draft report   |  |  |  |           |           |             | 40                |                              | 4                             |         | 6                               |            |       | 4                               |    |                    | 4     |          |         |     |           |  |
| 4.3                                    | Summary meeting notes, discuss draft, inc SWG/Ecology edits to draft report   |  |  |  |           |           |             | 24                |                              | 8                             |         | 12                              |            |       | 4                               |    |                    | 2     |          |         |     |           |  |
| 4.4                                    | Final Report  |  |  |  |           |           |             | 10                |                              |                               |         | 4                               |            |       | 4                               |    |                    |       |          |         |     |           |  |
| Task 4 subtotal                        |   |  |  |  |           |           |             | \$23,944          |                              | \$4,400                       |         | \$11,970                        |            |       |                                 |    | \$3,608            |       |          |         |     | \$43,922  |  |
| Task 5                                 | Distribution of Findings  |  |  |  |           |           |             |                   |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
| 5.1                                    | Prepare and Present Findings to the SWG                                       |  |  |  |           |           |             | 24                |                              | 6                             |         | 16                              |            |       |                                 |    |                    | 6     |          |         |     |           |  |
| 5.2                                    | Two-page summary for SAM Fact Sheet   |  |  |  |           |           |             | 4                 |                              |                               |         |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
| 5.3                                    | Virtual presentations - coordinate with 6 organizations                       |  |  |  |           |           |             | 12                |                              |                               |         | 9                               |            |       |                                 |    |                    |       |          |         |     |           |  |
| Task 5 subtotal                        |   |  |  |  |           |           |             | \$6,560           |                              | \$1,200                       |         | \$5,125                         |            |       |                                 |    | \$984              |       |          |         |     | \$13,869  |  |
|  | Total Hours   |  |  |  |           |           |             |                   | 386                          |                               | 160     |                                 | 339        | 1279  | 800                             | 34 |                    | 20    | 344      | 500     | 150 |           |  |
| total hours * rate                     |   |  |  |  |           |           |             | \$63,304          |                              | \$32,000                      |         | \$288,225                       |            |       |                                 |    | \$134,306          |       |          |         |     | \$517,835 |  |
|  | Total Labor   |  |  |  |           | \$517,835 |             |                   | Task 3 Per site cost - labor |                               | \$7,602 |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
|  | Total ODC's   |  |  |  |           | \$78,345  |             |                   | Task 3 Per site cost - ODC   |                               | \$1,554 |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |
| Grand Total                            |   |  |  |  |           | \$596,180 |             |                   | Task 3 Per site cost - total |                               | \$9,157 |                                 |            |       |                                 |    |                    |       |          |         |     |           |  |

## Summary Costs, Table of Task Deliverables and Team Lead(s)

| Task and Key Deliverable Description                  |  | Lead Team Member(s)                       | 50 Sites Cost |
|---|--|---|---------------|
| Task 1 Project Management                             |  |   | \$22,380      |
| 1.1   | Prepare consultant scope and contract  | Eric Christensen,<br>Jennifer Saltonstall |               |
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| Task 2 Study Design, QAPP Update and Selection        |  |   | \$58,180      |
| 2.1   | Summary meeting notes for Kick-off Meeting and Follow up meeting with Project Liaison and/or TAC | Bill Taylor                               | 9,614         |
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|   | 3% Contingency   |   | 17,979        |
|   | Total Project Cost with 3% Contingency   |   | \$614,159     |
|   |  |   |               |
|   | Task 3 Per site cost – \$7,602 labor + \$1,554 ODC   |   | \$9,157       |

ODC = Other direct costs, which include mileage, cost of water supply for infiltration testing, geotechnical laboratory testing (sieves and organic matter content) and field supplies including temporary well point, staff gauge, mounting hardware, flow metering and datalogger equipment.



|  |   |           |             |       | Principal                    |            | Hydrologic Design            |              | Hydro/Geotechnical Assessment |                                 |          |        |           | Plant Community and Maintenance |                    |     |           |           |  |
|--|---|-----------|-------------|-------|------------------------------|------------|------------------------------|--------------|-------------------------------|---------------------------------|----------|--------|-----------|---------------------------------|--------------------|-----|-----------|-----------|--|
| Long-Term Bioretention Study (LOI #13) |   |           |             |       |                              | Olympia    |                              | Investigator | Clear Creek Soln              | Associated Earth Sciences, Inc. |          |        |           |                                 | Raedeke Associates |     |           |           |  |
|  | Detailed scope of work and budget   | PM        | Finan. Mngt | Lead  |                              | Consultant | Principal                    | Sr. Staff/   | Staff                         | WP                              |          | Senior | Lead      | Field II                        | Field I            |     | Labor     |           |  |
|  |   |           |             | \$164 |                              | \$200      | \$205                        | \$110        | \$95                          | \$60                            |          | \$222  | \$164     | \$116                           | \$103              |     | Subtotal  |           |  |
| Task 1                                 | Project Management  |           |             |       |                              |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 1.1                                    | Prepare consultant scope and contract   |           |             |       |                              |            | 8                            |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 1.2                                    | Prepare quarerly progress reports (15 months, 5 reports)                      |           |             |       |                              |            | 50                           |              |                               | 4                               |          |        |           |                                 |                    |     |           |           |  |
| 1.3                                    | Coordinate communication w/ Ecology and partner jurisdictions and consultants |           |             |       |                              |            | 50                           |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| Task 1 subtotal                        |   |           |             |       |                              |            |                              |              |                               |                                 | \$22,380 |        |           |                                 |                    |     | \$22,380  |           |  |
| Task 2                                 | Study Design, QAPP Update and Site Selection                                  |           |             |       |                              |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 2.1                                    | Planning meetings and Project Liaison or TAC, Summary Meeting Notes           |           |             |       | 18                           | 8          | 18                           |              |                               | 1                               |          |        | 8         |                                 |                    |     |           |           |  |
| 2.2                                    | Update Quality Assurance Project Plan (QAPP)                                  |           |             |       | 8                            | 0          | 4                            |              |                               | 2                               |          |        | 4         |                                 |                    |     |           |           |  |
| 2.3                                    | Develop site selection criteria checklist                                     |           |             |       | 4                            | 0          | 1                            |              |                               | 1                               |          |        |           |                                 |                    |     |           |           |  |
| 2.4                                    | Site selection communication; doc organization; visit sites                   |           |             |       | 155                          | 2          | 20                           | 80           |                               | 2                               |          |        | 2         |                                 |                    |     |           |           |  |
| 2.5                                    | Site selection summary TM   |           |             |       | 15                           | 2          | 8                            |              |                               | 2                               |          |        | 2         |                                 |                    |     |           |           |  |
| Task 2 subtotal                        |   |           |             |       |                              |            | \$32,800                     | \$2,400      |                               | \$19,735                        |          |        | \$2,624   |                                 |                    |     | \$57,559  |           |  |
| Task 3                                 | Field Assessment, Data Collection and Analysis                                |           |             |       |                              |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 3.1                                    | Hydrologic review and memo report   |           |             |       |                              | 120        | 4                            |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 3.2                                    | Geotech assessment and memo report  |           |             |       |                              |            | 105                          | 1175         | 800                           | 10                              |          |        |           |                                 |                    |     |           |           |  |
|  | -site/regional soil/geo review, data sheet creation                           |           |             |       |                              |            | 10                           | 50           | 0                             | 0                               |          |        |           |                                 |                    |     |           |           |  |
|  | -hydrant meter/water supply requests - 50 sites                               |           |             |       |                              |            | 10                           | 50           | 0                             | 0                               |          |        |           |                                 |                    |     |           |           |  |
|  | -access/locate site visit, pick up hydrants/water supply parts                |           |             |       |                              |            | 10                           | 0            | 200                           | 0                               |          |        |           |                                 |                    |     |           |           |  |
|  | -50-sites: infiltration test, geotech augers, wellpoints                      |           |             |       |                              |            | 25                           | 400          | 600                           | 0                               |          |        |           |                                 |                    |     |           |           |  |
|  | -laboratory testing: grain size and organic matter testing                    |           |             |       |                              |            |                              | 25           |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
|  | -Data analysis/report: test data, lab data reduction, compilation             |           |             |       |                              |            | 50                           | 400          |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
|  | -Site maps (3 per site) - USGS topo, aerial subbasin, facility aerial/sketch  |           |             |       |                              |            |                              | 200          |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
|  | -Compile facility testing data, summary memo, composite tables                |           |             |       |                              |            |                              | 50           |                               | 10                              |          |        |           |                                 |                    |     |           |           |  |
| 3.3                                    | Vegetation assessment and maintenance survey memo report                      |           |             |       |                              |            | 4                            |              |                               |                                 |          | 20     | 300       | 500                             | 150                |     |           |           |  |
|  | -Field  |           |             |       |                              |            |                              |              |                               |                                 |          | 0      | 200       | 300                             | 150                |     |           |           |  |
|  | -Report   |           |             |       |                              |            | 2                            |              |                               |                                 |          | 20     | 100       | 200                             | 0                  |     |           |           |  |
| Task 3 subtotal                        |   |           |             |       |                              |            | \$0                          | \$24,000     |                               | \$229,015                       |          |        | \$127,090 |                                 |                    |     | \$380,105 |           |  |
| Task 4                                 | Summary Analysis and Report   |           |             |       |                              |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 4.1                                    | SWG/TAC meeting and prep, Summary meeting notes                               |           |             |       | 8                            | 4          | 8                            |              |                               |                                 |          |        | 4         |                                 |                    |     |           |           |  |
| 4.2                                    | Analysis and Draft report   |           |             |       | 104                          | 10         | 18                           | 24           |                               | 4                               |          |        | 16        |                                 |                    |     |           |           |  |
|  | -Format collected performance data for site comparison/ SWG meeting           |           |             |       | 8                            | 6          | 6                            | 24           |                               |                                 |          |        | 6         |                                 |                    |     |           |           |  |
|  | -compare geotech data, veg data, maintenance data, design data                |           |             |       | 24                           |            | 6                            |              |                               |                                 |          |        | 6         |                                 |                    |     |           |           |  |
|  | -Identify result differences  |           |             |       | 16                           |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
|  | -Produce summary comparisons  |           |             |       | 16                           |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
|  | -draft report   |           |             |       | 40                           | 4          | 6                            |              |                               | 4                               |          |        | 4         |                                 |                    |     |           |           |  |
| 4.3                                    | Summary meeting notes, discuss draft, inc SWG/Ecology edits to draft report   |           |             |       | 24                           | 8          | 12                           |              |                               | 4                               |          |        | 2         |                                 |                    |     |           |           |  |
| 4.4                                    | Final Report  |           |             |       | 10                           |            | 4                            |              |                               | 4                               |          |        |           |                                 |                    |     |           |           |  |
| Task 4 subtotal                        |   |           |             |       |                              |            | \$23,944                     | \$4,400      |                               | \$11,970                        |          |        | \$3,608   |                                 |                    |     | \$43,922  |           |  |
| Task 5                                 | Distribution of Findings  |           |             |       |                              |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 5.1                                    | Prepare and Present Findings to the SWG                                       |           |             |       | 24                           | 6          | 16                           |              |                               |                                 |          |        | 6         |                                 |                    |     |           |           |  |
| 5.2                                    | Two-page summary for SAM Fact Sheet   |           |             |       | 4                            |            |                              |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| 5.3                                    | Virtual presentations - coordinate with 6 organizations                       |           |             |       | 12                           |            | 9                            |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| Task 5 subtotal                        |   |           |             |       |                              |            | \$6,560                      | \$1,200      |                               | \$5,125                         |          |        | \$984     |                                 |                    |     | \$13,869  |           |  |
|  | Total Hours   |           |             |       | 386                          |            | 160                          |              |                               | 339                             | 1279     | 800    | 34        |                                 | 20                 | 344 | 500       | 150       |  |
| total hours * rate                     |   |           |             |       |                              |            | \$63,304                     | \$32,000     |                               | \$288,225                       |          |        | \$134,306 |                                 |                    |     |           | \$517,835 |  |
|  | Total Labor   | \$517,835 |             |       | Task 3 Per site cost - labor |            | \$7,602                      |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
|  | Total ODC's   | \$78,345  |             |       | Task 3 Per site cost - ODC   |            | \$1,554                      |              |                               |                                 |          |        |           |                                 |                    |     |           |           |  |
| Grand Total                            |   |           |             |       |                              | \$596,180  | Task 3 Per site cost - total |              | \$9,157                       |                                 |          |        |           |                                 |                    |     |           |           |  |

**Exhibit "C"**  
**STATEMENT OF COMPLIANCE WITH NONDISCRIMINATION REQUIREMENT**

The Olympia City Council has made compliance with the City's *Nondiscrimination in Delivery of City Services or Resources* ordinance (OMC 1.24) a high priority, whether services are provided by City employees or through contract with other entities. It is important that all contract agencies or vendors and their employees understand and carry out the City's nondiscrimination policy. Accordingly, each City agreement or contract for services contains language that requires an agency or vendor to agree that it shall not unlawfully discriminate against an employee or client based on any legally protected status, which includes but is not limited to: race, creed, religion, color, national origin, age, sex, marital status, veteran status, sexual orientation, gender identity, genetic information, or the presence of any disability. Unlawful discrimination includes transphobic discrimination or harassment, including transgender exclusion policies or practices in health benefits.

Listed below are methods to ensure that this policy is communicated to your employees, if applicable.

- Nondiscrimination provisions are posted on printed material with broad distribution (newsletters, brochures, etc.).
- Nondiscrimination provisions are posted on applications for service.
- Nondiscrimination provisions are posted on the agency's web site.
- Nondiscrimination provisions are included in human resource materials provided to job applicants and new employees.
- Nondiscrimination provisions are shared during meetings.

**Failure to implement at least two of the measures specified above or to comply with the City of Olympia's nondiscrimination ordinance constitutes a breach of contract.**

By signing this statement, I acknowledge compliance with the City of Olympia's nondiscrimination ordinance by the use of at least two of the measures specified above.

Jennifer H. Saltonstall  
(Signature)

09/15/2022  
(Date)

Jennifer H. Saltonstall, L.Hg., Vice President  
Print Name of Person Signing

**Alternative Section for Sole Proprietor:** I am a sole proprietor and have reviewed the statement above. I agree not to discriminate against any client, or any future employees, based on any legally protected status.

\_\_\_\_\_  
(Sole Proprietor Signature)

\_\_\_\_\_  
(Date)

***Exhibit "D"***  
**EQUAL BENEFITS COMPLIANCE DECLARATION**

**Contractors or consultants on City agreements or contracts estimated to cost \$50,000 or more** shall comply with Olympia Municipal Code, Chapter 3.18. This provision requires that if contractors or consultants provide benefits, they do so without discrimination based on age, sex, race, creed, color, sexual orientation, national origin, or the presence of any physical, mental or sensory disability, or because of any other status protected from discrimination by law. Contractors or consultants must have policies in place prohibiting such discrimination, prior to contracting with the City.

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I declare that the Consultant listed below complies with the City of Olympia Equal Benefits Ordinance, that the information provided on this form is true and correct, and that I am legally authorized to bind the Consultant.

Jennifer H. Saltonstall, L.Hg.

\_\_\_\_\_  
Consultant Name

*Jennifer H. Saltonstall*

\_\_\_\_\_  
Signature

Jennifer H. Saltonstall

\_\_\_\_\_  
Name (please print)

09/15/2022

\_\_\_\_\_  
Date

Principal Hydrogeologist, Vice President

\_\_\_\_\_  
Title