



IAA No. C1800070

INTERAGENCY AGREEMENT (IAA)

BETWEEN

THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY

AND

KING COUNTY

THIS INTERAGENCY AGREEMENT (“Agreement” or “IAA”) is made and entered into by and between the state of Washington, Department of Ecology, hereinafter referred to as "ECOLOGY," and KING COUNTY hereinafter referred to as the "COUNTY," pursuant to the authority granted by state law and King County Charter Section 120.

THE PURPOSE OF THIS AGREEMENT is to implement an effectiveness study through the Stormwater Action Monitoring Program (SAM) that provides National Pollutant Discharge Elimination System (NPDES) Municipal permittees a new bioretention media specification that minimizes pollutant leaching and aquatic toxicity, supports plant growth, and meets Ecology’s treatment objectives for total suspended solids, copper, zinc and phosphorus.

WHEREAS, ECOLOGY has legal authority (RCW 90.48 and WAC 173-220) and KING COUNTY has legal authority (King County Code Title 9) that allows each party to undertake the actions in this agreement.

THEREFORE, IT IS MUTUALLY AGREED THAT:

1) SCOPE OF WORK

The COUNTY shall furnish the necessary personnel, equipment, material and/or service(s) and otherwise do all things necessary for or incidental to the performance of the work set forth in Appendix A, Statement of Work and Budget, attached hereto and incorporated herein.

2) PERIOD OF PERFORMANCE

The period of performance of this IAA shall commence on **February 1, 2018**, or the date of final signature, whichever comes later, and be completed by **January 1, 2020**, unless terminated sooner as provided herein. Amendments extending the period of performance, if any, shall be at the sole discretion of ECOLOGY.

3) COMPENSATION

Compensation for the work provided in accordance with this IAA has been established under the terms of RCW 39.26.180(3). This is a performance-based agreement, in which payment is based on the successful completion of expected deliverables.

The source of funds for this IAA is General Fund/ Private-Local account for Stormwater Action Monitoring.

The parties have determined that the cost of accomplishing the work identified herein will not exceed \$388,450, including any indirect charges. Payment for satisfactory performance of the work shall not exceed this amount unless the parties mutually agree via an amendment to a higher amount. Compensation for services shall be based on the terms and tasks set forth in Appendix A, Statement of Work and Budget. ECOLOGY will not make payment until it has reviewed and accepted the completed work.

4) BILLING AND PAYMENT PROCEDURE

Payment requests shall be submitted on state form, Invoice Voucher A19-1A. Invoices shall describe and document to ECOLOGY's satisfaction a description by task and deliverable number, the work performed and related costs. Each invoice voucher shall reference the Agreement (IAA) number and clearly identify those items that relate to performance under this Agreement. Payment will be made within thirty (30) days of submission of a properly completed invoice (form A19-1A) with supportive documentation. All expenses invoiced shall be supported with copies of invoices paid.

Send invoices to:

**State of Washington
Department of Ecology
Attn: Brandi Lubliner
P.O. Box 47600
Olympia, WA 98504-7600**

Payment requests shall be submitted at the completion of the work and acceptance of the deliverables listed in Appendix A. Upon expiration of this Agreement, any claim for payment not already made shall be submitted to ECOLOGY within 30 days after the expiration date or the end of the fiscal year, whichever is earlier.

Payment will be issued through the Washington State Department of Enterprise Services Statewide Payee Desk. To receive payment you must be registered as a state-wide vendor. To register submit a state-wide vendor registration form and an IRS W-9 form at website, <http://www.des.wa.gov/services/ContractingPurchasing/Business/VendorPay/Pages/default.aspx>. If you have questions about the vendor registration process you can contact DES at the Payee Help Desk at (360) 407-8180 or email payeehelpdesk@watech.wa.gov.

5) ALTERATIONS AND AMENDMENTS

This Agreement may be amended by mutual agreement of the parties. Such amendments shall not be binding unless they are in writing and signed by personnel authorized to bind each of the parties.

6) ASSIGNMENT

The work to be provided under this Agreement, and any claim arising thereunder, is not assignable or delegable by either party in whole or in part, without the express prior written consent of the other party, which consent shall not be unreasonably withheld.

7) ASSURANCES

Parties to this Agreement agree that all activity pursuant to this agreement will be in accordance with all the applicable current federal, state, and local laws, rules, and regulations.

8) CONFORMANCE

If any provision of this Agreement violates any statute or rule of law of the state of Washington, it is considered modified to conform to that statute or rule of law.

9) DISPUTES

Parties to this Agreement shall employ every effort to resolve a dispute themselves without resorting to litigation. In the event that a dispute arises under this Agreement that cannot be resolved among the parties, it shall be determined by a Dispute Board in the following manner. Each party to this Agreement shall appoint one member to the Dispute Board. The members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, agreement terms, and applicable statutes and rules, and then make a determination of the dispute. The determination of the Dispute Board shall be final and binding on the parties hereto, unless restricted by law. The cost of resolution will be borne by each party paying its own cost. As an alternative to this process, if state agencies, either of the parties may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control. The parties may mutually agree to a different dispute resolution process.

10) FUNDING AVAILABILITY

ECOLOGYS ability to make payments is contingent on availability of funding. In the event funding from state, federal, or other sources is withdrawn, reduced, or limited in any way after the effective date and prior to completion or expiration date of this Agreement, ECOLOGY, at its sole discretion, may elect to terminate the Agreement, in whole or part, for convenience or to renegotiate the Agreement subject to new funding limitations and conditions. ECOLOGY may also elect to suspend performance of the Agreement until ECOLOGY determines the funding insufficiency is resolved. ECOLOGY may exercise any of these options with no notification restrictions, although ECOLOGY will make a reasonable attempt to provide notice.

In the event of termination or suspension, ECOLOGY will reimburse eligible costs incurred by the CONTRACTOR through the effective date of termination or suspension. Reimbursed costs must be agreed to by ECOLOGY and the CONTRACTOR. In no event shall ECOLOGYS reimbursement exceed ECOLOGYS total responsibility under the agreement and any amendments.

KING COUNTYS obligation to provide services under this Agreement is contingent on appropriation of funding by KING COUNTYS legislative body. If no such appropriation is made for any future year, this Agreement will terminate at the close of the appropriation year for which the last appropriation that funds these activities was made.

11) GOVERNING LAW AND VENUE

This Agreement is entered into pursuant to and under the authority granted by the laws of the state of Washington and any applicable federal laws. The provisions of this Agreement shall be construed to conform to those laws. This Agreement shall be construed and interpreted in accordance with the laws of the state of Washington, and the venue of any action brought hereunder shall be in the Superior Court for Thurston County.

12) INDEPENDENT CAPACITY

The employees or agents of each party who are engaged in the performance of this Agreement shall continue to be employees or agents of that party and shall not be considered for any purpose to be employees or agents of the other party.

13) ORDER OF PRECEDENCE

In the event of an inconsistency in the terms of this Agreement, or between its terms and any applicable statute or rule, the inconsistency shall be resolved by giving precedence in the following order:

- a. Applicable federal and state of Washington statutes, regulations, and rules.
- b. Mutually agreed upon written amendments to this Agreement.
- c. This Agreement, number C1800070.
- d. Appendix A, Statement of Work and Budget.
 - Any other provisions or term of this Agreement, including materials incorporated by reference or otherwise incorporated.

14) RECORDS MAINTENANCE

The parties to this Agreement shall each maintain books, records, documents and other evidence that sufficiently and properly reflect all direct and indirect costs expended by either party in the performance of the service(s) described herein. These records shall be subject to inspection, review or audit by personnel of both parties, other personnel duly authorized by either party, the Office of the State Auditor, and federal officials so authorized by law. All books, records, documents, and other material relevant to this Agreement will be retained for six years after expiration of this Agreement and the Office of the State Auditor, federal auditors, and any persons duly authorized by the parties shall have full access and the right to examine any of these materials during this period.

Records and other documents, in any medium, furnished by one party to this Agreement to the other party, will remain the property of the furnishing party, unless otherwise agreed. The receiving party will not disclose or make available this material to any third parties without first giving notice to the furnishing party and giving it a reasonable opportunity to respond. Each party will utilize reasonable security procedures and protections to assure that records and documents provided by the other party are not erroneously disclosed to third parties subject to state public disclosure laws.

15) RESPONSIBILITIES OF THE PARTIES

Each party of this Agreement hereby assumes responsibility for claims and/or damages to persons and/or property resulting from any acts or omissions on the part of itself, its employees, its officers, and its agents. Neither party will be considered the agent of the other party to this Agreement.

16) RIGHTS IN DATA

Unless otherwise provided, data which originates from this Agreement shall be "work made for hire" as defined by the United States Copyright Act, Title 17 U.S.C. section 101 and shall be owned by state of Washington, ECOLOGY. Data shall include, but not be limited to, reports, documents, pamphlets, advertisements, books magazines, surveys, studies, computer programs, films, tapes, and/or sound reproductions. Ownership includes the right to copyright, patent, register, and the ability to transfer these rights.

17) SEVERABILITY

If any provision of this Agreement or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Agreement which can be given effect without the invalid provision, if such remainder conforms to the requirements of applicable law and the fundamental purpose of this Agreement, and to this end the provisions of this Agreement are declared to be severable.

18) SUBCONTRACTORS

The COUNTY agrees to take complete responsibility for all actions of any Subcontractor used under this Agreement for the performance. When federal funding is involved there will be additional subcontractor requirements and reporting.

Prior to performance, all subcontractor who will be performing services under this Agreement must be identified, including their name, the nature of services to be performed, address, telephone, WA State Department of Revenue Registration Tax number (UBI), federal tax identification number (TIN), and anticipated dollar value of each subcontract. Provide such information to ECOLOGY's agreement manager.

19) TERMINATION FOR CAUSE

If for any cause, either party does not fulfill in a timely and proper manner its obligations under this Agreement, or if either party violates any of these terms and conditions, the aggrieved party will give the other party written notice of such failure or violation. The responsible party will be given the opportunity to correct the violation or failure within fifteen (15) business days. If failure or violation is not corrected, this Agreement may be terminated immediately by written notice of the aggrieved party to the other.

20) TERMINATION FOR CONVENIENCE

Either party may terminate this Agreement without cause upon thirty (30) calendar day prior written notification to the other party. If this Agreement is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Agreement prior to the effective date of termination.

21) WAIVER

A failure by either party to exercise its rights under this Agreement shall not preclude that party from subsequent exercise of such rights and shall not constitute a waiver of any other rights under this Agreement unless stated to be such in a written amendment to this Agreement signed by an authorized representative of the parties.

22) AGREEMENT MANAGEMENT

The representative for each of the parties shall be responsible for and shall be the contact person for all communications, notifications, questions regarding billing, and the performance of this Agreement. The parties agree that if there is a change in representatives that they will promptly notify the other party in writing of such change, such changes do not need an amendment.

The ECOLOGY Representative is:	The KING COUNTY Representative is:
Name: Brandi Lubliner Address: 300 Desmond Dr. SE (USPS) P.O. Box 47600 (FedEx) Olympia, WA 98504-7600 Phone: 360-407-7140 Email: Brandi.Lubliner@ecy.wa.gov	Name: Jenée Colton Address: 201 S. Jackson, Suite 600 Seattle, WA 98104 Phone: 206.477.4075 Email: jenee.colton@kingcounty.gov

23) ALL WRITINGS CONTAINED HEREIN

This Agreement contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the parties hereto.

The signatories to this Agreement represent that they have the authority to bind their respective organizations to this Agreement.

IN WITNESS WHEREOF, the parties below, having read this Agreement in its entirety, including all attachments, do agree in each and every particular as indicated by their below signatures.

**State of Washington
Department of Ecology**

**State of Washington
King County**

By: _____

Signature

_____ Date

By: _____

Signature

_____ Date

_____ Print Name: Polly Zehm

_____ Print Name:

_____ Title: Deputy Director

_____ Title:

Approved as to form only:
Office of Attorney General

APPENDIX A STATEMENT OF WORK AND BUDGET

Bioretention Media Blends to Improve Stormwater Treatment: Final Phase of Study to Develop New Specifications

Project Purpose

This project is Phase 2 of a two-phase, three-year effort to develop science-based recommendations for a high performance bioretention soil mix (BSM) specification (the “Project”). These recommendations will be considered for adoption by Ecology to more effectively deploy bioretention as part of Minimum Requirement #6 of the Washington Department of Ecology 2014 Stormwater Management Manual for Western Washington (SWMMWW)(Ecology 2014).

Background

The Bioretention Work Group (BWG) is a collaboration of municipalities, academics, and Herrera that have conducted several studies examining the effectiveness of compost and other materials as components of bioretention soil mixes (BSMs). The BWG is comprised of representatives from the Washington Department of Ecology (Ecology), City of Redmond, Herrera, Inc., City of Portland, City of Tacoma, City of Seattle, Kitsap County, King County, Thurston County and Washington State University (WSU). The BWG completed the Phase 1 study in 2017 (Herrera 2017) whose results directly inform the design of the Project (Phase 2). In Phase 1, select bioretention media components were individually tested for their leaching potential, and geophysical characteristics. Those components were combined into various media blends and the blends were assessed for supporting plants.

For the Project, select BWG members - Ecology, Herrera, King County, Redmond, Kitsap County, and Seattle and WSU – will comprise the Project Team. The remaining BWG members will form the Project Advisory Group. King County will act as the administrator.

Goals, Objectives and Outcomes

The overall goal of the Project is to develop new recommendations for a BSM that protects beneficial uses of receiving waters and achieves the following benchmarks in order of priority: 1) meets basic treatment (Ecology’s treatment objectives for TSS); 2) meets enhanced treatment (Ecology’s treatment objectives for dissolved copper and zinc); 3) meets Ecology’s treatment objective for phosphorus; and 4) is affordable and available.

Project objectives:

- Confirm that the Project study design meets BWG’s and Ecology’s needs for recommending new BSM specifications required by the Western Washington NPDES municipal stormwater permits.
- Identify the optimum BSM blend(s) based on the Project’s results for export potential and pollutant capture capability.

- Determine metrics and numeric ranges for the new BSMs that can be consistently replicated in western and eastern Washington.
- Evaluate the ability of the media treatments to reduce or eliminate toxicity in aquatic animals exposed to urban stormwater runoff.

Short-term outcomes:

- Develop Washington State specifications for an improved BSM that:
 - reduce contaminant flushing compared to the current 60/40 BSM;
 - meet Ecology’s treatment objectives for total suspended solids (TSS), dissolved copper and zinc, and phosphorus;
 - support plants; and
 - minimize toxicity to aquatic organisms.
- New, science-based metrics (from comprehensive testing of BSM components and blends) that more accurately describe BSM specifications and made available statewide.

Long-term outcome:

- Make recommendations to Ecology for consideration and adoption as an alternative BSM in the SWMMWW for use in bioretention facilities.

Task 1: Project management (Total Cost \$21,390)

King County’s responsibilities include, but are not limited to: coordination with the SAM Coordinator; subcontracting administration; invoice submittal and corresponding backup documentation; and progress reports. The subcontractor, Herrera (Curtis Hinman), will share responsibilities for project management including communication with the SAM Coordinator, and one presentation to the Stormwater Work Group (SWG). Deliverables will need to be made ADA accessible following guidance from the SAM coordinator.

Deliverable D1.1 - Semi-annual progress report. Target Date: June 2018. Target Cost: 25%.

Deliverable D1.2 - Semi-annual progress report. Target Date: January 2019. Target Cost: 25%.

Deliverable D1.3 - Semi-annual progress report. Target Date: June 2019. Target Cost: 25%.

Deliverable D1.4 - Semi-annual progress report. Target Date: January 2020. Target Cost: 25%.

Task 2.0 Convene Project Advisory Group (\$13,253)

To initiate the Project, the Project Team will coordinate a series of in-person meetings and teleconferences with the Project Advisory Group to review Project objectives. With this information, the Project Team will refine the Project approach and provide ongoing input as the Project progresses. Project Advisory Group input will be solicited at the following Project milestones:

- At the beginning of the study to review the Quality Assurance Project Plan (QAPP) (in-person meeting).

- To review and confirm BSM component and blend selection based on results from the Phase 1 study (in-person meeting).
- At the conclusion of flushing and dosing tests to review results, select best performing media(s) and provide input on additional testing if necessary (in-person meeting).
- At the beginning of determining appropriate metrics for media specification to provide input on the physical and chemical characteristics of the BSM components and blends that should be evaluated to develop new specifications (in-person meeting).
- At the conclusion of laboratory analysis of media components and blends to review results and provide input on the recommendations for new BSM specifications (teleconference and email).
- Provide technical review and input for preliminary and final report.

Deliverable D2.1 - Meeting agenda and notes from Project Team and Project Advisory Group kickoff meeting. Target Date: March 2018. Target Cost: 25%

Deliverable D2.2 - Meeting agenda and notes from team meeting on media component and blend selection. Target Date: May 2018. Target Cost: 25%

Deliverable D2.3 - Meeting agenda and notes from team meeting on review of test results and selection of best performing media(s). Target Date: January 2019. Target Cost: 25%

Deliverable D2.4 - Meeting agenda and notes from team meeting on physical and chemical characteristics of components and blends for BSM specification. Target Date: February 2019. Target Cost: 25%

Task 3.0 Develop Project QAPP (\$8,421)

The Project Team will prepare a draft and final QAPP in accordance with the Washington State Department of Ecology's *Guidelines for Quality Assurance Project Plans* (Ecology 2004) to describe the testing procedures used to evaluate the treatment performance of the BSM blends. The QAPP will provide a detailed description of the Method Quality Objectives, experimental design and procedures, QA/QC, statistical approach, and other quality control measures.

Deliverable D3.1 - Draft QAPP. Target Date: April 2018. Target Cost: 60%

Deliverable D3.2 - Final QAPP. Target Date: May 2018. Target Cost: 40%

Task 4.0 Test Media Blends (\$251,860)

The Project Team will conduct testing to evaluate the treatment performance of BSM blends in accordance with the QAPP developed in Task 3. The proposed media components and blends will be selected based on results of the completed BWG Phase 1 study (Herrera 2017), and the proposed blends will be confirmed in this task by the Project Advisory Group.

Confirm Flow and Water Quality Acceptance Criteria

Determine water quality treatment acceptance criteria for: total suspended solids, total phosphorus, nitrate-nitrite, dissolved Cu and Zn treatment capability.

Flush, Dose and Test Conduct Hydraulic Conductivity of Media Blends

Place selected media blends in eight-inch diameter columns (with 3x replication). The media depth will be 18 inches on top of a 12-inch drainage layer to simulate field application (drainage layer composition will be determined by project team). A maximum of eight separate media blends will be analyzed resulting in a total of 24 columns to be tested. The media blends will be tested in the columns using a three-step process outlined below.

First, flush columns with deionized water at specified rates to analyze the pollutant export potential for following parameters using guidelines in the QAPP:

- pH.
- Total Suspended Solids (TSS).
- Total and dissolved copper (Cu), zinc (Zn), lead (Pb) and cadmium (Cd).
- Nitrate+nitrite.
- Total phosphorus (TP).
- Ortho phosphorus (ortho-P).
- Dissolved organic carbon (DOC).
- Total petroleum hydrocarbons (motor oil and diesel fractions).
- Polycyclic aromatic hydrocarbons (PAHs).
- Bacteria (enterococcus and fecal coliform).

A maximum of four samples will be collected from each column during the flushing period. Sample collection will correspond to 25, 50, 75, 100% of a Seattle area water year using a contributing to bioretention area ratio determined by the project team.

Second, test hydraulic conductivity using a falling head procedure for each media blend in columns to correlate treatment capability with contact time. Third, dose columns using actual stormwater (augmented if necessary to meet concentration ranges determined by project team and meets TAPE requirements) and collect and analyze a maximum of 8 effluent samples from each column for pH, TSS, total and dissolved Cu, Zn, Pb and Cd, nitrate+nitrite, TP, ortho-P, DOC, total petroleum hydrocarbons (motor oil and diesel fractions), PAHs, and bacteria (fecal coliform) following guidelines in the QAPP.

Determine Appropriate Metrics and Conduct Laboratory Analysis for Specification

To provide recommendations for BSM specification the appropriate metrics and numeric ranges for those metrics must be determined using data from the above analyses. Metrics for components and blends are necessary for suppliers and designers to identify materials and processes that assure consistent performance of the BSM.

Select and analyze the media components for specific physical and chemical characteristics that will be used for developing a BSM specification. Potential metrics include (a final list will be determined by the project team):

- Synthetic Precipitation Leaching Protocol extractions (SPLP tests conducted in Phase 1 study).
- N, P (exact form of N&P to be determined by Project Team) and Cu sorption capacity (sorption tests performed in Phase 1 study).
- Water holding capacity.
- Cation exchange capacity.
- Electrical conductivity.

- P availability test (e.g. Bray test for adsorbed forms of phosphate).
- Particle size distribution.

Select and analyze the media blends for specific physical and chemical characteristics that will be used for developing a BSM specification. Potential metrics include (a final list will be determined by the project team):

- Water holding capacity.
- Cation exchange capacity.
- Electrical conductivity.
- Carbon to nitrogen ratio.¹
- Organic matter content.¹
- Iron/aluminum oxalate ratio.¹

Deliverable D4.1 - Water quality laboratory results with quality control (QC) audits from a maximum of 4 flushing events for up to 8 media blends in columns. Saturated hydraulic conductivity results for 8 media blends. Water quality laboratory results with quality control (QC) audits from a maximum of 8 dosing events for up to 8 media blends in columns. Target Date: December 2018. Target Cost: 86%

Deliverable D4.2 - Physical and chemical characteristics (metrics) for developing specifications with QC audits for a maximum of 6 media components. Target Date: January 2019. Target Cost: 7%

Deliverable D4.3 - Physical and chemical characteristics (metrics) for developing specifications with QC audit for a maximum of 3 media blends. Target Date: February 2019. Target Cost: 7%

Task 5.0 Evaluate Ability of Media Blends to Protect Aquatic Organisms (\$36,368)

The Project Team will conduct toxicological tests to determine how well the new blends remove chemical(s) that produce acute toxicity in aquatic animals exposed to urban stormwater runoff. Tests will be conducted on high-throughput model aquatic organisms in order to efficiently screen BSM blends for biological effectiveness. An early life stage screening test using zebrafish (*Danio rerio*) embryos will be used to assess survival and sub-lethal toxicity to fish. *Daphnia* (*Ceriodaphnia dubia*) neonates will be used to test toxicity to aquatic invertebrates.

Sampling

- During the 8 column dosing events, sub-samples will be taken from the BSM effluent water for the toxicological tests.
- The 3 replicates from each treatment will be combined to one composite sample.

Toxicity Testing

- For each media blend composite sample collected, conduct 48-hour acute toxicity tests with larval fish (zebrafish embryos) and aquatic invertebrates (daphnid neonates).

¹ These parameters are appropriate only for blends, not individual components.

- Larval fish tests will follow protocols developed by McIntyre et al. (2014) to quantify survival and sub-lethal impacts on larval growth and cardiovascular impairment.
- Invertebrate tests will follow OECD 202 (Daphnia spp. Acute Immobilization Test) for viability of *C. dubia* neonates.

Deliverable D5.1 - 45 acute toxicity test results (water samples for toxicological tests will be sub-samples from effluent water collected for dosing media blends, Task 4.2). Target Date: February 2019. Target Cost: 100%

Task 6.0 Reporting and Distribution of Findings (\$57,158)

The Project Team will review findings from the media and toxicological analyses and develop a draft project report. The report will summarize experimental design, data analysis, and provide recommendations for new default BSM specifications and guidelines that target specific water quality treatment objectives(s).

A two-page summary of the results and a presentation will be given to the SWG at project completion summarizing findings from the media and toxicological analyses in the draft project report. The Project Team will collect input from the Advisory Group and the SWG to develop the final project report.

Deliverable D6.1 - Draft report. Target Date: May 2019. Target Cost: 50%

Deliverable D6.2 - Presentation to SWG. Target Date: May 2019. Target Cost: 3%

Deliverable D6.3 - Two-page Fact Sheet for the SAM. Target Date: May 2019. Target Cost: 1%

Deliverable D6.4 - Final report. Target Date: September 2019. Target Cost: 46%

References

Ecology. 2014. 2012 Stormwater Management Manual for Western Washington (as Amended in 2014). Publication Number 14-10-055. Washington State Department of Ecology. December 2014.

Herrera. 2017. Bioretention Media Component Analysis to Improve Runoff Treatment. Prepared for Kitsap County, by Herrera Environmental Consultants, Inc., Seattle, Washington. June 30, 2017.

McIntyre et al. 2014. *Zebrafish and clean water technology: Assessing soil bioretention as a protective treatment for toxic urban runoff*. Science of the Total Environment. 500-501 (173-180).

Project Budget and Schedule

Table 1: Project Budget by Deliverable.

Deliverable by Task	Total Deliverable Cost
Task 1.0 Project Management	
D1.1 Semi-annual Progress Report	\$5,347.00
D1.2 Semi-annual Progress Report	\$5,347.00
D1.3 Semi-annual Progress Report	\$5,347.00
D1.4 Semi-annual Progress Report	\$5,347.00
<i>Task total</i>	\$21,390.00
Task 2.0 Convene Project Partners	
D2.1 Meeting agenda and notes	\$3,313.25
D2.2 Meeting agenda and notes	\$3,313.25
D2.3 Meeting agenda and notes	\$3,313.25
D2.4 Meeting agenda and notes	\$3,313.25
<i>Task total</i>	\$13,253.00
Task 3.0 Develop Project QAPP	
D3.1 Draft QAPP	\$5,000.00
D3.2 Final QAPP	\$3,421.00
<i>Task total</i>	\$8,421.00
Task 4.0 Test Media Blends	
D4.1 Lab results for flushing, dosing, and conductivity tests	\$217,790.00
D4.2 Metrics for media components	\$17,035.00
D4.3 Metrics for media blends	\$17,035.00
<i>Task total</i>	\$251,860.00
Task 5.0 Evaluate Ability of Media Blends to Protect Aquatic Organisms	
D5.1 Sampling for Toxicity Tests	\$36,368.00
<i>Task total</i>	\$36,368.00
Task 6.0 Reporting	
D6.1 Draft report	\$28,582.00
D6.2 Presentation to SWG	\$2,000.00
D6.3 Two-page Summary for SWG	\$500.00
D6.4 Final Report	\$26,076.00
<i>Task total</i>	\$57,158.00
Total	\$388,450.00

Table 2: Project Schedule by Deliverable.

Tasks and Deliverable	Activities	2018		2019	
		Q1/Q2	Q3/Q4	Q1/Q2	Q3/Q4
Task 1.0	Project Management				
D1.1	Semi-annual Progress Report				
D1.2	Semi-annual Progress Report				
D1.3	Semi-annual Progress Report				
D1.4	Semi-annual Progress Report				
Task 2.0	Convene Project Partners				
D2.1	Meeting Agenda and Notes				
D2.2	Meeting Agenda and Notes				
D2.3	Meeting Agenda and Notes				
D2.4	Meeting Agenda and Notes				
Task 3.0	Develop Project QAPP				
D3.1	Draft QAPP				
D3.2	Final QAPP				
Task 4.0	Test Media Blends				
D4.1	Lab results for Flushing, Dosing, and Conductivity tests				
D4.2	Metrics for Media Component Spec				
D4.3	Metrics for Media Blend Spec				
Task 5.0	Protect Aquatic Organisms				
D5.1	Toxicity Test Results				
Task 6.0	Reporting				
D6.1	Draft Report				
D6.2	Presentation to SWG				
D6.3	Two-page Summary Findings				
D6.4	Final Report				

Note that the two-page summary and presentation to the Stormwater Work Group is an estimate and actual delivery will be coordinated with the Group's meeting schedule.