

Council Business Meeting

July 16, 2019

Agenda Item	Approval of Personal Services Contract – Water Quality Temperature Trading Program Partnership (2018-21); Phase Two	
From	Paula C. Brown, PE Kaylea Kathol	Public Works Director Public Works Project Manager
Contact	paula.brown@ashland.or.us kaylea.kathol@ashland.or.us	(541) 552-2411 (541) 552-2419

SUMMARY

Before the Council is a goods and services contract with The Freshwater Trust (TFT) for the first stage of the City’s multi-year water quality trading program. By implementing riparian shade projects consistent with the City’s Department of Environmental Quality (DEQ) accepted trading plan, the City will be able to use these projects to meet the Clean Water Act temperature compliance obligations associated with running the Wastewater Treatment Plant. This contract is for phase two, which will complete the first six years of the overall riparian restoration and shading program. The majority of the planting and plant establishment period during this six-year period will be covered through the Oregon Department of Environmental Quality’s Clean Water State Revolving Fund (DEQ CWSRF) loan program, which the City has already secured. Phase two is for a not to exceed amount of \$2,605,342 with a provision for an annual CPI-U rate increase.

POLICIES, PLANS & GOALS SUPPORTED

City Council Goals (supported by this project):

- Goal 1: Develop current and long-term budgetary resilience -- evaluate revenue streams
- Goal 3: Enhance and improve transparency and communication
 - Develop a robust program to engage with Ashland citizens about City priorities and our progress on those priorities...
- Maintain *Essential* Services - wastewater
- Continue to leverage resources to develop and/or enhance *Value Services*

Department Goals:

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

PREVIOUS COUNCIL ACTION

This project represents priorities within the Council approved 2012 Comprehensive Sewer Master Plan Update. The Riparian Restoration/Shading project has been included to meet anticipated temperature compliance needs at the wastewater treatment plant since 2010. This project is included in the 20-year Capital Improvements Program (CIP) adopted by Council on April 2, 2019.

At the September 4, 2018 business meeting, the City Council approved a personal services contract with The Freshwater Trust for professional services to develop and begin implementation of a water quality trading program for temperature compliance for the Wastewater Treatment Plant. This contract was only for phase one, which included the initial program design architecture of the overall riparian restoration and shading program. Phase one was approved for a not to exceed amount of \$130,988.

At the February 6, 2018 business meeting, the City Council approved revisions to the City's CWSRF. The new loan is for \$4,829,000, which will fund a significant portion of the Riparian Restoration/Shading compliance program (\$2,000,000) and the Outfall Relocation (\$2,829,000).

BACKGROUND AND ADDITIONAL INFORMATION

Staff advertised the request for qualifications based proposals on September 11, 2017. One proposal was received on May 15, 2018 from TFT and after staff review and recommendations, Council awarded the initial phase on September 4, 2018.

The Water Quality Trading Program is one of several capital projects included in the 2012 Comprehensive Sanitary Sewer Master Plan (Keller Associates) that will be needed in order to meet anticipated regulatory temperature limits stemming from the Clean Water Act.

A Water Quality Trading Plan was developed for the City under a previous contract with TFT. Ashland's Trading Plan was accepted by the DEQ on March 9, 2018, as being consistent with Oregon's Water Quality Trading Rule. As part of renewal of its National Pollution Discharge Elimination System (NPDES) permit (anticipated in 2020), the already approved Trading Plan will be incorporated into the City's NPDES permit. Ashland's trading program—which will be implemented according to the DEQ approved Trading Plan—will focus on implementing riparian re-vegetation projects to generate shade “credits” (specifically, kilocalories of blocked solar load, measured in the same units as the City's temperature permit limits). Once implemented, the City will be able to count these credits against its anticipated upcoming temperature obligation, and thus achieve compliance with the Clean Water Act. The Trading Plan will be a reference document for the contract with TFT.

FISCAL IMPACTS

The Riparian Restoration/Shading (water quality temperature credit) project includes \$4,000,000 in the 20-year CIP and \$1,065,000 in the 2019-21 BN Wastewater Fund (\$2,725,000 in the six-year CIP). All dollars in the CIP are shown as current year (2019) and will be adjusted during each biennium to reflect increases in construction costs.

This particular contract with TFT is unique as unlike typical construction projects, there are no “concrete” bid items. Costs are based on consultant personnel costs (e.g., recruitment, project management and oversight, monitoring), unique lease agreements with private landowners who agree to host trading projects on their streamside land, third party plant material costs, third party verification costs (which are required for project shade benefits to be considered “compliance grade” credits by DEQ), subconsultant planting and stewardship costs, and other factors, all of which will not remain static during a six-year project time period. In short, projects must be recruited, prepped, implemented, maintained, monitored and verified for a 20-year period. Because of the non-traditional nature of this program, it is staff's intent to report to Council on the project status each biennium; work completed, work anticipated during the next biennium, the remaining costs and impacts due to inflationary requirements. It is anticipated there would be change order(s) to adjust for inflation but as stated by TFT, there are “hopes to deliver the program for less than the estimated total but proposes to establish contractual not to exceed amounts associated with the more conservative estimate.”

Phase two is structured to allow TFT the time to secure and implement all needed trading sites. All other remaining program costs (e.g., remaining maintenance, monitoring and verification costs at all of the sites) will be included in the final phase of the project at a later date. Expenditures on this project to date are \$108,799. Prior expenditures for the riparian restoration included \$23,985 to The Freshwater Trust to analyze the water quality trading benefits and policy support for the City (2011-27).

STAFF RECOMMENDATION

Staff recommends Council move approval of a goods and services contract with The Freshwater Trust to execute the Water Quality Temperature Trading Program Partnership, Phase two in the amount not to exceed \$2,605,342 with a provision for an annual CPI-U rate increase. Phase two includes the first six years of the overall riparian restoration and shading program which will include the majority of the planting and plant establishment period for the Water Quality Temperature Trading Program.

ACTIONS, OPTIONS & POTENTIAL MOTIONS

Council has the option to approve this contract or refer staff back for renegotiation or a new request for proposals. Potential motions include:

1. I move to approve the execution of a personal services contract with The Freshwater Trust for the Water Quality Temperature Trading Program Partnership; Phase Two.
2. I move to direct staff to renegotiate terms with The Freshwater Trust for the Water Quality Temperature Trading Program Partnership.
3. I move to direct staff to develop a new solicitation for the Water Quality Temperature Trading Program Partnership.

ATTACHMENTS:

Attachment 1: Goods and Services Contract including the scope of work, cost and schedule, between the City and The Freshwater Trust for the Water Quality Temperature Trading Program Partnership, Phase two in the amount not to exceed \$2,605,342 with a provision for an annual CPI-U rate increase.

Attachment 2: City of Ashland Water Quality Temperature Trading Program

Attachment 3: CIP Water Quality Temperature Trading Program

Attachment 4: TFT Phase 1 Personal Services Agreement with SOW rate sheet

GOODS & SERVICES AGREEMENT

<p style="text-align: center;">CITY OF ASHLAND 20 East Main Street Ashland, Oregon 97520 Telephone: 541/488-5587 Fax: 541/488-6006</p>	<p>PROVIDER: The Freshwater Trust</p> <p>PROVIDER'S CONTACT: Tim Wiggington</p> <p>ADDRESS: 700 SW Taylor Street, Suite 200 Portland, Oregon 97205</p> <p>PHONE: (503) 222-9091 ext. 41</p>
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This Goods and Services Agreement (hereinafter "Agreement") is entered into by and between the City of Ashland, an Oregon municipal corporation (hereinafter "City") and The Freshwater Trust, a domestic nonprofit corporation ("hereinafter "Provider"), for goods and services related to Phase 2 of the City of Ashland Water Quality Trading Plan Partnership.

1. PROVIDER'S OBLIGATIONS

- 1.1 Provide goods and services related to and in support of Phase 2 of the City of Ashland Water Quality Trading Plan Partnership as more fully set forth in the "SUPPORTING DOCUMENTS" attached hereto and, by this reference, incorporated herein. Provider expressly acknowledges that time is of the essence of any completion date set forth in the SUPPORTING DOCUMENTS, and that no waiver or extension of such deadline may be authorized except in the same manner as herein provided for authority to exceed the maximum compensation. The goods and services defined and described in the "SUPPORTING DOCUMENTS" shall hereinafter be collectively referred to as "Work."
- 1.2 Provider shall obtain and maintain during the term of this Agreement and until City's final acceptance of all Work received hereunder, a policy or policies of liability insurance including commercial general liability insurance with a combined single limit, or the equivalent, of not less than \$2,000,000 (two million dollars) per occurrence for Bodily Injury, Death, and Property Damage.
 - 1.2.1 The insurance required in this Subsection 1.2 shall include the following coverages:
 - Comprehensive General or Commercial General Liability, including personal injury, contractual liability, and products/completed operations coverage; and
 - Automobile Liability.
 - 1.2.2 Each policy of such insurance shall be on an "occurrence" and not a "claims made" form, and shall:
 - Name as additional insured "the City of Ashland, Oregon, its officers, agents and employees" with respect to claims arising out of the provision of Work under this Agreement;
 - Apply to each named and additional named insured as though a separate policy had been issued to each, provided that the policy limits shall not be increased thereby;
 - Apply as primary coverage for each additional named insured except to the extent that two or more such policies are intended to "layer" coverage and, taken together, they provide total coverage from the first dollar of liability;
 - Provider shall immediately notify the City of any change in insurance coverage
 - Provider shall supply an endorsement naming the City, its officers, employees and agents as additional insureds by the Effective Date of this Agreement; and

- Be evidenced by a certificate or certificates of such insurance approved by the City.
- 1.3 Provider shall obtain and maintain during the term of this Agreement and until City's final acceptance of all Work received hereunder, Professional Liability insurance with a combined single limit, or the equivalent, of not less than \$2,000,000 (two million dollars) per occurrence to cover any damages caused by error, omission or negligent acts related to the professional services to be provided under this Agreement.
 - 1.4 All subject employers working under this Agreement are either employers that will comply with ORS 656.017 or employers that are exempt under ORS 656.126. As evidence of the insurance required by this Agreement, the Provider shall furnish an acceptable insurance certificate prior to commencing any Work under this Agreement.
 - 1.5 Provider agrees that no person shall, on the grounds of race, color, religion, creed, sex, marital status, familial status or domestic partnership, national origin, age, mental or physical disability, sexual orientation, gender identity or source of income, suffer discrimination in the performance of this Agreement when employed by Provider. Provider agrees to comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations. Further, Provider agrees not to discriminate against a disadvantaged business enterprise, minority-owned business, woman-owned business, a business that a service-disabled veteran owns or an emerging small business enterprise certified under ORS 200.055, in awarding subcontracts as required by ORS 279A.110.
 - 1.6 In all solicitations either by competitive bidding or negotiation made by Provider for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Providers of the Provider's obligations under this Agreement and Title VI of the Civil Rights Act of 1964 and other federal nondiscrimination laws.

2. CITY'S OBLIGATIONS

- 2.1 City shall pay Provider the sums as specified in the SUPPORTING DOCUMENTS, including the hourly rates for Provider's staff as set forth in Provider's 2017-2018 Billing Rate Sheet, as full compensation for the Work to be performed pursuant to this Agreement. The rates set forth in Provider's 2017-2018 Billing Rate Sheet may be subject to an annual adjustment based on the Consumer Price Index - West Region.
- 2.2 In no event shall Provider's total of all compensation and reimbursement under this Agreement exceed the sum of \$2,605,342.00 (two million six hundred and five thousand three hundred and forty-two dollars) without express, written approval from the City official whose signature appears below, or such official's successor in office. Provider expressly acknowledges that no other person has authority to order or authorize additional Work which would cause this maximum sum to be exceeded and that any authorization from the responsible official must be in writing. Provider further acknowledges that any Work delivered or expenses incurred without authorization as provided herein is done at Provider's own risk and as a volunteer without expectation of compensation or reimbursement.

3. GENERAL PROVISIONS

- 3.1 This is a non-exclusive Agreement. City is not obligated to procure any specific amount of Work from Provider and is free to procure similar types of goods and services from other providers in its sole discretion.
- 3.2 Provider is an independent contractor and not an employee or agent of the City for any purpose.

- 3.3 Provider is not entitled to, and expressly waives all claims to City benefits such as health and disability insurance, paid leave, and retirement.
- 3.4 This Agreement embodies the full and complete understanding of the parties respecting the subject matter hereof. It supersedes all prior agreements, negotiations, and representations between the parties, whether written or oral.
- 3.5 This Agreement may be amended only by written instrument executed with the same formalities as this Agreement.
- 3.6 The following laws of the State of Oregon are hereby incorporated by reference into this Agreement: ORS 279B.220, 279B.230 and 279B.235.
- 3.7 This Agreement shall be governed by the laws of the State of Oregon without regard to conflict of laws principles. Exclusive venue for litigation of any action arising under this Agreement shall be in the Circuit Court of the State of Oregon for Jackson County unless exclusive jurisdiction is in federal court, in which case exclusive venue shall be in the federal district court for the district of Oregon. Each party expressly waives any and all rights to maintain an action under this Agreement in any other venue, and expressly consents that, upon motion of the other party, any case may be dismissed or its venue transferred, as appropriate, so as to effectuate this choice of venue.
- 3.8 Provider shall defend, save, hold harmless and indemnify the City and its officers, employees and agents from and against any and all claims, suits, actions, losses, damages, liabilities, costs, and expenses of any nature resulting from, arising out of, or relating to the activities of Provider or its officers, employees, contractors, or agents under this Agreement.
- 3.9 Neither party to this Agreement shall hold the other responsible for damages or delay in performance caused by acts of God, strikes, lockouts, accidents, or other events beyond the control of the other or the other's officers, employees or agents.
- 3.10 If any provision of this Agreement is found by a court of competent jurisdiction to be unenforceable, such provision shall not affect the other provisions, but such unenforceable provision shall be deemed modified to the extent necessary to render it enforceable, preserving to the fullest extent permitted the intent of Provider and the City set forth in this Agreement.
- 3.11 Deliveries will be F.O.B destination. Provider shall pay all transportation and handling charges for the Goods. Provider is responsible and liable for loss or damage until final inspection and acceptance of the Goods by the City. Provider remains liable for latent defects, fraud, and warranties.
- 3.12 The City may inspect and test the Goods. The City may reject non-conforming Goods and require Provider to correct them without charge or deliver them at a reduced price, as negotiated. If Provider does not cure any defects within a reasonable time, the City may reject the Goods and cancel this Agreement in whole or in part. This paragraph does not affect or limit the City's rights, including its rights under the Uniform Commercial Code, ORS Chapter 72 (UCC).
- 3.13 Provider represents and warrants that the Goods are new, current, and fully warranted by the manufacturer. Delivered Goods will comply with SUPPORTING DOCUMENTS and be free from defects in labor, material and manufacture. Provider shall transfer all warranties to the City.

4. SUPPORTING DOCUMENTS

4.1 The following documents are, by this reference, expressly incorporated into this Agreement and are collectively referred to in this Agreement as the "SUPPORTING DOCUMENTS:"

- The City of Ashland Water Quality Trading Plan
- Provider's complete written Proposed Second Scope of Work for the City of Ashland for "Water Quality Temperature Trading Program – Phase II" dated June 14, 2019.
- Provider's 2017-2018 Billing Rate Sheet
- Provider's complete written Proposed Scope of Work for the City of Ashland for "Water Quality Temperature Trading Program Partnership" dated August 21, 2018

4.2 This Agreement and the SUPPORTING DOCUMENTS shall be construed to be mutually complimentary and supplementary wherever possible. In the event of a conflict which cannot be so resolved, the provisions of this Agreement itself shall control over any conflicting provisions in any of the SUPPORTING DOCUMENTS. In the event of conflict between provisions of two of the SUPPORTING DOCUMENTS, the several supporting documents shall be given precedence in the order listed in Subsection 4.1. above.

5. REMEDIES

5.1 In the event Provider is in default of this Agreement, City may, at its option, pursue any or all of the remedies available to it under this Agreement and at law or in equity, including, but not limited to:

5.1.1 Termination of this Agreement;

5.1.2 Withholding all monies due for the Work that Provider has failed to deliver within any scheduled completion dates or any Work that have been delivered inadequately or defectively;

5.1.3 Initiation of an action or proceeding for damages, specific performance, or declaratory or injunctive relief;

5.1.4 These remedies are cumulative to the extent the remedies are not inconsistent, and City may pursue any remedy or remedies singly, collectively, successively or in any order whatsoever.

5.2 In no event shall City be liable to Provider for any expenses related to termination of this Agreement or for anticipated profits. If previous amounts paid to Provider exceed the amount due, Provider shall pay immediately any excess to City upon written demand provided.

6. TERM AND TERMINATION

6.1 Term

This Agreement shall be effective from the date of execution on behalf of the City as set forth below (the "Effective Date"), and shall continue in full force and effect until June 30, 2025, unless sooner terminated as provided in Subsection 6.2.

6.2 Termination

6.2.1 The City and Provider may terminate this Agreement by mutual agreement at any time.

6.2.2 The City may, upon not less than thirty (30) days' prior written notice, terminate this Agreement for any reason deemed appropriate in its sole discretion.

6.2.3 Either party may terminate this Agreement, with cause, by not less than fourteen (14) days' prior written notice if the cause is not cured within that fourteen (14) day period after written notice. Such termination is in addition to and not in lieu of any other remedy at law or equity.

7. NOTICE

Whenever notice is required or permitted to be given under this Agreement, such notice shall be given in writing to the other party by personal delivery, by sending via a reputable commercial overnight courier, or

by mailing using registered or certified United States mail, return receipt requested, postage prepaid, to the address set forth below:

If to the City:

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

With a copy to:

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

If to Provider:

The Freshwater Trust
Attn: Tim Wiggington
700 SW Taylor, Suite 200
Portland, Oregon 97205

Any notice given shall be effective as follows: upon receipt if given by personal delivery; five (5) business days after depositing with a commercial overnight courier if given by courier; or five (5) business days after mailing if mailed using registered or certified United States mail.

8. WAIVER OF BREACH

One or more waivers or failures to object by either party to the other’s breach of any provision, term, condition, or covenant contained in this Agreement shall not be construed as a waiver of any subsequent breach, whether or not of the same nature.

9. PROVIDER’S COMPLIANCE WITH TAX LAWS

9.1 Provider represents and warrants to the City that:

9.1.1 Provider shall, throughout the term of this Agreement, including any extensions hereof, comply with:

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

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

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

9.2 Provider's failure to comply with the tax laws of the State of Oregon and all applicable tax laws of any political subdivision of the State of Oregon shall constitute a material breach of this Agreement. Further, any violation of Provider's warranty, as set forth in this Section 9, shall constitute a material breach of this Agreement. Any material breach of this Agreement shall entitle the City to terminate this Agreement and to seek damages and any other relief available under this Agreement, at law, or in equity.

10. DEQ PERFORMANCE STANDARDS

The CITY OF ASHLAND WATER QUALITY TRADING PLAN, dated March 9, 2019, which sets forth performance standards approved by DEQ for riparian improvements and temperature credits, is attached to this Agreement as Exhibit B and incorporated herein by this reference. Provider shall comply with all standards set forth in the CITY OF ASHLAND WATER QUALITY TRADING PLAN when performing any Work pursuant to this Agreement.

IN WITNESS WHEREOF the parties have caused this Agreement to be signed in their respective names by their duly authorized representatives as of the dates set forth below.

CITY OF ASHLAND:

THE FRESHWATER TRUST (PROVIDER):

By: _____
City Administrator

By: _____
Signature

Printed Name

Printed Name

Date

Title

Date

Purchase Order No. _____

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

APPROVED AS TO FORM:

Assistant City Attorney

Date



SUPPORTING DOCUMENT

Water Quality Temperature Trading Program – Phase II

PROPOSED Second Scope of Work for the City of Ashland

June 14, 2019

Introduction:

The City of Ashland (the City) selected The Freshwater Trust (TFT) as its partner to develop and implement a water quality trading program for temperature compliance with the Clean Water Act. The City's Water Quality Trading Plan, which has been accepted by the Oregon Department of Environmental Quality (DEQ) as consistent with Oregon's Water Quality Trading Rule, will focus on implementing riparian revegetation projects to generate credits to satisfy the City's expected upcoming temperature obligation. Originally, TFT anticipated that this program would consist of three contract phases: 1) program design (Phase I), 2) research/demonstration project implementation (Phase II), and 3) full program implementation (Phase III). After working through Phase I activities, and in consideration of new information learned during this period, TFT and the City have adjusted their approach for later phases.

As part of its Phase I deliverables, TFT projected an overall program cost for the City's full water quality trading program. This total covers the entire projected 25-year program period (all credits have a 20-year compliance lifetime and TFT projects a 5-year implementation (planting and plant establishment) window, which results in a 25-year program). To align with the City's capital improvement project (CIP) planning process, the City requested that TFT break this total into three periods: (1) the first six program years, which aligns with the City's Public Works CIP "capital" planning phase and where the majority of State Revolving Fund (SRF) loan-eligible capital expenses will be incurred; (2) the remaining fourteen years of the City's 20-year capital planning period; and (3) the five anticipated program years that will fall outside of the City's 20-year capital planning period.

TFT projected a total program cost for the full program of \$4,584,962 (2019 \$), with \$2,605,342 in the first 6-year program period, \$1,717,006 in the next 14-year period, and \$262,614 over the final 5-year period. This second scope of work covers the first 6-year period, which will afford the City and TFT an opportunity to assess progress and actual costs incurred prior to initiating the second 14-year period. In addition, because this scope covers the full anticipated implementation window, it will not force TFT to arbitrarily estimate what projects will be implemented when. Through use of its prioritization and optimization tools, TFT hopes to deliver the program for less than the estimated

total, but proposes to establish contractual not to exceed amounts associated with the more conservative estimate.

Phase 2: Riparian Research Project Implementation

Up to 6 years after commencement of Phase 2

A. WQT project site recruitment, implementation, stewardship & credit cycle:

- 1. Site recruitment:** TFT will select, recruit, and secure site protection agreements from private landowners within the Bear Creek watershed. In doing so, TFT will pursue projects that produce comparatively cost-effective credits, and that align with the City's desire to keep projects as close to the City as possible. TFT will closely coordinate with the City to stay aligned on priorities, understanding that the City's ability to approve projects on City-owned lands will be an important variable in determining how many projects can be implemented within or close to City limits.
- 2. Site implementation, stewardship & credit cycle management:** TFT will prep and implement privately owned sites consistent with the Trading Plan, calculate credits, and ensure all proper credit cycle documentation is completed. TFT will perform monitoring and stewardship activities, including plant establishment, on these sites through program year six (6). TFT will also support the City in implementing and stewarding WQT projects on City-owned land. TFT will undertake all of these activities in a way that maximizes SRF funding reimbursement.

B. Stakeholder outreach: Buy-in from local partners and landowners is key to program success. TFT will coordinate with the City to identify key stakeholders, communicate with those stakeholders, and develop and implement a coordinated outreach strategy for the program.

Task Estimate: \$24,700 (160 hours).

C. Permit support: TFT will support the City in its permit negotiations with DEQ. Potential activities include amendments/adjustments to the Trading Plan, proper reference and incorporation of trading into the City's NPDES permit, compliance schedule development and justification, and incorporation of pre-permit trading sites into post-permit compliance sites.

Task Estimate: \$37,275 (285 hours).

Deliverables:

1. TFT will recruit, implement, and steward all necessary private land credit projects in the Bear Creek watershed. TFT will implement and manage all mutually agreed aspects of City-owned sites. Volume, timing and location of project sites will be dependent on the number of City-owned sites that move forward and landowner interest. TFT will ensure that all credit project sites have been secured and implemented by the end of Phase 2.
2. Outreach strategy summary.
3. As needed permit support.

Phase 2 Not-to-Exceed Amount: This total includes:

- \$2,605,342 for all WQT project expenses over the first six program years

- \$24,700 for stakeholder outreach
- \$37,275 for permit support

Suggested Meetings:

- The exact meeting schedule will be determined after contracting, but TFT proposes participation in an in-person kickoff with the City at the beginning of this Scope of Work.
- The Trust expects to lead conference calls and in-person meetings with the City as needed to adequately resource this innovative and complex partnership.

Anticipated Timeline:

Program Year	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6			
Quarters	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Task A																								
Task B																								
Task C																								

Conclusion:

TFT has proposed this Scope of Work based on its deep experience developing temperature credit trading programs for Clean Water Act compliance in Oregon, and in particular in the Rogue River Basin. At the conclusion of this Scope, all project sites will have been implemented.

Contact for next steps:

TFT looks forward to working with the City. Please direct questions, comments and additions to:

Tim Wigington
 Attorney & Finance Director
 503-222-9091 x41
 tim@thefreshwatertrust.org

Eugene Wier
 Habitat Restoration Project Manager
 541-708-0934
 541-227-9858
 eugene@thefreshwatertrust.org



Oregon

Kate Brown, Governor

Department of Environmental Quality

Western Region Eugene Office

165 East 7th Avenue, Suite 100

Eugene, OR 97401-3049

(541) 686-7838

FAX (541) 686-7551

TTY 711

March 9, 2018

Paula C. Brown, PE
City of Ashland Public Works Dept.
20 East Main Street
Ashland OR 97520

RE: Water Quality Trading Plan and Performance Standards for Riparian Restoration
Ashland Wastewater Treatment Plant
WQ file #3780; NPDES permit #101609
Jackson County

Dear Ms. Brown:

Thank you for resubmitting the City of Ashland's *Trading Plan and Performance Standards for Riparian Restoration*. The March 7, 2018 revised plan contains all of the required elements in OAR 340-039-0025 and adequately addresses DEQ's December 19, 2017 comments.

Next Steps

Ashland may *generate* water quality trading credits at this time. Ashland may *use* credits after the trading plan is incorporated into the city's permit. DEQ is committed to drafting a renewal permit with trading provisions. As a reminder, DEQ must provide an opportunity for public notice and comment on the trading plan during permit renewal. As you are aware, DEQ cannot guarantee the contents of the issued permit due to public participation requirements.

We appreciate and support the city's proactive approach in generating thermal credits and improving the environment. We look forward to working collaboratively with the city on this project and the permit renewal.

If you have any questions, please contact Wade Peerman 503-229-5046 at or Jon Gasik at 541-776-6242. I may also be reached at 503-378-5081.

Sincerely,

Ranei Nomura
Water Quality Manager
DEQ Western Region

RN:jg:wp

cc: Scott Fleury, City of Ashland
Wade Peerman, ODEQ Northwest Region Office
Jon Gasik, ODEQ Medford Office
cc: ODEQ Medford Office Facility Files



CITY OF ASHLAND WATER QUALITY TRADING PLAN

Regulatory Background Supporting Trading in Oregon

Over the last fifteen years, Oregon has led other states in utilizing innovative methods such as water quality trading to comply with the Clean Water Act (CWA). In 2001, the Oregon Legislature directed the Oregon Department of Environmental Quality (DEQ) to develop a water quality trading program in the Willamette River.¹ In 2003, the U.S. Environmental Protection Agency (EPA) also published its water quality trading policy (2003 EPA Trading Policy), which describes how point and nonpoint sources can participate in market-based approaches to meet water quality standards at a reduced cost. This policy supports water quality trading as a flexible approach to achieving water quality and environmental benefits that would otherwise not be attained under traditional regulatory approaches. The 2003 EPA Trading Policy explicitly endorsed trading for nutrients and sediment loads, and noted that other constituents can likely be traded if the trades have “the potential to improve water quality and achieve ancillary environmental benefits.”²

Following the 2003 EPA Trading Policy, in 2004, DEQ issued a permit to Clean Water Services (CWS) that allowed for trading of thermal credits generated from riparian shade projects to assist two publicly owned treatment works (POTWs) in achieving NPDES permit compliance, and that allowed for the POTWs to generate thermal credits by releasing cold water from an upstream reservoir in order to satisfy the permittee’s thermal obligation. Based on this applied experience, in 2007 and again in 2009, DEQ developed an Internal Management Directive (IMD) meant to help agency staff structure trades in NPDES permits. This expanded guidance coincided with additional guidance from EPA, including a 2007 toolkit for permit writers. In 2011, DEQ issued a permit to the City of Medford that allows for thermal trading between Medford’s POTW and nonpoint sources that create thermal credits through riparian shade projects.

After ten years of experience with trading in the state, DEQ sought to formalize the lessons learned on trading. In 2013, EPA Region 10 joined water quality staff from Oregon, Idaho, and Washington, as well as other stakeholders, in a series of interagency workshops to study the existing water quality trading policies, practices, and programs from across the nation. The ultimate goal of this “Joint Regional Recommendations on Water Quality Trading” (JRR) undertaking was to build on lessons from other trading programs and make recommendations that would ensure future trading programs had “the quality, credibility, and transparency necessary to be consistent with the Clean Water Act.” The end result of this endeavor was a non-binding recommendations document meant to help foster the efficient and consistent development of robust trading programs in the region.³ This effort was then taken to the national level through the “National Network on Water Quality Trading”, which ultimately produced an “Options and Considerations” document outlining the major items to consider when developing a trading program.⁴

Based in large part on the knowledge gained from these experiences, Oregon began crafting water quality trading regulations in 2014. In December 2015, after a year of comprehensive deliberation and stakeholder engagement, the Oregon Environmental Quality Commission (EQC) unanimously approved water quality trading rules (OAR 340 Division 039), which clarified the basic requirements of a viable trading program in Oregon. In March 2016, shortly after the EQC adopted the water quality trading rules, DEQ updated its IMD to complement the management directive and the changes brought about by the new rules. The following trading plan proposal for the City of Ashland is consistent with the rules and the intent of the updated 2016 water quality trading IMD.

¹ OR. REV. STAT. § 468B.555

² U.S. EPA, Water Quality Trading Policy, 68 Fed. Reg. 1608, 1610 (Jan. 13, 2003), *available at* <https://www.gpo.gov/fdsys/pkg/FR-2003-01-13/html/03-620.htm>.

³ Willamette Partnership & The Freshwater Trust, Draft Regional Recommendations for the Pacific Northwest on Water Quality Trading (2014), *available at* <http://willamettepartnership.org/our-stories/regional-recommendations-water-quality-trading/>.

⁴ National Network on Water Quality Trading, Building a Water Quality Trading Program: Options and Considerations (2015), *available at* <http://willamettepartnership.org/wp-content/uploads/2015/06/BuildingaWQTPProgram-NNWQT.pdf>.

Consistency with Water Quality Trading Purpose and Policy

OAR 340-039-0001: PURPOSE AND POLICY

“(1) Purpose. This rule implements ORS 468B.555 to allow entities regulated under the Clean Water Act to meet pollution control requirements through water quality trading. This rule establishes the requirements for water quality trading in Oregon. (2) Policy. The Oregon Department of Environmental Quality may approve water quality trading only if it promotes one or more of the following Environmental Quality Commission policies: (a) Achieves pollutant reductions and progress towards meeting water quality standards; (b) Reduces the cost of implementing Total Maximum Daily Loads (TMDLs); (c) Establishes incentives for voluntary pollutant reductions from point and nonpoint sources within a watershed; (d) Offsets new or increased discharges resulting from growth; (e) Secures long-term improvement in water quality; or (f) Results in demonstrable benefits to water quality or designated uses the water quality standards are intended to protect.”

Ashland’s water quality trading plan is consistent with several EQC policies articulated in the rule. Ashland’s trading plan helps to establish voluntary incentives for nonpoint sources to reduce thermal loading within the Bear Creek watershed.⁵ In addition, unlike traditional technological solutions for treatment facilities, the restoration investment underlying Ashland’s water quality trading program will appreciate over time into a self-sustaining solution,⁶ which helps secure long-term improvements in water quality. Moreover, in addition to creating cooler, shaded spaces in the river for fish, Ashland’s trading solution will directly advantage beneficial uses in the watershed by supporting the recruitment of large wood that supports salmonid spawning, rearing and migration habitat.⁷ In addition to these benefits, Ashland’s trading plan is also likely to improve functional habitat for macro-invertebrate life, provide year-round shading of the waterbody (beyond the time periods when the restored ecosystem will provide shade credits), help minimize nutrient inputs, result in some floodplain restoration, and help control erosion.⁸

In addition to promoting several of the EQC policies articulated in the rule, Ashland’s trading solution will likely help to foster a sustainable local economy.⁹ Riparian plantings require a local workforce (excavators, operators, equipment suppliers, contractors, and maintenance and restoration professionals), plant stock and supplies are typically purchased from local nurseries, and project site leases provide an important income stream to local landowners. On average, 62 cents of every dollar spent on restoration has been shown to stay in the local rural economy, and every \$1 million spent on riparian restoration creates approximately 23 jobs.¹⁰ In addition, trading yields energy use savings compared to technological solutions that require energy to operate—which reduces the release of airborne greenhouse gas pollutants and also aligns with Ashland’s climate mitigation and adaptation goals.¹¹

⁵ Ashland expects that some portion of its projects will be installed on private nonpoint source land. Ashland envisions that those landowners will be incentivized to participate in the program through financial mechanisms, including lease payments.

⁶ The solution is “self-sustaining” because, for example, when a mature tree naturally falls (itself an ecosystem-benefiting event), riparian vegetation and/or another tree will naturally grow in its place, thus allowing the solution to function even in the absence of human intervention—something that is not possible for built solutions that require maintenance to function over time.

⁷ Montgomery, D. R., Collins, B. D., Buffington, J. M., & Abbe, T. B. Geomorphic effects of wood in rivers, 37 *Ecology and Management of Wood in World Rivers*, 21–47 (2003).

⁸ See M.D. Tomer & M.A. Locke, *The Challenge of Documenting Water Quality Benefits of Conservation Practices: A Review of USDA-ARS’s Conservation Effects Assessment Project Watershed Studies*, 64 *WATER SCIENCE & TECHNOLOGY* 300, 303 (2011) (noting nutrient and erosion benefits of buffers); Scott W. Miller et al., *Quantifying Macroinvertebrate Responses to In-Stream Habitat Restoration: Applications of Meta-Analysis to River Restoration*, 18 *RESTORATION ECOLOGY* 8, 8 (2010) (noting benefits of heterogeneous riparian habitat).

⁹ CITY OF ASHLAND, CLIMATE & ENERGY ACTION PLAN (Jan. 2017).

¹⁰ Nielsen-Pincus, M., & Moseley, C. The Economic and Employment Impacts of Forest and Watershed Restoration. 21(2) *Restoration Ecology*, 207–214, 212 (2013).

¹¹ CITY OF ASHLAND, CLIMATE & ENERGY ACTION PLAN (Jan. 2017). In addition to reducing greenhouse gas emissions, restoration advances the City’s goals of becoming carbon neutral and increasing the local ecosystem’s resiliency to climate change. See also CITY OF ASHLAND, FINAL COMPREHENSIVE WATER MASTER PLAN (Apr. 2012).

Consistency with Water Quality Trading Objectives

OAR 340-039-0003: WATER QUALITY TRADING OBJECTIVES

“Water quality trading authorized under this rule must: (1) Be consistent with anti-degradation policies; (2) Not cause or contribute to an exceedance of water quality standards; (3) Be consistent with local, state, and federal water quality laws; (4) Be designed to result in a net reduction of pollutants from participating sources in the trading area; (5) Be designed to assist the state in attaining or maintaining water quality standards; (6) Be designed to assist in implementing TMDLs when applicable; (7) Be based on transparent and practical Best Management Practices (BMPs) quality standards to ensure that water quality benefits and credits are generated as planned; and (8) Not create localized adverse impacts on water quality and existing and designated beneficial uses.”

(1, 2, 4) Anti-degradation & Net Reduction in Pollutant Loading: Oregon's anti-degradation policy is found in OAR 340-041-0004. As stated in the 2016 Oregon water quality trading IMD, Oregon’s anti-degradation policy generally prohibits the lowering of existing water quality.¹² In the 2003 EPA Trading Policy, EPA states that it "does not believe that trades and trading programs will result in 'lower water quality' as that term is used in 40 CFR § 131.12(a)(2) ... when the trades or trading programs achieve a no net increase of the pollutant traded and do not result in any impairment of designated uses."¹³ In line with the 2003 EPA Trading Policy, the 2016 water quality trading IMD instructs DEQ staff to ensure that trades are designed to result in a net reduction of pollutants in the trading area as required in OAR 340-039-0003(4). In addition to ensuring this outcome, as described in the next subsection, it will be necessary to avoid localized impacts to designated uses.

(8) Avoidance of Localized Impacts on Fish: The cold water protection criteria in the Oregon water quality standards restricts the amount of warming above ambient conditions during spawning use periods. Because threatened salmonid species inhabit Bear Creek and the water body is designated as critical habitat, the cold water protection criteria in OAR 340-041-0028(11) apply. According to the 2008 DEQ Temperature Water Quality Standard Implementation IMD, the cold water protection criteria must be met at the location of the nearest physical spawning habitat downstream of the outfall, not at the edge of the mixing zone.¹⁴ With the proposed relocated outfall into Bear Creek, complete mixing with the receiving stream flow is expected before the thermal plume reaches downstream spawning areas.¹⁵

Moreover, DEQ can only approve Ashland’s potential trading program¹⁶ if Ashland’s discharge does not cause thermal plume impacts on salmonids prohibited under OAR 340-041-0053(2)(d).¹⁷ According to draft analysis completed by CH2M Hill, Ashland’s discharge has the reasonable potential to violate the spawning impairment portion of the thermal plume regulations.¹⁸ Even with the proposed outfall relocation, CH2M determined that there is a reasonable potential for Ashland’s discharge to still exceed the spawning impairment thermal plume

¹² Or. Dep’t of Env’tl. Quality, Water Quality Trading Internal Management Directive, at 9 (updated Mar. 31, 2016), *available at* <http://www.deq.state.or.us/wq/pubs/imds/WQTradingIMD.pdf>.

¹³ Trading IMD, at 9 (quoting U.S. EPA, Water Quality Trading Policy, 68 Fed. Reg. at 1611).

¹⁴ Or. Dep’t of Env’tl. Quality, Temperature Water Quality Standard Implementation – A DEQ Internal Management Directive, § 3.8 (2008), *available at* <http://www.deq.state.or.us/wq/pubs/imds/Temperature.pdf>.

¹⁵ CH2M Hill, Ashland WWTP Outfall Relocation Study, Section 4.4.3 (August 2017).

¹⁶ See OR. ADMIN. RULES 340-039-0003(5)-(6).

¹⁷ “Temperature mixing zones and effluent limits authorized under 340-041-0028(12)(b) will be established to prevent or minimize the following adverse effects to salmonids inside the mixing zone: (A) Impairment of an active salmonid spawning area where spawning redds are located or likely to be located. This adverse effect is prevented or minimized by limiting potential fish exposure to temperatures of 13 degrees Celsius (55.4 Fahrenheit) or more for salmon and steelhead, and 9 degrees Celsius (48 degrees Fahrenheit) or more for bull trout; (B) Acute impairment or instantaneous lethality is prevented or minimized by limiting potential fish exposure to temperatures of 32.0 degrees Celsius (89.6 degrees Fahrenheit) or more to less than 2 seconds; (C) Thermal shock caused by a sudden increase in water temperature is prevented or minimized by limiting potential fish exposure to temperatures of 25.0 degrees Celsius (77.0 degrees Fahrenheit) or more to less than 5 percent of the cross section of 100 percent of the 7Q10 low flow of the water body; the Department may develop additional exposure timing restrictions to prevent thermal shock; and (D) Unless the ambient temperature is 21.0 degrees or greater, migration blockage is prevented or minimized by limiting potential fish exposure to temperatures of 21.0 degrees Celsius (69.8 degrees Fahrenheit) or more to less than 25 percent of the cross section of 100 percent of the 7Q10 low flow of the water body.”

¹⁸ CH2M Hill, Ashland WWTP Outfall Relocation Study, Section 4.4.3 (August 2017).

regulation at the beginning and end of spawning period under current operations.¹⁹ As such, in order to comply with these regulations and as a prerequisite for engaging in temperature trading as part of its compliance portfolio, Ashland must address this potential projected near-field thermal exceedance through either direct effluent cooling or effluent flow diversion away from the receiving stream. Ashland has evaluated a wide range of options for meeting expected temperature limits in its next NPDES permit, including relocation of the City's WWTP outfall from Ashland Creek to Bear Creek, treatment wetlands, time-appropriate cold water reservoir releases, and effluent dispersion. Ashland intends to utilize some combination of these near-field actions to satisfy the anticipated thermal plume regulations and can then use riparian shade projects to fulfill the portion of its permit obligation remaining after completing near-field improvements.²⁰

(3) Consistent with local, state, and federal water quality laws: The proposed trading program is consistent with Oregon's anti-degradation policy, localized impact regulations, the Bear Creek watershed temperature TMDL, baseline regulations (described in detail later in this proposal), and the Oregon trading rule. In addition, all project work will be completed in accordance with applicable local, state, tribal and federal permit requirements. When the trading plan is incorporated into Ashland's NPDES permit, the expectation is that it will be done so consistent with the Clean Water Act.

(5,6) Designed to Assist State in Attaining Water Quality Standards and Implementing a TMDL: The 2007 Bear Creek watershed temperature TMDL allocated Ashland a wasteload allocation (WLA) of 0.1°C above the applicable criteria in Ashland Creek as well as at the point of maximum impact.²¹ Ashland expects its discharge to exceed its thermal WLA (as well as its thermal load limit, once it has a thermal limit in a renewed NPDES permit). Ashland plans to rely on trading, among several other solutions, to address its thermal WLA exceedance. Therefore, trading is designed to assist Oregon in implementing the Bear Creek temperature TMDL, which outlines the informational pathway to attaining temperature water quality standards.²²

(7) Based on transparent and practical BMPs quality standards: The proposed BMP quality standards are described later in this proposed trading plan.

¹⁹ CH2M Hill, Ashland WWTP Outfall Relocation Study, Section 4.4.3 (August 2017).

²⁰ Pre-permit shade projects will in no way violate cold water criteria or thermal plume regulations. Therefore, this regulatory cluster will not apply to the City until Ashland receives a thermal limit in its NPDES permit, and the trading plan is incorporated into its permit.

²¹ Or. Dep't of Env'tl. Quality, Bear Creek Watershed Total Maximum Daily Load, Section 2, Temperature TMDL, at 46 (2007).

²² TMDLs are "primarily informational tools" that "serve as a link in an implementation chain that includes federally regulated point source controls, state or local plans for point and nonpoint source pollutant reduction, and assessment of the impact of such measures on water quality, all to the end of attaining water quality goals for the nation's waters." *Pronsolino v. Nastri*, 291 F.3d 1123, 1129 (9th Cir. 2002).

Eligibility

OAR 340-039-0015: ELIGIBILITY

Ashland is eligible to trade as a NPDES permit holder.²³ As described in the following trading plan section, Ashland's proposed temperature trade is eligible.²⁴ The Bear Creek watershed is water quality limited for temperature issues related to the salmonid life cycle,²⁵ and so is an eligible waterbody where trading may occur. As described in the Proposed Trading Plan section of this document, the BMP proposed by Ashland for credit generation is quantifiable and have BMP quality standards.²⁶

Proposed Trading Plan

The following subsections describe how Ashland's proposed trading plan aligns with each of the required components of a trading plan, as described in OAR 340-039-0025(5). To better assist in explaining how these components fit together, this proposal describes some of the -0025(5) requirements out of order.

OAR 340-039-0025(5)(A): TEMPERATURE TRADING

Pursuant to the trading rule, a trading plan must identify "the parameter for which water quality trading is proposed." The trading rule authorizes trading for temperature.²⁷ Ashland's trading plan is designed to help meet its temperature reduction obligation.

OAR 340-039-0025(5)(C): TRADING AREA

Pursuant to the trading rule, a trading plan must include a "description of the trading area including identification of the location of the discharge to be offset, its downstream point of impact, if applicable, where trading projects are expected to be implemented, and the relationship of the trading projects to beneficial uses in the trading area." Trades should occur within the same watershed or area covered by a TMDL to ensure that the benefits of trades affect the same waterbody where the discharge is occurring.²⁸ A trading area must encompass "a watershed or other hydrologically-connected geographic area, as defined within a water quality management plan adopted for a TMDL, trading framework or trading plan. A trading area must encompass the location of the discharge to be offset, or its downstream point of impact, if applicable, and the trading project to be implemented."²⁹ Trading areas must also be consistent with TMDL water quality management plans (WQMP), where they exist.³⁰ Trading areas may be established in water quality trading frameworks.³¹

In summary, Oregon rules require that a trading area: 1) identify the location of discharge to be offset, 2) identify a downstream point of impact (if applicable), and 3) describe the relationship between trading projects and beneficial uses. In addition, the trading area 4) must encompass a watershed or other hydrologically-connected geographic area, as defined within a water quality management plan adopted for a TMDL, trading framework or trading plan, and 5) must also be consistent with TMDL water quality management plans (WQMP), where they exist. Consistent with these requirements, Ashland therefore proposes a trading area focused on the upper Bear Creek watershed, above Bear Creek river mile 4.

Ashland's proposed trading area would encompass Ashland's discharge and the point of maximum impact identified by DEQ in the Bear Creek temperature TMDL.³² The proposed trading area also has a strong relationship between trading projects and beneficial uses in the watershed. Because the Bear Creek watershed

²³ OR. ADMIN. RULES 340-039-0015(1).

²⁴ OR. ADMIN. RULES 340-039-0015(2).

²⁵ Or. Dep't of Env'tl. Quality, Integrated Report (2012), *available at* <http://www.deq.state.or.us/wq/assessment/rpt2012/results.asp>.

²⁶ See sections in proposed trading plan on OAR 340-039-0025(5)(d), (f).

²⁷ OR. ADMIN. RULES 340-039-0015(2)(a).

²⁸ U.S. EPA, Water Quality Trading Policy, 68 Fed. Reg. at 1610. OAR 340-039-0040(1).

²⁹ OR. ADMIN. RULES 340-039-0005(5).

³⁰ OR. ADMIN. RULES 340-039-0035(2) (trading areas must be consistent with any applicable TMDL water quality management plan).

³¹ OR. ADMIN. RULES 340-039-0035(1).

³² Or. Dep't of Env'tl. Quality, Bear Creek Watershed TMDL, Section II: temperature, at 45, fig. 11 and 12 (2007).

is listed for temperature impairments related to cold-water species life stages,³³ riparian revegetation trading projects such as those proposed by Ashland would be directly linked to improving conditions for temperature-based beneficial uses. The trading area covers the watershed/hydrologically connected area covered by the current Oregon temperature TMDL for the Bear Creek subbasin. This proposed trading area is also consistent with the Bear Creek TMDL water quality management plan (WQMP): the Bear Creek TMDL WQMP³⁴ speaks to better management of riparian areas, as well as habitat improvement for salmonids—both of which will be affirmatively addressed in Ashland’s trading plan. Additionally, a focus on the upper Bear Creek watershed will help Ashland pursue more projects closer to city limits.

OAR 340-039-0025(5)(D): BMPS

Pursuant to the trading rule, a trading plan must include a “description of the water quality benefits that will be generated, the BMPs that will be used to generate water quality benefits, and applicable BMP quality standards.” A BMP is defined as “in-water or land-based conservation, enhancement or restoration actions that will reduce pollutant loading or create other water quality benefits. BMPs include, but are not limited to, structural and nonstructural controls and practices and flow augmentation.”³⁵ A BMP quality standard must include “specifications for the design, implementation, maintenance and performance tracking of a particular BMP that ensure the estimated water quality benefits of a trading project are achieved, and that allow for verification that the BMP is performing as described in an approved trading plan.”³⁶

The BMP that will be used to generate water quality benefits under Ashland’s trading plan is riparian restoration in the Bear Creek watershed trading area. Riparian restoration will block thermal loading into the Bear Creek watershed (see next subsection on Credits for more detail on the calculation methodology). The BMP quality standard proposed by Ashland for riparian restoration projects will include the following components:

- Sites will be designed, implemented, monitored, verified and tracked consistent with Willamette Partnership February 16, 2016 Performance Standards for Riparian Revegetation (Exhibit A to this proposed trading plan).³⁷ Sites will be legally protected for the duration of the credit project life (e.g., private leases, or appropriate encumbrances if on publicly owned land).
- In accordance with maintenance plans developed at the outset of credit projects, sites will be visited regularly for maintenance, especially in early “establishment” years. During site establishment, minimum maintenance on most sites will usually include one spring ring spray, one summer mow or cut and one fall spot spray. In irrigated riparian areas, with water rights, irrigation may be an appropriate option during the first several years. Inter-planting may also be needed. Once a site has become established, maintenance activities will continue, but will likely occur at less frequent intervals.
- Details on the performance tracking and verification aspects of Ashland’s proposed BMP quality standards are described below in the subsections corresponding with OAR 340-039-0025(5)(G) verification, and (H) tracking/reporting.

OAR 340-039-0025(5)(F): CREDITS

Pursuant to the trading rule, a trading plan must include a “description of the credits needed to meet water quality-based requirements of an NPDES permit or 401 water quality certification, including: (A) Quantity and timing: The number of credits needed and any credit generation milestones, including a schedule for credit generation; (B) Methods used: How credits will be quantified, including the assumptions and inputs used to

³³ The proposed outfall location in Bear Creek are designated for year-round salmon and trout migration and rearing use per OAR 340-041-0028(4)(c), Figure 271A, and are designated for spawning use during October 15 through May 15 per OAR 340-041-0028(4)(a), Figure 271B.

³⁴ OR. ADMIN. RULES 340-039-0035(2) (noting that trading areas must be consistent with any applicable TMDL water quality management plan). Or. Dep’t of Env’tl. Quality, Bear Creek Watershed Total Maximum Daily Load, ch. II, Water Quality Management Plan (2007), available at <http://www.deq.state.or.us/WQ/TMDLs/docs/roguebasin/middlerogue/bearcreek/tmdlchp2wqmp.pdf>.

³⁵ OR. ADMIN. RULES 340-039-0005(1).

³⁶ OR. ADMIN. RULES 340-039-0005(2).

³⁷ Willamette Partnership, Performance Standards for Riparian Vegetation (2016), available at http://willamettepartnership.org/wp-content/uploads/2014/06/Performance-Stds-for-Rip-Reveg_2016-02-16.pdf.

derive the number of credits; and (C) Duration of credits: A description of the length of time credits are expected to be used.

Quantity and Timing: The calculation of Ashland’s likely credit need and timing is a three-step process: 1) calculate maximum projected thermal load exceedances for each period of concern in a year; 2) determine which portion of those exceedances will be addressed via trading; and 3) apply programmatic ratios.

First, Ashland must identify its maximum projected excess thermal load exceedance(s) throughout the year. A facility’s thermal exceedance is equal to: (*Facility Excess Thermal Load*) – (*Excess Thermal Load Limit*), or ETL – ETLL, where:

- **ETL** = (Flow effluent (cfs)) x (°C effluent – °C Temperature Criteria³⁸) x (Conversion Factor)
- **ETLL** = (Flow river (cfs) + Flow effluent (cfs)) x (HUA³⁹) x (Conversion Factor)

Ashland has calculated monthly exceedance values to ensure that the thermal benefits produced in that maximum projected exceedance time period are largely representative of benefits that might be generated during other lesser exceedance periods.

Second, Ashland must determine what portion of those monthly exceedances are going to be addressed by trading. Ashland is evaluating multiple potential changes to facility operations to address both near- and far-field thermal impacts. Ashland’s Outfall Relocation Study has evaluated the current and projected future thermal loads discharged from the Ashland WWTP as well as other potential options available to address projected excess thermal loads throughout the year.⁴⁰ Based on observed water temperature and flows in Bear Creek (representing monthly critical conditions), the biologically based numeric criteria, and its wasteload allocation, Ashland calculated the ETL exceedances for different time periods throughout the year based on projected 2040 facility design flows.⁴¹

A portion of these projected monthly exceedances will be addressed through near-field upgrades at or near the facility’s discharge. The Outfall Relocation Study analysis has identified actions necessary to address the facility’s near-field thermal impacts, and how dealing with those near-field impacts will change the amount of excess far-field thermal loads that need to be met via trading. Based on this evaluation, expected changes necessary to address the near-field limitations will reduce projected maximum ETL exceedances during the May 1 – May 14 and October 15 – November 14 periods (these changes to the maximum ETL excesses are noted in Table 1).

³⁸ In *Northwest Environmental Advocates v. EPA (NWEA II)*, the Oregon federal district court set aside NCC as a standard, holding that it unlawfully supplanted the BBNC in violation of 40 C.F.R. § 131.11(b)(2). *Nw. Env’tl. Advocates v. U.S. Env’tl. Protection Agency*, 855 F.Supp.2d 1199, 1217 (D. Or. 2012). Removal of the NCC from Oregon regulations leaves Oregon with the biologically based numeric criteria (BBNC) temperature standard. Therefore, the BBNC temperature criteria applicable to Bear Creek must be used to calculate Ashland’s ETL.

³⁹ OR. ADMIN. RULES 340-041-0028(12)(b)(B). DEQ regulations allow for a human use allowance (HUA) in setting temperature permit limits, providing that insignificant additions of heat are authorized by DEQ in waters that exceed the applicable temperature criteria. This addition is known as the “human use allowance” (HUA). The calculation of a HUA differs depending on whether a TMDL exists for a waterbody. The court in *NWEA II* explicitly upheld the legality of the HUA provision. 855 F.Supp.2d at 1218, note 8.

⁴⁰ CH2M Hill, Ashland WWTP Outfall Relocation Study, Section 4 (August 2017).

⁴¹ CH2M Hill, Ashland WWTP Outfall Relocation Study, Section 4, Table 4-12 (August 2017).

Table 1. Projected maximum excess thermal loads (ETL) and ETL exceedances under monthly critical conditions using 2040 design flows. The values presented in the table have been taken from the Ashland WWTP Outfall Relocation Study (Table 4-12) and adjusted based on direction from Ashland where noted to reflect the impact of the changes to effluent characteristics as a result of adjustment to meet the facility's near-field requirements.

Period	Biological Temperature Criteria (°C)	Maximum ETL (million kcal/day)	Maximum ETL Excess (million kcal/day) ⁴²
Jan 15 – Feb 14	13	0.3	N/A
Feb 15 – Mar 14	13	17.9	13.5
Mar 15 – Apr 14	13	22.0	18.1
Apr 15 – Apr 30	13	72.5	65.2*
May 1 – May 14	13	72.5	28.8**
May 15 – Jun 14	18	31.8	24.6
Jun 15 – Jul 14	18	56.4	50.7
Jul 15 – Aug 14	18	67.4	59.5
Aug 15 – Sep 14	18	68.2	65.0
Sep 15 – Oct 14	18	49.9	48.2
Oct 15 – Nov 14	13	63.0	8.4 ***
Nov 15 – Dec 14	13	44.2	41.5
Dec 15 – Jan 14	13	13.6	9.7

* Apr 15 – May 14 period split into two periods. No changes were made to the maximum ETL excess values, however, it is expected that measures used to address near-field impacts will also be used to reduce the maximum ETL excess during this period.
 ** Maximum projected ETL for this split period was reduced to reflect measures that will be implemented to meet near-field requirements.
 *** Maximum projected ETL for this period reduced to reflect measures that will be implemented to meet near-field requirements.

As noted in Table 1, there are two periods where the largest maximum ETL excesses are projected to occur: April 15 to May 14 and August 15 to September 14—both have ETL excesses of approximately 65 million kcal/day. During the April to May period, the discharge from the facility has an associated near-field impact, in addition to a far-field ETL excess. Ashland’s expected near-field actions are expected to reduce the remaining far-field ETL excess during mid-April to mid-May. The Outfall Relocation Study quantifies the reduction in the May 1-14 ETL excess (which is expected to be 28.8 million kcal/day after accounting for near-field changes), but at this time, the change to the April 15-30 ETL excess has not been quantified. Given the expected reductions in the maximum ETL excess from April 15 to May 14, and the fact that the variability in thermal benefits from riparian shade from mid-April to mid-October is low (which means that selection of one period will not significantly over- or under-represent other exceedance periods in terms of shade potential),⁴³ the period with the greatest maximum ETL excess that must be addressed through riparian shade is from August 15 to September 14 (Table

⁴² The projected maximum ETL excess shown accounts for the HUA and the direct reductions in ETL required at the point of discharge to address near-field effects. Some portion of these maximum ETL exceedances will be addressed through extending the periods of operation for measures used to address near-field impacts, such as reservoir cold water releases and effluent cooling using constructed wetlands, through additional periods needed to complement the riparian shade ETL contributions. Similar to riparian shade, the thermal benefits from these measures vary throughout the year. Accordingly, Ashland will ensure that the ETL exceedances are addressed at all times using a portfolio of solutions.

⁴³ The thermal benefits that can be generated by riparian shade varies throughout the year. As such, it is important to ensure that the thermal benefits modeled from planting projects will be generated at the same time as potential thermal impacts caused by the facility discharge. In this instance, the variability in thermal benefits from riparian shade from mid-April to mid-October is low. Based on work completed by The Freshwater Trust for Ashland, the potential thermal benefits available in the Bear Creek watershed from April 15 to May 14 are only 17% lower than in the August 15 to September 14 period. In addition, as noted in the table, Ashland expects that some or all of its projected April/May exceedance will be addressed via the actions taken to address near-field impacts.

1). As such, this represents the likely exceedance that will be addressed via Ashland’s trading plan, as well as the period for which thermal benefit values will be quantified and measured against.

Third, programmatic ratios must be applied to the maximum projected exceedance so as to identify the total credit need for that period. In this instance, 65 million kcal/day of need from riparian shade projects has been identified for the August 15 – September 14 period. As discussed below, Ashland proposes applying a temporal lag ratio to this “base” exceedance.

Methods Used: Ashland will estimate thermal benefits⁴⁴ from riparian restoration projects using version 8 of DEQ’s Shade-a-lator model. Shade-a-lator is a module of the Heat Source model,⁴⁵ a stream assessment tool used by DEQ. Heat Source was developed in 1996 as a Master’s Thesis at Oregon State University in the Departments of Bioresource Engineering and Civil Engineering. DEQ currently maintains the Heat Source methodology and software. Ashland will use an additional tool to complete the modeling: TTools. TTools is an ArcGIS extension that is also used and maintained by DEQ. TTools is used to sample geospatial data and assemble high-resolution inputs necessary to run the Heat Source model.

To determine the potential reduction in solar loading (e.g., thermal benefits) that result from riparian planting projects, Ashland will compare current site conditions⁴⁶ (the solar load that reaches the surface of the stream under current conditions) to a future conditions scenario that assumes vegetation conditions (tree height and canopy density) at maturity (described later in this subsection). The difference in the incoming solar load (expressed in kilocalories per day) between the two scenarios represents the net thermal benefits generated from a riparian revegetation project.

The modeling process for each scenario at a site will include multiple physical characteristics of the credit site, including: the upstream and downstream boundaries of the modeled stream reach, water surface area (based on the wetted width of the stream), local topography, bank slope, stream orientation, and geographic location (latitude and longitude). All of the parameters representing these physical characteristics of sites will be assumed to be the same in the current condition and future condition scenarios.

The future conditions scenario incorporates the vegetation conditions (tree height and canopy density) expected under the post-implementation conditions. Based on available information, Ashland will apply a future condition scenario for Shade-a-lator modeling to reflect the anticipated future vegetation conditions.⁴⁷ Planting plans are expected to include a high diversity of native trees and shrubs that will contribute to riparian ecological function and stream health. Ashland will base the vegetation parameters of the future conditions scenario on other

⁴⁴ The term *thermal benefit* refers to the reduction in thermal loading. In this analysis, thermal benefit is due to a reduction in incoming solar radiation that results from the implementation of a revegetation project. Thermal benefits represent the expected environmental benefits from implementing an action. The environmental benefit provided by a project serves as the foundation of a water quality credit; however, the environmental benefits are not always fully “usable” as water quality credits. That is, not all of the water quality benefits from an action can necessarily be claimed as offset credits to meet compliance obligations. This is because there may be uncertainty about the underperformance or failure of a restoration project, or other uncertain factors in the watershed. As a result, trading policies typically set aside some portion of a project’s measured or modeled water quality benefits to account for uncertainty in the form of a ratio or discount factor. See National Network on Water Quality Trading, Building a Water Quality Trading Program: Options and Considerations (2015), available at <http://willamettepartnership.org/wp-content/uploads/2015/06/BuildingaWQTPProgram-NNWQT.pdf>.

⁴⁵ Boyd & Kasper, Analytical Methods for Dynamic Open Channel Heat and Mass Transfer: Methodology for the Heat Source Model Version 7.0 (2003), available at <http://www.deq.state.or.us/wq/TMDLs/tools.htm>. DEQ has posted this document on its website as a resource for generally describing the math and assumptions used in Heat Source. While the document explicitly covers Heat Source version 7 (and therefore Shade-a-lator version 7), the math and assumptions in version 7 are mostly the same as version 8, and so DEQ considers this document appropriate for summarizing both versions 7 and 8.

⁴⁶ Multiple input datasets are used to characterize the current conditions at a potential project site. Aerial photography or light detection and ranging (LiDAR) data will be used to establish current conditions and to highlight the potential riparian areas available for project implementation. This process involves digitizing the areas of interest, evaluating the current vegetation conditions, and then modeling the current, pre-project incoming thermal load. These conditions are incorporated into a modeling scenario that quantifies the incoming solar load that reaches the surface of the stream given the current vegetation conditions.

⁴⁷ The characteristics of the future conditions that are represented by the model parameters are the future vegetation height and future canopy density. In the Shade-a-lator model, the canopy density parameter represents the lateral attenuation of solar radiation as it passes through the riparian canopy.

trading planting projects in the Rogue River Basin and reference site surveys, including the riparian revegetation projects implemented for the City of Medford’s water quality trading program in the Rogue River Basin. Some overstory species planted at riparian revegetation trading projects in the Rogue River watershed have included: big leaf maple (*Acer macrophyllum*), black cottonwood (*Populus trichocarpa*), ponderosa pine (*Pinus ponderosa*), and white alder (*Alnus rhombifolia*). Therefore, if a project includes this species mix, the future conditions Shade-a-lator parameters would use mature tree heights for these species and associated density values based on system potential vegetation for the Bear Creek watershed identified in the Bear Creek temperature TMDL modeling.⁴⁸ Depending on the species mix at a particular site, the specific Shade-a-lator parameters might be different, but in all instances, those parameters will be consistent with the system potential vegetation characteristics associated with the species planted at a site.

For both scenarios, the model then calculates the sun angle every 25 meters (these calculation points are referred to as “nodes”) along the center of the modeled stream reach for every model time step (once per minute). At each node, the model calculates the total load of incoming solar radiation by considering the physical characteristics surrounding the node and the characteristics of the vegetation present on the streambanks (Figure 1). The difference in the incoming solar load (expressed in kilocalories per day) between the two scenarios represents the net thermal benefits generated from a riparian revegetation project.

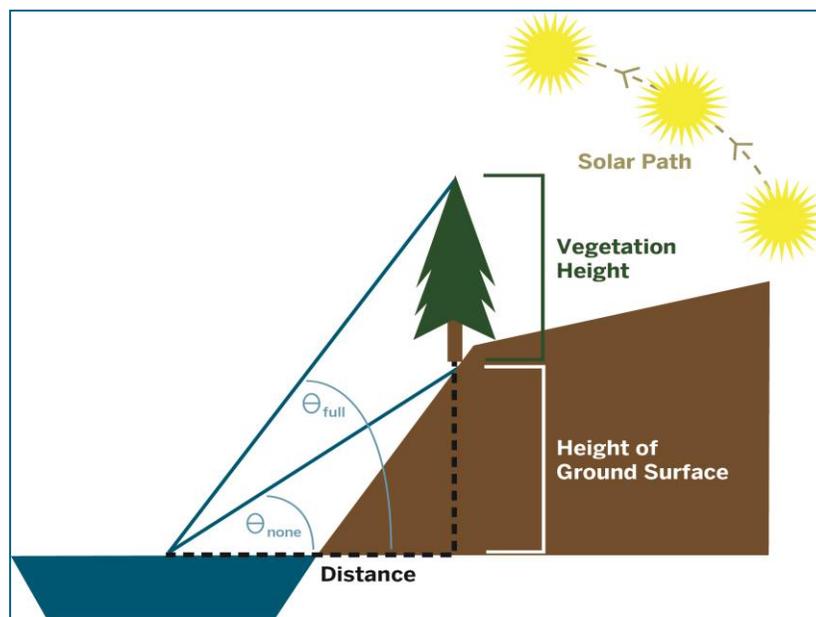


Figure 1: A cross-section schematic of the physical characteristics included in Shade-a-lator modeling. When the sun angle is less than θ_{none} all incoming solar radiation is blocked by the local topography. When the sun angle is greater than θ_{full} all incoming solar radiation reaches the surface of the stream. When the sun angle is between θ_{none} and θ_{full} the vegetation present attenuates a portion of the incoming solar radiation.

As Figure 1 shows, the sun angle is a key parameter in the Shade-a-lator model. As such, the time of the year also affects the sun angle and the associated incoming solar radiation that reaches the surface of the stream. The time of the year also affects the length of the day, and thus the overall total potential incoming solar

⁴⁸ Or. Dep’t of Env’tl. Quality, Bear Creek Watershed TMDL, Chapter 1, at 34 (2007) (discussing the relevant tree species associated with system potential vegetation). Height and density model parameters are described in Appendix A to the temperature TMDL. Or. Dep’t of Env’tl. Quality, Bear Creek Watershed TMDL, Appendix A: Bear Creek Watershed Temperature Assessment, at 16-18 (2007). Ashland proposes to use a density value of 75% for the time periods within the growing season, from May 15 to October 14, to reflect a full tree canopy. A reduced density value of 50% is appropriate to represent the canopy conditions in the spring (April 15 to May 14) before full leaf-out and in the fall (October 15 to November 14) before full leaf-drop. A density value of 10% is appropriate to model winter conditions when riparian shade is primarily provided by evergreen species.

radiation. Due to these two factors, the modeling time period is a key model parameter. As described above, the period with the greatest maximum ETL excess that must be addressed through riparian shade is from August 15 to September 14 (Table 1), and so Ashland proposes calculating thermal benefits from projects during this period so that the timing of a facility's potential excess thermal load aligns with the period of benefit from a riparian revegetation project.

Credit Duration: Credit duration, commonly known as credit life, refers to the “length of time credits are expected to be used.”⁴⁹ This refers to the period between when a credit becomes usable as an offset and when the credit is no longer valid. Credits are considered valid for use after the restoration action has been implemented and verified as functioning. Because Ashland's proposed water quality trading program will be implemented using actions that take time to realize full benefits, restoration projects must be as effective and durable as alternative technology solutions. Therefore, verification and ongoing monitoring and maintenance of project sites are integral parts of any credible trading program. The 2003 EPA Trading Policy provides that “credits may be generated as long as the pollution controls or management practices are functioning as expected” and may be used to comply with an annual, seasonal, or monthly NPDES permit limit once they have been generated.⁵⁰ Oregon rules also require that the trading plan detail how credits are quantified, taking into account the underlying assumptions and inputs used to derive the credit quantities.⁵¹ In addition, the Oregon rule definition of a credit identifies the need to specify the period of time over which water quality benefits will be generated.⁵²

For the purposes of this proposal, Ashland suggests both a minimum credit life consistent with the rules, and the appropriate start date for the credit life. With respect to a minimum credit life, the City of Medford program uses an average 20-year credit life, protected by long-term leasehold interests in the nonpoint source properties where the restoration occurs.⁵³ Clean Water Services likewise uses a minimum 20-year credit life in its temperature management plan.⁵⁴ Consistent with the 2003 EPA Trading Policy and these previous program precedents in Oregon, Ashland proposes that the credits it produces from riparian vegetation projects have a minimum 20-year credit life, with the option to extend those credits beyond the minimum life for as long as the shade sites continue to function as expected. This approach is consistent with the minimum period for which these projects are expected to function,⁵⁵ and the 2003 EPA Trading Policy. With respect to an appropriate start date, because credit life defines how long credits can be “used” and Ashland will not need to use credits for compliance until it has a new permit, Ashland proposes that the credit life of any pre-permit projects begin on the date Ashland receives its renewed NPDES permit. The proposed minimum 20-year credit life would not start when the project is implemented or initially verified, but rather when Ashland gets a permit, and starts using the credits from those sites to comply with thermal load limits in its permit. For projects implemented after Ashland receives its new thermal load permit limit, the project life and credit life would both start on the date of initial project verification.

⁴⁹ OR. ADMIN. RULES 340-039-0025(5)(f)(C).

⁵⁰ U.S. EPA, Water Quality Trading Policy, 68 Fed. Reg. at 1612.

⁵¹ OR. ADMIN. RULES § 340-039-0025(5)(f)(B).

⁵² OR. ADMIN. RULES § 340-039-0005(3) (“Credit: A measured or estimated unit of trade for a specific pollutant that represents the water quality benefit a water quality trading project generates at a location *over a specified period of time*, above baseline requirements and after applying trade ratios or any other adjustments.”) (emphasis added).

⁵³ See Or. Dep't of Env'tl. Quality, City of Medford National Pollutant Discharge Elimination System Waste Discharge Permit, No. 100985 (Dec. 13, 2011); City of Medford, Medford Regional Water Reclamation Facility Thermal Credit Trading Program Plan, at 9 (2011), available at <http://www.deq.state.or.us/wq/trading/docs/MedfordThermalTrading.pdf>.

⁵⁴ Clean Water Services, Thermal Load Management Plan, available at <https://www.cleanwaterservices.org/media/1479/temperature-management-plan.pdf>, PDF (February 28, 2005).

⁵⁵ A twenty year credit life is likely under-representative of the lifetime and values expected from a healthy, diverse, functional riparian forest. See Philip Roni, et al., A Review of Stream Restoration Techniques and a Hierarchical Strategy for Prioritizing Restoration in Pacific Northwest Watersheds, 22 NORTH AMERICAN JOURNAL OF FISHERIES MGMT. 1, Tbl. 6 (2002) (noting that while it usually takes 5-20 years for riparian restoration to achieve response, the benefits of riparian replanting are expected to extend 10-50+ years, with a medium to high probability of success). Unlike most investments, the restoration investment underlying Ashland's water quality trading program will appreciate over time into a self-sustaining solution, and so the site will likely continue to function beyond the 20-year credit life.

ORAR 340-039-0025(5)(B): BASELINE

Pursuant to the trading rule, a “trading plan must identify any applicable regulatory requirements from ORAR 340-039-0030(1) that apply within the trading area and that must be implemented to achieve baseline requirements.” Credits can only be generated from best management practices (BMPs) that result in water quality benefits above trading baseline requirements. Baseline is included within the trading rule to ensure that credits are not used to meet a regulatory obligation by more than one entity at any given time.⁵⁶ The 2003 U.S. EPA Trading Policy states that “pollutant reductions [should be] greater than those required by a regulatory requirement or established under a TMDL.”⁵⁷ In developing its rule, Oregon went one step further and specifically defined “trading baseline” as the “pollutant load reductions, BMP requirements, or site conditions that must be met under regulatory requirements in place *at the time of trading project initiation*.”⁵⁸ Regulatory requirements that are potentially applicable to trading projects include requirements stemming from NPDES permits, Oregon Department of Agriculture agricultural water quality management area rules, Oregon Board of Forestry rules, federal management plans or agreements between the state and a federal agency, CWA section 401 certifications, local ordinances, tribal laws or rules, compensatory mitigation projects, or any requirements derived from a TMDL by designated management agencies responsible for TMDL implementation.⁵⁹

Therefore, when Ashland initiates a new trading project, it will assess and document whether any of the baseline requirements described in the rule affirmatively apply to sites, and explain how these potential Rogue-specific baseline requirements apply (or not) to each individual site. If affirmative requirements do apply to BMP sites, baseline BMPs can be installed or deductions to site thermal benefit totals can be made to ensure that credit is not being taken for actions that otherwise are already required by these regulatory requirements. If no baseline obligations exist at the proposed trading project, the baseline obligation at these sites would be equal to current conditions. As part of credit verification, Ashland will evaluate each site to ensure that site-specific baseline requirements have been identified and considered in credit calculation. Below is a current overview of how the current potential sources of baseline listed in the trading rule might apply in the proposed trading area:

ORAR 340-039-0030(1)	BASELINE REQUIREMENT
(a) NPDES permit requirements	Ashland’s permit does not require riparian restoration. There are no federal or state temperature technology-based effluent limits (TBELs).
(b) Rules issued by Oregon Department of Agriculture for an agricultural water quality management area under ORAR chapter 603 division 095	<p>Inland Rogue Agricultural Water Quality Management Program Rules, ORAR 603-095-1400 et seq. ORAR 603-095-1440(3)(a): “(a) Agricultural management of riparian areas shall not impede the development and maintenance of adequate riparian vegetation to control water pollution, provide stream channel stability, moderate solar heating, and filter nutrients and sediment from runoff. (b) This condition is not intended to prohibit riparian grazing where it can be done while managing for riparian vegetation required in ORAR 603-095-1440(3)(a).” In addition, landowners must avoid excessive soil erosion (ORAR 603-095-1440(2)), unnecessary returns from surface irrigation return flows (ORAR 603-095-1440(4)) and discharge waste (ORAR 603-095-1440(5)).</p> <p>If a potential site is actively impeding the development and maintenance of adequate riparian vegetation, or associated with any of the other prohibited conditions, such a practice would need to be stopped before credit could be generated from that site.</p>

⁵⁶ OR. ADMIN. RULES 340-039-0040(2)-(3).

⁵⁷ U.S. EPA, Water Quality Trading Policy, 68 Fed. Reg. at 1610.

⁵⁸ OR. ADMIN. RULES 340-039-0005(6) (emphasis added).

⁵⁹ OR. ADMIN. RULES 340-039-0030.

(c) Rules issued by Oregon Board of Forestry under OAR chapter 629 divisions 610-680	Will be applied if/when forestry-zoned sites are considered for implementation.
(d) Requirements of a federal land management plan, or an agreement between a federal agency and the state	These will be considered on a case-by-case basis. Would not apply unless recruited site is federally or state owned.
(e) Requirements established in a Clean Water Act Section 401 water quality certification	Would only apply if Ashland is purchasing credits from land managed by an entity subject to a 401 certification. If such an entity is engaged as a potential seller of credits, Ashland will review the entity's 401 certification to ensure that the thermal benefits are not required by the certification.
(f) Local ordinances	Jackson County. Land Dev. Ord. § 8.6.4(A) (2015) ⁶⁰ : existing vegetation and tree cover “will be retained” on land within 75 feet of the top of the Rogue River bank and within 50 feet of any Class 1 or 2 streams, except in certain narrowly prescribed, regulator-approved situations, including where non-native vegetation may be removed if being replaced with native vegetation. The City of Ashland’s land use ordinance includes similar requirements to protect riparian areas, but does not affirmatively require restoration except when offsetting construction activities in protection zones. City of Ashland Land Use Ord. § 18.3.11 (2017). ⁶¹ Similar provisions exist in the Phoenix, Oregon Land Dev. Code § 3.7.2 (2017). ⁶²
(g) Tribal laws, rules, or permits	None that Ashland is aware of as a general matter, but will confirm on site-by-site basis.
(h) Other applicable rules affecting nonpoint source requirements	None that Ashland is aware of as a general matter, but will confirm on site-by-site basis.
(i) Projects completed as part of compensatory mitigation, or projects required under a permit or approval issued pursuant to Clean Water Act section 404, or a supplemental environmental project used to settle a civil penalty imposed under OAR chapter 340 division 012 or the Clean Water Act	Ashland will be acting pursuant to its NPDES permit obligations, not a supplemental environmental project (SEP) or settlement. If a potential project site is already hosting a CWA 404 or SEP project, Ashland will have the burden to demonstrate the proportion of the CWA 402 trading site that is additional.
(j) Regulatory requirements a designated management agency establishes to comply with a DEQ-issued TMDL, water quality management plan or another water pollution control plan adopted by rule or issued by order under ORS 468B.015 or 468B.110.	INLAND ROGUE BASIN LOCAL ADVISORY COMM. & OR. DEP’T OF AGRIC., INLAND ROGUE AGRICULTURAL WATER QUALITY MANAGEMENT AREA PLAN 12 (May 2010) ⁶³ (“Agricultural activities that eliminate the possibility of natural regeneration of trees and shrubs along waterways are not allowed. ... [N]ear-stream riparian management [is limited] to seasons and practices that enhance growth of grasses, shrubs, and trees canopy....”).

⁶⁰ This document can be found here: <https://jacksoncountyor.org/ds/PDFs?EntryId=37627>.

⁶¹ This document can be found here: <http://www.codepublishing.com/OR/Ashland/#!/LandUse/18.3.11.html#18.3.11.110>.

⁶² This document can be found here:

<http://www.phoenixoregon.gov/sites/default/files/fileattachments/building/planning/page/354/pldc.pdf>.

⁶³ This document can be found here:

<http://www.oregon.gov/ODA/shared/Documents/Publications/NaturalResources/InlandRogueAWQMAreaPlan.pdf>.

OAR 340-039-0025(5)(E): TRADING RATIOS

Pursuant to the trading rule, a trading plan must include a “description of applicable trading ratios, the basis for each applicable trading ratio, including underlying assumptions for the ratio, and a statement indicating whether those ratios increase or decrease the size of a credit obligation or the number of credits generated from an individual trading project.” The Oregon trading rule requires the use of at least one ratio in a trading plan, and a description of the assumptions underlying the ratio decisions.⁶⁴ Trading ratios are “a numeric value used to adjust the number of credits generated from a trading project, or to adjust the number of credits that a credit user needs to obtain.”⁶⁵ The 2007 EPA trading toolkit suggests that ratios may be necessary to address a number of factors such as delivery, location, equivalency, uncertainty, and retirement.⁶⁶ Oregon’s water quality trading rule notes that trading ratios may be used to account for attenuation of water quality benefits, BMP uncertainties, other types of risk, time lag, priority area incentives, or credit retirements.

Depending on the BMP(s) implemented, the applicable ratio(s) will change. To date, in Oregon riparian shade restoration trading programs, DEQ has approved a 2:1 trading ratio to account for the time lag.⁶⁷ Based on the 20-year credit life associated with these projects, this ratio is meant to account for the temporal lag in thermal benefits between planting (Year 0) and when the planted trees reach full shade-producing heights (Year 20). The logic supporting this ratio is meant to track riparian vegetation growth curves. For example, a growth curve⁶⁸ for Black Cottonwood (*Populus trichocarpa*)—a native species regularly planted by riparian restoration practitioners in Oregon that has a growth pattern representative of riparian plantings in the area—shows that with average regional conditions, Black Cottonwoods have grown to 9 feet tall after just one year; 23 feet tall after five years; 43 feet tall after ten years; and 81 feet tall after twenty years.⁶⁹ So by year 10, approximately half of the anticipated future thermal benefits will have been achieved at the site, which supports use of a 2:1 ratio. The mix of species and height classes at a particular site makes identification of an exact ratio difficult, and so the 2:1 ratio attempts to generally convert overall growth trends and timelines into an administrative mechanism.

Ashland proposes the use of a trading ratio for time lag in its trading plan. Specifically, for the pre-permit period, Ashland proposes use of the typical 2:1 time lag ratio, but requests reevaluation of the ratio applicable to these pre-permit sites when its permit is being renewed. Many of Ashland’s potential project sites are on narrow stream reaches, meaning that a few years of successful growth could result in meaningful shade production much earlier than on wider streams. The 2016 water quality trading IMD contemplates potential ratio reductions associated with taking early action: “[L]ower ratios are appropriate if the permittee is implementing BMPs well in advance of the anticipated compliance obligation or if water quality benefit is delivered in advance of when the credit is needed.”⁷⁰ Accordingly, at the time of permit renewal, Ashland requests that DEQ consider a lower time lag ratio for these pre-permit sites based on the actual performance of those sites.

In addition, Ashland’s projects may be located in priority areas, as identified in OAR 340-039-0043(2)(g). As such, at the time of permit renewal, Ashland may also propose ratio considerations related to priority area site implementation.

⁶⁴ OR. ADMIN. RULES 340-039-0025(5)(e).

⁶⁵ OR. ADMIN. RULES 340-039-0005(10).

⁶⁶ U.S. EPA, Water Quality Trading Toolkit for Permit Writers, 30–32, EPA 833-R-07-004 (Aug. 2007, updated June 2009) (“There is not set limit for how high a trading ratio can be. Trading ratios depend on the specific circumstances in the watershed”).

⁶⁷ See Or. Dep’t of Env’tl. Quality, City of Medford National pollutant Discharge Elimination System Waste Discharge Permit, No. 100985 (Dec. 13, 2011), available at <http://www.deq.state.or.us/wq/trading/docs/MedfordNpdesPermit.pdf>; Or. Dep’t of Env’tl. Quality, Clean Water Services National Pollutant Discharge Elimination System Watershed-based Waste Discharge Permit, Nos. 101141, 101142, 101143, 101144 and MS4 (draft Apr. 2016).

⁶⁸ Growth curves (a.k.a. site index curves) are established through observation and measurement of species growth, over time, given specific site conditions. See U.S. Forest Service Pacific Northwest Research Station, PNW-RN-533, Site Index Equations and Mean Annual Increment Equations for Pacific Northwest Research Station Forest Inventory and Analysis Inventories, 1985-2001 (2002).

⁶⁹ E.B. Peterson et al., B.C. Ministry of Forests, Black Cottonwood and Balsam Poplar Managers’ Handbook for British Columbia, Forestry Canada, at 46 (1996), available at <http://www.for.gov.bc.ca/hfd/pubs/docs/Frr/Frr250.htm>.

⁷⁰ Or. Dep’t of Env’tl. Quality, Trading IMD at 20.

OAR 340-039-0025(5)(G): MONITORING

Pursuant to the trading rule, a trading plan must include a “description of the following: (A) Proposed methods and frequency of trading project BMP monitoring; and (B) Proposed methods and frequency of how water quality benefits generated by a trading project will be monitored.” In addition, an entity that engages in trading must submit an annual report that includes all of the elements described in OAR 340-039-0017(3).

Ashland will submit an annual report that includes all of the elements described in OAR 340-039-0017(3). In addition to submitting that annual monitoring report, Ashland proposes a monitoring schedule that is consistent with the Willamette Partnership’s February 2016 riparian addendum to its General Crediting Protocol (document described in detail in section on BMP Quality Standards).⁷¹ Consistent with that protocol, a specific combination of the following three types of monitoring approaches will be applied throughout the life of each riparian restoration project to ensure that the project continues to function as expected as it relates to the performance metrics identified in the document:

- 1) **Quantitative monitoring:** project developer implements vegetation monitoring protocol by sampling random plots on site; implements repeat photo monitoring at full set of on-the-ground camera points; reports on full suite of performance standards.
- 2) **Qualitative monitoring:** on-site, rapid, but standardized, qualitative review of site condition and progress toward performance metrics accompanied by subset of repeat photos from on-the-ground camera points used in quantitative years. The same set of camera points will be repeated in all qualitative monitoring years.
- 3) **Remote monitoring:** remote sensing information to provide visual evidence that site still exists; e.g., a current year aerial image or LiDAR taken during growing season to document site persistence.

To remain consistent with Willamette Partnership approaches, Ashland proposes to monitor sites according to the schedule in Table 3:

Table 3. Dispersal of monitoring and reporting approaches over the life of a project.

1 Site: Monitoring Approach	Completed Growing Seasons After Planting and Initial Verification										
	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Quantitative Monitoring	✓	✓		✓		✓					✓
Qualitative Monitoring			✓		✓		✓		✓		
Remote Monitoring ⁷²								✓		✓	
Continued	Completed Growing Seasons After Planting and Initial Verification										
	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	
Quantitative Monitoring					✓					✓	
Qualitative Monitoring		✓					✓				
Remote Monitoring	✓		✓	✓		✓		✓	✓		

In addition to this standard proposed site monitoring, if projects are damaged by causes beyond the reasonable control of the City (e.g., wildlife, flood, vandalism), Ashland proposes that it will report that damage to DEQ. Ashland proposes reporting such incidents to DEQ within 90 days of learning of the damage, and that such a report would include: 1) a description of the event, including an assessment of the damage; 2) a plan for addressing the damage (natural restoration and/or active replanting of the site would be allowed if continued maintenance of the site is expected to provide a reasonable potential for the long term restoration of the shading function of the site in an ecologically appropriate manner; replacement with an alternative site or sites

⁷¹ Willamette Partnership, Performance Standards for Riparian Vegetation (2016), available at http://willamettepartnership.org/wp-content/uploads/2014/06/Performance-Stds-for-Rip-Reveg_2016-02-16.pdf.

⁷² In the event that remote information is not available for a monitoring year designated for remote monitoring, the qualitative monitoring approach can instead be used for that year. If this occurs, a later year designated as qualitative monitoring may be monitored remotely so long as that change does not result in more than two consecutive years of only remote monitoring.

could also be pursued); and 3) a schedule for implementing the remediation plan. If this trading plan is later incorporated into Ashland's NPDES permit, Ashland proposes that damage to a project due a cause beyond the reasonable control of the City should not in and of itself be considered a violation of its permit, and that credits from damaged project sites should remain valid so long as Ashland demonstrates to DEQ that the sites will be restored or alternative solutions will be implemented within a reasonable timeframe. This suggested approach is consistent with the approach outlined in the City of Medford's permit.⁷³

OAR 340-039-0025(5)(H): TRADING PLAN PERFORMANCE VERIFICATION

Pursuant to the trading rule, a trading plan must include a "description of how the entity will verify and document for each trading project that BMPs are conforming to applicable quality standards and credits are generated as planned."

The Oregon trading rules require that an entity using trading verify and document that BMPs conform to quality standards, and that the credits are tracked and made available for the public.⁷⁴ To be consistent with the Oregon water quality trading rule, Ashland will pursue a verification approach consistent with the Willamette Partnership's standards for verification.⁷⁵

Specifically, after a site has been implemented, a third-party verifier will conduct a full verification review, including administrative review of the site's eligibility, technical review of credit calculation, and confirmation via a site visit that a project has been implemented consistent with the BMP quality standards included in this trading plan. Until a site is "established" (around project Year 5), verifiers will review monitoring reports and attest that the site does not appear at risk of failure. At later milestones in the project (specifically Years 5, 10 and 15), a third party verifier will confirm that the site is continuing to mature and develop on a trajectory that is materially consistent with the as built site and quality standards. In the years between these milestone verifications, verifiers will continue to review annual monitoring reports and provide attestation that the site does not appear at risk of failure. At the close of a project's full life, a third-party verifier will conduct a final verification, including a review of originally estimated credit calculation versus a final credit calculation, a comparison of predicted Year 20 site conditions versus actual Year 20 site conditions, and an on-site visit to confirm that Year 20 quality standards have been met.

OAR 340-039-0025(5)(I): TRACKING AND REPORTING

Pursuant to the trading rule, a trading plan must include a "description of how credit generation, acquisition and usage will be tracked and how this information will be made available to the public."

Transparency is critical to a credible trading program. Therefore, in addition to completing monitoring (as described above), submitting annual compliance reports and completing performance verification, Ashland will post credit information on a publicly accessible website, registry, or tracking tool in order to disclose project site- and program-level content and project successes. As evidenced by other ecosystem service program tracking tools around the country,⁷⁶ there are several models for hosting this information, including use of a

⁷³ Or. Dep't of Env'tl. Quality, City of Medford National Pollutant Discharge Elimination System Waste Discharge Permit, No. 100985, Schedule D(7)(b)(v) (Dec. 13, 2011).

⁷⁴ "Credits may be used for compliance with NPDES permit requirements ... once implementation of BMPs has been verified as consistent with applicable BMP quality standards according to OR. ADMIN. RULES 340-039-0025(5)(h)." OR. ADMIN. RULES 340-039-0040(5)."

⁷⁵ Willamette Partnership, Ecosystem Credit Accounting System Third Party Verification Protocol Version 1.0 (2009), *available at* <http://willamettepartnership.org/publications/>.

⁷⁶ Environmental credit trading programs have used several approaches to track program progress, Markit, an environmental credit registry, is one such portal for project information. The Electric Power Research Institute (EPRI) tracks the Ohio River Basin Nutrient Trading Program through Markit (<https://mer.markit.com/brreg/public/orb/index.jsp?s=cp>), as does The City of Medford with its temperature compliance program managed by The Freshwater Trust (https://products.markit.com/brreg/public/index.jsp?entity=holding&name=&standardId=&unitClass=&sort=account_name&dir=ASC&start=450). The California Air Resources Board (CARB) uses a password-protected market tracking system called Compliance Instrument Tracking System Service (CITSS) to track and manage GHG credits (<http://www.arb.ca.gov/cc/capandtrade/markettrackingsystem/markettrackingsystem.htm>). SO_x and NO_x trades completed pursuant to the federal Clean Air Act must be registered in an EPA-managed database that serializes credits. EPA, Air Markets Program Data,

third-party registry, registration on agency website, or a hosted registry/tracking tool. For programs that involve restoration actions that last decades, a single location that serves as a clearinghouse for site-specific information—including project design documents, annual photo points, monitoring reports, and project performance information—is useful for both DEQ and external members of the public. Ashland will ensure that: 1) individual thermal benefits and transactions are accounted for and can be tracked, 2) program implementation progress can be tracked, and 3) sufficient information is provided related to individual project site trajectory (i.e., annual monitoring reports).

OAR 340-039-0025(6): ADAPTIVE MANAGEMENT

Pursuant to the trading rule, a trading plan must include a “description of how monitoring and other information may be used over time to adjust trading projects and under what circumstances.” Significant program amendments may require public review and comment, but other small changes will fall under the scope of adaptive management.⁷⁷

Ashland recognizes the importance of long-term maintenance and monitoring of projects in order to ensure overall trading program, specific project success and ecological improvement in program areas. The three-tiered monitoring approach described above will allow for programmatic tracking and evaluation of progress toward thermal benefit needs. The multi-decadal timeframe of the anticipated trading program necessitates the ability to adapt implementation, maintenance, monitoring, and performance tracking practices to reflect new knowledge, technology and information as it emerges. As technologies, BMP implementation, and monitoring practices evolve, it is expected that more efficient approaches or better knowledge about sources and methods to achieve program goals will also develop.

To adapt and improve the program over time, Ashland therefore proposes a five-year adaptive management cycle. A five-year review cycle provides a regular opportunity to review available data from the previous years of implementation, maintenance, and monitoring, and to incorporate new technologies and lessons learned through previous implementation cycles into BMP quality standards and guidelines, as well as monitoring, maintenance, and performance tracking protocols. Periodic review also affords transparency and quality control. A review period of five years is recommended to allow enough time to properly evaluate: 1) progress toward overall programmatic goals, as well as 2) the effectiveness of maintenance approaches and monitoring protocols. Data on restoration projects, while limited, also suggests that there is the potential for substantial time lag in measuring the ecological effectiveness of watershed restoration, and so a five-year window provides more flexibility to appropriately collect and analyze these data.

<http://ampd.epa.gov/ampd/>. The MWMC and Medford use Markit to register its SRF pilot program sites—to track and report on progress toward achieving program goals, as well as to confirm that projects are in place and meeting quality standards for implementation.

⁷⁷ In the City of Medford permit, DEQ notes that “significant amendments include changes in trading ratio, types of trades or trading metrics (for example, addition of an activity to a riparian shade restoration program that provides cooling or prevents heating but is not measured using a shading metric), or changes to trading parameters (for example, addition of nutrients to a thermal load credit program).” DEQ notes that “DEQ approval and public review is not required for trading agreements, specific project sites, or minor amendments to the program provided they are consistent with the overall direction and objectives of the permittee’s DEQ-approved credit trading program.” Or. Dep’t of Env’tl. Quality, City of Medford National Pollutant Discharge Elimination System Waste Discharge Permit, No. 100985, Schedule D(7)(a)(i)-(ii) (Dec. 13, 2011).

Use of SRF Funds to Generate Water Quality Trading Credits

OAR 340-039-0040(4): FINANCIAL ADDITIONALITY

Ashland received a Clean Water State Revolving Fund (SRF) Sponsorship Loan from DEQ in 2013. As stated in its application, Ashland intended to use a portion of the SRF funds to implement riparian shade projects to help it comply with its expected thermal load limits. Ashland's intent to use SRF funds to reimburse expenses associated with implementing, stewarding and monitoring temperature credit projects is relevant in two ways: financial additionality,⁷⁸ and project reimbursement eligibility.

Many trading programs, including Oregon's, include restrictions meant to ensure that the environmental benefit secured through the sale of a credit is in addition to what would have occurred without it. The Oregon rule specifically states that "credits generated under an approved trading plan may not include water quality benefits obtained with public conservation funds."⁷⁹ Therefore, the type of money used to purchase or develop credits does matter. Fortunately, the Oregon rule explicitly defines SRF loan funds as not being "public conservation funds"⁸⁰, meaning that trading projects funded by Ashland with these funds do not run the risk of violating Oregon's financial additionality obligations.⁸¹

⁷⁸ To be additional, thermal benefits used to meet Ashland's thermal load exceedance should be generated from BMPs funded by and implemented by, or on behalf of, Ashland. BMPs that are currently funded by another source of "public conservation funds" are not considered financially "additional" because they are already occurring. Because these actions would have occurred in the absence of an Ashland trading program, Ashland could not track any of these benefits to count as offsets against its thermal load exceedance. Federal, state or local cost-share funds (e.g., "public conservation funds") may be used to supplement BMPs that are being funded by Ashland or to help meet baseline obligations. However, public conservation funds cannot be used to generate thermal benefits that would count toward meeting Ashland's ETL excess. In the event that public conservation funds are used to supplement a thermal benefit-generating restoration project, it would be Ashland's responsibility to demonstrate that no public conservation funds were used to generate thermal benefits

⁷⁹ OR. ADMIN. RULES 340-039-0040(4).

⁸⁰ OR. ADMIN. RULES 340-039-0005(4) ("Public Conservation Funds: Public funds that are targeted to support voluntary natural resource protection or restoration. Examples of public conservation funds include United States Department of Agriculture (USDA) cost share programs, United States Environmental Protection Agency (EPA) section 319 grant funds, United States Fish and Wildlife Service Partners for Fish and Wildlife Program funds, State Wildlife Grants, and Oregon Watershed Enhancement Board restoration grants. Public funds that are not considered public conservation funds include: public loans intended to be used for water quality infrastructure projects, such as Clean Water State Revolving Funds, USDA Rural Development funds, and utility sewer storm water and surface water management fees.") (emphasis added).

⁸¹ EPA regulations are silent on this particular issue. However, the 2014 statutory amendments to the Clean Water SRF program suggested a strong inclination toward green infrastructure. Relevant to green infrastructure investment under the SRF program, the 2014 Water Resources Reform and Development Act (2014 WRRDA), Pub. L. No. 113-121, 128 Stat. 1193 (2014), expanded the list of eligible projects, requires utility recipients of SRF loans to certify that the utility "has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation ..." and updated the SRF definitions to incorporate by reference the definition of "treatment works" to include the acquisition of land "that will be an integral part of the treatment process" and for construction.



Performance Standards for Riparian Revegetation

February 16, 2016

INTRODUCTION

The following is intended to serve as revised performance standards (Section I) and recommendations (Appendix A) for riparian restoration projects generating credits under the Willamette Partnership Ecosystem Credit Accounting System. The original standards were developed through collaboration with riparian restoration experts in the Willamette and Rogue Basins and have since been applied in those watersheds, as well as Oregon's John Day and North Coast watersheds. The standards have continued to evolve between their first application in 2011 and presently in 2016. Through that time, additional input and review was solicited from entities that operate throughout Oregon representing expertise in agricultural production, riparian restoration, and mitigation.

In 2015, Willamette Partnership engaged in robust discussions regarding how to more efficiently achieve a high level of confidence regarding riparian site condition through the use of revised performance standards. The metrics in this performance standard were selected to achieve four key criteria: 1) Science-based and credible; 2) Transparent and replicable; 3) Efficient and practical to apply; and 4) Applicable to a range of environmental conditions.

These revised performance criteria have been informed by reference site data from higher-quality riparian forests in multiple watersheds across Oregon, representing a range of ecoregions and precipitation patterns. Metric selection was also informed by experience monitoring credit-generating riparian revegetation projects in accordance with Willamette Partnership's 2011 draft riparian performance standards, review of relevant literature, and comparison to other riparian revegetation monitoring standards and programs. Documentation for the revisions incorporated herein is available upon request. Alternate criteria will be considered where supported by robust documentation of reference site conditions.

I. PERFORMANCE STANDARDS FOR RIPARIAN REVEGETATION PROJECTS GENERATING CREDITS

A. DEFINITIONS

Canopy Closure¹:

Canopy closure is an upward-looking point estimate of the coverage of a forest canopy, and may be measured in the field with a spherical densiometer (also called a mirror optometer) or by analyzing upward-looking hemispherical photographs.

Cover (or Absolute Cover)¹:	Cover is a downward-looking measure of the percentage of the ground surface covered by living plant leaves and stems. Areas not covered by vegetation are counted as unvegetated substrate. Total cover may be greater than 100% if species are present in multiple strata (i.e., tree, shrub and herbaceous layers).
Cover (Canopy):	Absolute cover as viewed from above tree height.
Cover (Native Shrub and Vine):	Absolute cover as viewed from beneath tree height.
Hydrologic zones²:	Hydrozones, or hydrologic zones, are areas of relatively homogenous flood frequency, water table height, patterns of water transfer, and other hydrological characteristics, particularly those that affect plants.
Invasive Species:	A plant species should automatically be labeled as invasive if it appears on the current Oregon Department of Agriculture Noxious Weed list, plus known problem species including <i>Mentha pulegium</i> (pennyroyal) and <i>Elaeagnus angustifolia</i> (Russian Olive).
Project year:	Project year is measured as the number of completed growing seasons following initial verification, starting at 0. For example, where plantings are installed in the winter, the following fall would be considered the beginning of project year 1, because the plantings have gone through 1 spring and summer growing season.
Sampling:	Data will be collected using a standard random sampling method. Radial plots, rectangular plots, and belt transect methods are acceptable.
Shrub³:	A perennial woody plant that is usually multi-stemmed and normally grows to heights of 16 feet or less.
Tree³:	A perennial woody plant, usually with a single stem or few stems, that normally grows to a height greater than 16 feet.
Vine³:	A twining or climbing plant with relatively long stems. Vines may be herbaceous or woody.

B. PROJECT DESIGN

1. A project area includes the entire area, geospatially delineated, for which the Project Developer seeks shade credit. Project areas must border a river or stream with perennial flow.⁴
2. The Project Developer shall characterize reference sites to support project design.

¹ Jennings, Brown, and Sheil. 1999. Assessing forest canopies and understory illumination: canopy closure, canopy cover, and other measures. *Forestry*, Vol. 71, No.1, pp-59-73.

² Chen et al. 2010. GIS-based Spatial Hydrological Zoning for Sustainable Water Management of Irrigation Areas. International Environmental Modelling and Software Society (iEMSs) 2010 International Congress on Environmental Modelling and Software Modelling for Environment's Sake, Fifth Biennial Meeting, Ottawa, Canada.

³ Definitions from USDA, http://plants.usda.gov/growth_habits_def.html.

⁴ The ecological value of intermittent systems and their contribution toward watershed health is recognized; however, at this time, Willamette Partnership is not able to reflect the inherent ecological diversity in intermittent stream systems. Furthermore, Willamette Partnership is not aware of a method for developing reference sites for intermittent streams.

a. Reference Site Selection Requirements:

- i. Reference sites must be located within the same Fifth Field HUC (HUC5)⁵ and be within 50% of the elevations of the highest and lowest anticipated project areas.⁶
- ii. As possible, reference sites should be consistent with the soils and/or substrate, hydrology, and geology of the project site.
- iii. Reference sites should support either a naturally regenerating or established appropriate vegetative community within the active riparian area of a river or stream, including the area within 75 feet of the river or stream, or otherwise to best reflect hydrozones at the site.
- iv. The reference site must extend over at least 10,000 contiguous square feet (0.23 acres) and be representative of the typical vegetation and substrate.
- v. Reference site riparian communities must support at least 5 native woody species, and trees must have an average minimum height of at least 10 feet, unless the typical mature plant community for the setting and substrate is documented otherwise.
- vi. Total cover of invasive species should not exceed 20%.
- vii. A minimum of two reference sites is required for each HUC5 in which projects are located.⁷

The Project Developer must detail its reference site search and selection protocol, the process it went through in seeking references sites consistent with all of these criteria, and note how the best suitable sites were selected.

If the Project Developer is unable to find a reference site consistent with all of these criteria, Willamette Partnership will approve use of alternate criteria where justified and documented.

- b. Reference site data collection:** The Project Developer must collect reference site data and identify site locations, as well as plots or transects where applicable, using GPS or GIS and a representative photo. Data from each survey must be maintained and made available upon request, and summary data should be provided in the Project Design.

Data collected must include the following information for each reference site, at a minimum:

- GPS coordinates and datum;
- data collection date(s);
- collector name;
- percent cover of native shrubs and woody vines, by species;⁸ or stem density of native shrubs and woody vines;
- density of trees;
- percent canopy cover or closure;
- percent cover invasive woody species;
- percent cover invasive herbaceous species;
- woody plant species list; and
- invasive species list and relative abundances.

The *Sample Riparian Revegetation Monitoring Protocol* (Appendix A. Section 3) and an associated *Sample Monitoring Data Collection Form* (available upon request) are provided as examples illustrating appropriate protocols for collecting data on reference conditions. Willamette Partnership understands that monitoring procedures will vary to suit the needs of each project or program. Additional examples of monitoring protocols can be found in the Willamette Partnership *Stewardship and Monitoring Plan Example*, available at <http://willamettepartnership.org/market->

⁵ www.oregon.gov/DSL/PERMITS/docs/huc5.pdf.

⁶ This range is calculated as (lowest elevation – (lowest elevation* 0.5)) through (highest elevation + (highest elevation* 0.5)).

⁷ Reference sites may be used for multiple restoration projects within the same HUC5.

⁸ Including at least all species with cover >5%.

tools-rules/water-quality. If a Project Developer elects to use their own protocol, it should be made available to Willamette Partnership upon request.

3. **Planting**

- a. **Base plantings on reference site and professional judgment:** Plantings must be based on appropriate plant community determined by local reference sites. It is understood that Project Developers will also take into account conditions and species present at a restoration site and utilize their professional judgment when developing a site-specific planting plan.
- b. **Use local plant stock if available:** Unless otherwise unavailable, the Project Developer should use only woody plant materials grown from seed, cuttings, or other plant materials collected from natural populations growing within either the WWETAC Provisional Seed Zone for Conifer and Shrub Species⁹ or the EPA Level III Ecoregion¹⁰ containing the project area(s). Seed collection at extreme elevation should be avoided.

C. PERFORMANCE STANDARDS

- 1. **Monitoring:** The Project Developer shall submit monitoring reports that describe site condition, management actions taken, management actions anticipated, and overall progress toward the performance criteria below on an annual basis, or as described in the General Crediting Protocol. Sample monitoring reports are available upon request.
- 2. **Performance Criteria:** At the end of the 5th, 10th, 15th, and 20th project year, collected data must demonstrate that the project area meets the performance criteria shown in Table 1 below.

Alternate project performance criteria will be considered where supported by robust documentation of reference site conditions. Review and approval of alternate criteria by Willamette Partnership and appropriate experts approved by Willamette Partnership should occur prior to initial project verification.

Table 1. Performance Criteria for Riparian Plantings

Criteria	Performance criteria			
	Year 5	Year 10	Year 15	Year 20
EITHER: 1) Mean stem density of native shrubs and woody vines ¹¹ OR 2) Site average for combined native shrub and woody vine cover	Meets or exceeds 1600 live native woody stems per acre	80% of the native woody stem density identified at the end of the fifth growing season	70% of the native woody stem density identified at the end of the fifth growing season	Same as performance criteria for year 15
% canopy closure or cover	N/A	N/A	≥ 25%	

⁹ The USDA’s Western Wildland Environmental Threat Assessment Center (WWETAC) is in Prineville, Oregon, www.fs.fed.us/wwetac/.

¹⁰ www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm.

¹¹ Mean woody stem density is determined by counting all live woody stems taller than six inches (regardless of vigor) by species within reference sites. Count multi-stem species (e.g., *Symphoricarpos*, *Rosa*) as one stem per square foot (1’ x 1’).

Native trees/acre	None	(Dry ecoregions) ¹² ≥ 50 trees/acre (Wet ecoregions) ¹³ ≥ 100 trees/acre
Number of native woody species	At least 5 native woody species present	
Invasive woody and herbaceous cover	No greater than 20% cover invasive herbaceous species No greater than 10% cover invasive woody species	
Non-native woody and herbaceous cover	Take and document actions reasonably necessary to evaluate the risk posed to project site by non-native species, where they are problematic (e.g., <i>Phalaris arundinacea</i> (Reed canary grass), <i>Hedera helix</i> (English ivy), <i>Ilex aquifolium</i> (English holly)), taking the steps necessary to control those non-native species such that their presence does not prevent the successful establishment and propagation of native ecosystem characteristics and functions. This includes monitoring and reporting % cover of such species. ¹⁴	

¹² For the purposes of this performance standard, EPA Level III ecoregions in Oregon that are considered to be “dry”: Klamath Mountains, Blue Mountains, East Cascades, Columbia Basin, Northern Basin and Range.

¹³ EPA Level III ecoregions in Oregon that are considered to be “wet”: West Cascades, Willamette Valley, Coast Range.

¹⁴ In particular, this standard is intended to address *Phalaris arundinacea*. *P. arundinacea* was considered for inclusion as an invasive species; however, given its pervasiveness in western Oregon and the evolving nature of science regarding its role in riparian function, Willamette Partnership has chosen to forego development of a quantitative standard at this time with the intention to reconsider its status within the standards by 2020.

APPENDIX A. VOLUNTARY GUIDANCE AND RECOMMENDATIONS FOR RIPARIAN REVEGETATION

1. CONSIDERATIONS FOR SUCCESSFUL RIPARIAN REVEGETATION

The following recommendations are based on the experience of riparian restoration professionals from Clean Water Services in Oregon's Tualatin River basin.

- A. Hydrology: Consider the frequency and duration of water inundation and groundwater influences. Divide the planting area into hydrologic zones based on elevation and flood period. Most sites include one or more of the following planting zones with respect to hydrology during the growing season: Toe (Wet) - standing or flowing water/nearly constant saturation, anaerobic soils; Bank and Overbank(Moist) - periodically saturated, anaerobic and/or aerobic soils; Transition (Dry) - infrequent inundation/saturation, if any; aerobic soils.
- B. Soils and substrate: Unless soils and/or site substrate is heavily compacted, tilling and disking disturb soils and are generally unnecessary for successful revegetation and may even encourage colonization by invasive species.
- C. Weeds and Site Context: Consider site preparation and future maintenance needs in light of characteristics of current vegetation. Consider the current and potential influences of areas surrounding site (e.g., the introduction of propagules of non-native species) and select boundaries and all-season access points that facilitate maintenance.
- D. Plant Materials: To the extent possible, all plant seed and material should be procured from nurseries that use sustainable practices defined by organizations like Salmon Safe, Food Alliance, NRCS, etc. NRCS Plant Materials Centers¹⁵ provide resources to guide selection of plant materials. One to two-year old bare root seedlings yield excellent results at most sites. Bare root or containerized plants may be used, but the cost of transporting and planting containerized stock is typically higher. Cuttings from native *Salix*, *Populus*, *Cornus*, *Spiraea*, *Lonicera*, and other species can effectively supplement bare root plantings. *Salix*, *Populus*, and *Cornus sericea* will be most appropriate on steep streambanks. Consider genetic diversity amongst cuttings, repeated cuttings from the same individuals may not provide the same benefits in terms of habitat and resilience in the plant community. Native grass and forb seed can help with erosion and weed control. Small-stature native grasses are recommended to prevent excessive competition with planted trees and shrubs for moisture and sunlight. Bare root seedlings should be protected from freezing and drying during transport and planting.
- E. Planting: Planting in curved rows at regular spacing intervals can facilitate maintenance. Planting season with bare root plants typically lasts from late January to mid-March in Western Oregon. Fall and spring plantings are also possible if using containerized stock. Plan to inter-plant at approximately 25 percent of original planting numbers in project year two. When considering plantings in the zones below the ordinary high water and on point bars, take into account the geomorphic processes of the stream or river system, as plantings in this area may disrupt sediment transport processes at the site and downstream. They are also at high risk of loss from scour.
- F. Plant protection: Consider potential for herbivory by beaver, nutria, deer, elk and voles. Select species and orient planting to reduce losses. In grassy areas, consider spring ring spray for vole protection and moisture conservation. Voles will not likely girdle plants unless they are under the cover of grass. In areas with beaver activity, provide sufficient food supplies (willow) near den and slide access areas to concentrate herbivory activity. Consider supplemental plant material stocking during the fall months, when beaver are most active in rebuilding structures. Some professionals choose to protect existing large trees with a min 4' welded wire (or higher if site floods).

¹⁵ <http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/>

- G. Maintenance: Visit site regularly. During site establishment, minimum maintenance on most sites includes one spring ring spray, one summer mow or cut and one fall spot spray. In irrigated riparian areas, with water rights, irrigation may be an appropriate option during the first two years. The need for irrigation can usually be avoided in a typical summer with proper plant selection and placement and good grass control (e.g., moisture conservation ring spray) around plants. In some locations, a 25% inter-plant of lost plants in project year two may be more cost-effective than irrigation.
- H. Woody plant density recommendations: Although woody plant stem densities vary widely among Oregon plant communities, and should be confirmed through reference site data, the recommended range for planting on Willamette Valley riparian areas is between 2,000 and 2,600 stems per acre. Sample formulae for calculating densities are as follows:

Tree stems = square footage of planting area x 0.01

Shrub stems = square footage of planting area x 0.05

These formulae are intended to be used as a guide and stem density should be modified to reflect site conditions, localized reference conditions, restoration objectives, and target plant community types. For example, these values may need to be adjusted downward for low precipitation areas, local conditions may dictate planting density, or planting density may vary within the site.

2. SAMPLE REFERENCE SITE DATA COLLECTION PROTOCOLS

Using the *Reference Site Data Form* (available upon request), collect data using a standard sampling methodology. At a minimum, radial plots, rectangular plots, and belt transect methodologies are acceptable.

- **Radial Plots**: Plots located at random to represent the reference sites. Location of plots should not be intended to maximize or minimize any particular metric. Random plot locations may be generated using GIS or other methods. Plots that fall within a stream or pond may be moved landward in a direction perpendicular to the stream or pond edge. Plot relocations and unique conditions should be noted on the data forms.
- **Rectangular Plots**: Rectangular macroplots with the long end oriented perpendicular to the stream (and crossing all the hydrozones).
- **Belt Transects**: 1m or wider belt transects oriented perpendicular to the stream and covering the entire riparian corridor within reference sites, as described in Roegner, G.C. et al. 2008.¹⁶

Count all live woody stems taller than 6" (regardless of vigor). Count multi-stem species (e.g., *Symphoricarpos*, *Rosa*) as one stem per square foot (1' x 1').

Estimate cover of native woody species, non-native woody species, invasive woody species, native herbaceous species, non-native herbaceous species, invasive herbaceous species, and unvegetated substrate within reference site plots or transects to the nearest 5%. Cover is defined as absolute cover and is measured as the percentage of the ground surface covered by living plant leaves and stems when viewed from above. Areas not covered by vegetation are counted as unvegetated substrate. Cover may be greater than 100% if species are present in multiple strata (i.e., tree, shrub and herbaceous layers). Indicate 'T' for Trace for species that cover less than 5% of the plot.

Reference Site Data Summary

The Project Developer should summarize reference site plot data for each program area or basin. In cases where alternate project performance criteria are being considered, this information will help establish the minimum revegetation standards against which the project(s) will be evaluated by the Verifier at the end of the fifth growing season following planting. The following table provides an example.

¹⁶ Roegner, G.C. et al. 2008. *Protocols for Monitoring Habitat Restoration Projects in the Lower Columbia River and Estuary*. Available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15793.pdf.

Project Developer:		Date:	
Collected by:			
HUC 5 (10 digit):			
Number of reference sites:			
Reference site locations			
	1	2	3
Latitude and longitude or address, attach map			
Elevation:			
Size:			
Number of reference plots or transects:			
Number of native woody species			
Reference site photos: Attach photos			
	Min	Max	Mean
Woody stem density/plot or transect; OR			
Combined native shrub and woody vine cover			
Native trees/acre			
Canopy cover or closure (%)			
Invasive herbaceous species cover (%)			
Invasive woody species cover (%)			

3. SAMPLE RIPARIAN REVEGETATION MONITORING PROTOCOL

The following method, which focuses on methods for measuring native woody stem density and native and invasive species cover, is for informational purposes. Additional examples of monitoring protocols are available in the Willamette Partnership *Stewardship and Monitoring Plan Example*.¹⁷

A. Plot Size and Location

Data will be collected using a standard sampling methodology. At a minimum, radial plots, rectangular plots, and belt transect methodologies are acceptable. Plots will be located randomly. Location of plots should not be intended to maximize or minimize any particular metric. Random plot locations may be generated using GIS or other methods. Plots that fall within a stream or pond may be moved landward in a direction perpendicular to the stream or pond edge. Plot relocations and unique conditions should be noted on the data forms.

- **Radial Plots:** Radial plots located at random to represent the planting area. **Rectangular Plots:** Rectangular macroplots with the long end oriented perpendicular to the stream (and **crossing all the hydrozones**).
- **Belt Transects:** 1m or wider belt transects oriented perpendicular to the stream and covering the entire riparian corridor within reference sites, as described in Roegner, G.C. et al. 2008.¹⁸

The *Monitoring Data Form* is included as Table 3.

¹⁷ *Stewardship and Monitoring Plan Template* and *Stewardship and Monitoring Plan Example* are available at: <http://willamettepartnership.org/tools-templates>

¹⁸ Roegner, G.C. et al. 2008. *Protocols for Monitoring Habitat Restoration Projects in the Lower Columbia River and Estuary*. Available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15793.pdf.

B. Native Tree, Shrub and Woody Vine Stem Counts

Using the *Monitoring Data Form*, count all live woody stems taller than 6" (regardless of vigor) within plots. Count multi-stem species (e.g., *Symphoricarpos*, *Rosa*) as one stem per square foot (1' x 1'). The count should include both planted and non-planted vegetation. Note significant instances of low vigor, damage from animals and other apparent problems on the data sheet.

C. Native and Non-Native Species Cover

Estimate cover of native woody species, non-native woody species, invasive woody species, native herbaceous species, non-native herbaceous species, invasive herbaceous species, ground substrate within plots to the nearest 5%. Cover is defined as absolute cover and is measured as the percentage of the ground surface covered by live plant leaves and stems when viewed from above. Areas not covered by vegetation are counted as unvegetated substrate. Cover may be greater than 100% if species are present in multiple strata (i.e., tree, shrub and herbaceous layers). Indicate 'T' for Trace if a non-native species covers less than 5% of the plot.

D. Timing of Data Collection

Data collection should occur following the expression of seasonal plant growth and mortality and prior to leaf drop. In most areas this period will include the months of September and October. Data collected outside of this period are subject to additional review.

E. Determining Sample Size

Initial sample size may be determined using the minimum plot number in the table below or by using the sample size workbook available on the Oregon Department of State Lands website.¹⁹

Table 2. Sample summary of sampling plot size relative to site size.

Plot Size	Project Area/Minimum Plot Number ²⁰		
	Up to 2 acres	>2 to 5 acres	>5 acres
11.7' radius (3.57m)	9	17	25

F. Data Analysis and Reporting

Monitoring should yield data that provide 80% confidence that reported values are within ± 10 units of the true population.²¹ Plot or transect data should be summarized in following or similar format and the results compared to the eligibility standards.

¹⁹ www.oregon.gov/DSL/PERMITS/docs/sample_size_workbook.xls in Oregon Department of State Lands' *Routine Monitoring Guidance for Vegetation* (Draft Sept 23, 2009).

²⁰ Where the use of minimum plot number will not yield statistically valid results, additional plot data will be required.

²¹ Oregon Department of State Lands' *Routine Monitoring Guidance for Vegetation* (Draft Sept 23, 2009).

Table 3. Sample Monitoring Data Form

Project Developer:					Date:				
HUC 5:		Project Area Name:							
Plot or Transect#	Number of woody species	Woody stem count per acre	% Native woody cover	% Non-native woody cover	% Invasive woody cover	% Native herbaceous cover	% Non-native herbaceous cover	% Invasive herbaceous cover	% unvegetated substrate
1									
2									
3...									
Total									
Mean (CIx = Y1-Y2)									
Standard Deviation									
Standard Error									
Low Estimate (Y1)									
High Estimate (Y2)									

CI= Confidence Interval, x = 80% confidence level, Y1 = low estimate, Y2 = high estimate

Standard Error is calculated as the Standard Deviation divided by the square root of the number of plots (n).

Y1 and Y2 are calculated as Mean ± (standard error * t-factor 80%).

4. EXAMPLE PROGRAM DEVELOPMENT CHECKLISTS

Pre-enrollment Checklist

- WWETAC Provisional Seed Zones for Conifer and Shrubs _____
- EPA Level III Ecoregion and HUC 5 boundaries _____
- Preliminary program area(s) boundary mapped _____
- Land ownership assessed and mapped _____
- Landowner agreement drafted _____
- Existing and potential nursery capacity evaluated _____
- Existing and potential contractor capacity evaluated _____
- Range of site conditions evaluated _____
- Revegetation limiting factors/risk assessment _____

Enrollment/Pre-implementation Checklist

- Final program area boundary mapped _____
- Preliminary reference sites selected _____
- Preliminary project area(s) identified and mapped _____
- Landowner agreement(s) signed _____
- Reference site plot data collected and summarized _____
- Site prep, planting and maintenance practices established _____
- Monitoring plan developed _____
- Preliminary species list established _____
- Preliminary nursery list established _____
- Nursery stock type(s) selected _____
- Preliminary contractor list established _____
- Nursery (incl. seed) and cold storage contract(s) executed _____
- Revegetation contract(s) executed _____

Implementation Checklist 1

- Final project area(s) identified and mapped _____
- Project prescription(s) developed _____
- Project(s) prepared and inspected _____
- Project(s) planted and inspected _____
- Project(s) maintained and inspected _____
- 15% implementation contingency in place for each project _____

Implementation Checklist 2

- Nursery contract(s) evaluated/modified as necessary _____
- Revegetation practices evaluated/modified as necessary _____
- Revegetation contract(s) evaluated/modified as necessary _____
- Monitoring data collected and analyzed _____
- Determination of acceptable progress or contingency plan _____

wastewater treatment fund

Project Name: **WWTP Riparian Restoration/Shading**
Water Quality Temperature Trading Program

Proj #: 2018-21

Total Project Cost: **\$2,908,010 (first 5 years)**

Duration: 25 years (2043)

Prior Yrs	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
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Expenses:

Design	\$163,010	\$100,000					
Construction	\$20,000	\$365,000	\$600,000	\$660,000	\$380,000	\$420,000	\$200,000

Revenues:

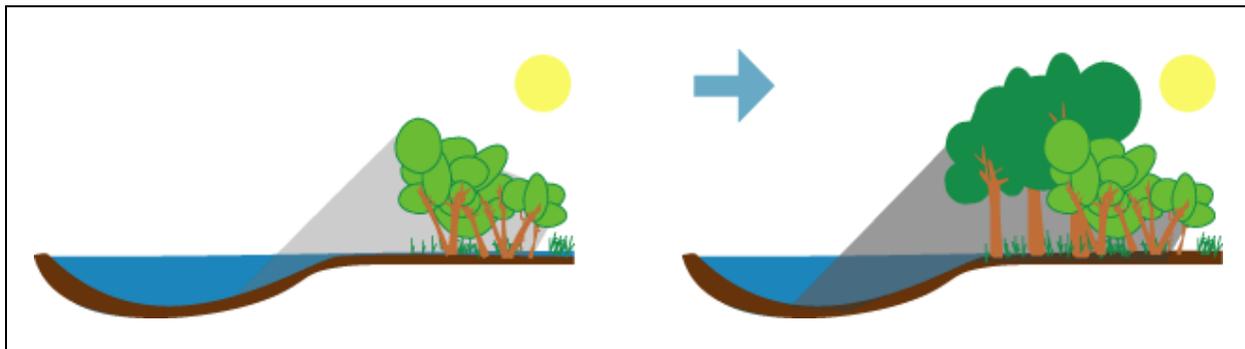
Fees	\$155,560	\$395,250	\$510,000	\$561,000	\$323,000	\$357,000	\$170,000
SDCs 15%	\$27,450	\$69,750	\$90,000	\$99,000	\$57,000	\$63,000	\$30,000
Grant							
Other							

“Other”: In addition to rates and fees, a significant portion of funds for this project are part of a DEQ CWSRF Loan #R11754 (\$2,000,000) which was updated and approved by Council on February 6, 2018. The loan will be repaid over time and will be shown in a debt account.

Anticipated Long Term Expenses: This is a 20-year tree planting and riparian restoration project per site. Initial capital outlay is for site preparation and planting, and the initial 5 years to maintain the plantings which includes site clean-up, watering and potentially some re-vegetation for each site. Costs will diminish through the 20-year life as trees and vegetation matures. After the initial 5 year outlay for capital, this item will transition to wastewater treatment plant operational expenses. Loan funds will be repaid through previously anticipated increases to rates and fees. O&M costs are anticipated starting at \$80,000 and going down to \$50,000 per year for 20 years.

Description:

This is one of several projects the City will complete to meet anticipated temperature standards to comply with new state water quality regulations as anticipated for the WWTP DEQ National Pollutant Discharge Elimination System (NPDES) permit renewal. This project was initiated with the completion of the 2012 Comprehensive Sewer Master Plan. Ashland’s Water Quality Trading Plan was accepted by the Oregon Department of Environmental Quality (DEQ) on March 9, 2018, as being consistent with Oregon’s Water Quality Trading Rule. The Water Quality Trading Plan will focus on implementing riparian re-vegetation and shading projects to generate “credits” to satisfy the City’s anticipated upcoming temperature obligation. The Freshwater Trust is under phase 1 contract to begin the program architecture and pilot shading projects. Phase 2 planting (construction) is anticipated for the fall of 2019 depending upon finalizing the DEQ NPDES permit.



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