OREGON WATER RESOURCE DEPARTMENT
WATER CONSERVATON, REUSE AND STORAGE
FEASIBILTY STUDY GRANT PROGRAM

I. Grant Information

Study Name: *Big Lake Youth Camp - Recycled Water Study*

Type of Feasibility Study: ☐ Water Conservation ☒ Reuse ☒ Above-Ground Storage
☐ Storage Other Than Above-Ground [Including Aquifer Storage and Recovery (ASR)]

Program Funding Dollars Requested: $ $4,250
Note: Request may not exceed $500,000

Total Cost of Feasibility Study: $ $8,500

II. Applicant Information

Applicant Name: ***Big Lake Youth Camp, Les Zollbrecht***		**Co-Applicant Name:**
Address:	*19800 Oatfield Rd.*	Address:
	Gladstone OR 97027	
Phone:	*503-850-3578*	Phone:
Fax:		Fax:
Email:	*les@biglake.org*	Email:

Principle Contact: ***Shawn Spargo, Kennedy/Jenks***	
Address:	*421 SW 6th Ave, Suite 1000*
	Portland, OR 97204
Phone:	*503-423-4000*
Fax:	
Email:	*shawnspargo@kennedyjenks.com*

Certification:

I certify that this application is a true and accurate representation of the proposed work for a project feasibility study and that I am authorized to sign as the Applicant or Co-Applicant. By the following signature, the Applicant certifies that they are aware of the requirements of an Oregon Water Resources Department grant, have read and agree to all conditions within the sample grant agreement and are prepared to conduct the feasibility study if awarded.

Applicant Signature: _____ Date: 2/1/16

Print Name: *Les Zollbrecht* Title: *Director*

III. Feasibility Study Summary

Please give a brief summary of the feasibility study using no more than 150 words.

Big Lake Youth Camp has operated on land leased from the National Forest Service since 1962. Wastewater from the camp operations is directed to an onsite recirculating gravel filter and leachfield operated under WPCF permit No. 980051. The study would determine if grey water from sinks, showers and laundry facilities could be separated ahead of the septic system and used for onsite irrigation. Use of recycled water would reduce the hydraulic loading on the gravel filter. One of the main cabins which houses hikers using the Pacific Crest Trail would be modified to divert grey water, recycle it by filtration, or similar technology to Class C standards. Water would be stored above ground and irrigated on native vegetation to promote growth of native plants during late spring through fall using drip and mirospray irrigation over roughly one-half acre to pilot the technology.

IV. Grant Specifics

Section A. Common Criteria

Instructions: Please answer all questions contained in this section. It is anticipated that completed applications will result in additional pages.

1. Describe your goal and how this study helps to achieve the goal.

   The goal is to determine the feasibility of implementing a recycled water program by addressing regulatory acceptance and physical treatment, storage and distribution of grey water. Phase 1 of this study will address permitting and preliminary design tasks to determine the feasbility of implementing a recycled water system at the Camp. Capital and maintenance costs and available engineering technologies will be assessed.

2. Describe the water supply need(s) that the proposed project addresses. Identify any critical local, regional, or statewide water supply needs that implementation of the project associated with the feasibility study will address. **Responses should rely upon solid water availability and needs data/analysis.** For examples of water supply needs see "Criteria and Evaluation Guidance Document."

   According to data on snow pack records from the USDA's National Water and Climate Center (NWCC), snowpack measurements were at record lows as recently as the end of January 2016. Obervation stations known by the acronym SNOTEL are used to monitor the snowpack. In the Oregon Cascades, the snow water content of the snowpack was less than 20 percent of average as of Feb. 9 of this year. At the Santiam Junction SNOTEL (the nearest station to Big Lake Camp), the snow water content was zero on Feb. 1. In records dating back to 1979, it's been this low only on this date one other time. While conditions since February have improved for 2016, drought conditions have been pervasive in 2014 and 2015. According to the Oregon Climate Change Research Institute, by mid-century, Cascade snowpacks are projected to be less than half of what they were in the 20th century, with lower elevation snowpacks being the most vulnerable. The Camp relies on surface water recharge from snowpack for it's potable water supply, including water used for onsite irrigation. Implementation of a reclaimed water system will offset surface water withdrawl rates. In addition, separation of recycled water will reduce the hydraulic loading on the Camp's onsite wastewater treatment system

3. Explain how the proposed project will meet the water supply need(s), and indicate what percentage of that need will be met. (For example: If your water supply need is 20,000 acre-feet of additional water and the project will supply 10,000 additional acre-feet, 50 percent of your need will be met).

   Onsite irrigation at the camp is assumed to be minimal (roughly 2% of the Camp's water use). The current average water use is approximatly10,500 gpd. The irrigation water demand is estimated at 210 gallons per day. An initial estimate of recycled water in terms of grey water available from the main hiker cabin is 200 gallons per day. This will nearly meet the current demand for irrigation water used onsite at 95% of current demand. Reclaimed water could be used for forest land reclamation. Native forest land in reestablishment areas can require from 0.01 - 0.04 gallons/square foot/day assuming drip irrigation is used. 200 gallons per day could support reclamation of one-quarter to one-half of an acre of forest land.

4. Describe the technical aspects of the feasibility study and why your approach is appropriate for accomplishing the specific study goals and objectives.

   Kennedy/Jenks Consultants (K/J) is a civil engineering firm based on the west coast, and for over 95 years, we have been working to solve water issues for both private and municipal clients. With over 420 engineers, scientists and environmental professionals, we bring a broad knowledge base to water projects with environmental policy, permitting, design and construction aspects. This feasibility study will gain regulatory acceptance by following state and federal permitting guideance documents. Established engineering practices for treatment and hydraulics will govern planning for the recycled water system. In addition, the technical aspects of storage, treatment and conveyance/distribution will be evaluated to select methods best suited to this

project. The end result of the feasbility study will be to have a shovel-ready project with a path to regulatory acceptance and complete predesign for the Big Lake Camp to proceed with field implementation of their recycled water project.

5. Describe how the feasibility study will be performed. Include:
    a. General summary statement that describes the study progression.
    b. When the feasibility study will begin.
    c. Listing of key tasks to be accomplished with each task having:
        i. Title
        ii. Timeline for completion
        iii. Description of the activities to be performed in this key task
        iv. Description of the resources necessary for accomplishing the key task

    Example:

    (i) Streamflow measurement;
    (ii) September-April;
    (iii) Weekly streamflow measurements will be performed to gather hydrographic data for the hydrologic analysis to take place in May;
    (iv) A technician will be hired to perform the streamflow measurements.

    (Key tasks listed here are to be placed in Section VI. Project Feasibility Study Schedule for a quick reference "graphical" representation of the schedule.)

a. Determine permitting and regulatory submittals required for project acceptance, develop design criteria for the project, and finally design recycled water treatment, storage and distribution systems.

b. The feasiblity study will begin following confirmation from OWRD that the project is eligble for funding. Permitting taskswill be accomplished by May. Preliminary design tasks will be completed by July. The scheduled can slide depending on the timing of grant funding, without major impact to construction. Final design and construction will be completed in fall of 2016, for operation in the summer of 2017.

c. List of feasibility study tasks:

1. Permitting and Regulatory Tasks 3/1/16 - 4/30/16

i. Kickoff Meeting: Meet with applicant/owner, tour existing facilities and discuss project details

ii. 3/1/16

iii. Take photographs of the cabin and plumbing to be modified and the areas where recycled water will be applied. Measure piping distances and estimate system elevations for the cabin and the area to be irrigated. Determine viable locations for treatment and storage systems (assumed to be near the cabin).

iv. Engineering staff, recycled water permitting specialist and Big Lake Camp staff.

2. Permitting: Determine USFS regulatory requirements specific to the project.

i.Meet with U.S Forest Service environmental staff at Big Lake Camp

ii. 3/1/16

iii. Discuss USFS best management practices(BMPs) as they apply to reclaiming forest land and irrigation with reclaimed water. Determine any treatment criteria, application periods (assumed to

be late spring through fall growing season) and recommended irrigation rates that will align with USFS policies.

iv. USFS permit coordinator and/or land use specialist. K/J recycled water permitting specialist

3. Determine Oregon Department of Environmental Quality (DEQ) regulatory requirements.

i.Telcon or meeting with Oregon DEQ (Dan Wiltse) at DEQ's office in Eugene.

ii. 3/7/16

iii.Discuss if a Recycled Water Use Plan or Grey Water General Permit is required for application of Class C reclaimed water on federally leased land. Determine setbacks from irrigation area for microspray irrigation and signage required. Assess water quality, annual testing and reporting requirements as they relate to the proposed facility.

iv. DEQ reuse program permit coordinator, K/J recycled water permitting specialist.

4. Draft Permit Applications/Regulatory Acceptance Documents

i.K/J to submit system information and permit applications for design, construction and operation for Phase I of the Camp's recycled water system. Draft a Recycled Water Use Plan or Grey Water General Permit as required and submit to DEQ for review.

ii. 3/10/16 to 4/30/16

iii. K/J to submit system information and permit applications for design, construction and operation for Phase I of the Camp's recycled water system. Draft a Recycled Water Use Plan or Grey Water General Permit if required and submit to DEQ, ODWR and Big Lake staff for review. Receive comments and finalize the Plan.

iv. K/J recycled water permitting specialist.

5. Preliminary Engineering Task 1.

i.Quantify recycled water system flowrates to size system components.

ii. 3/7/16 to 6/1/16

iii. Perform hydraulic analysis using field data collected. Estimate cabin use and recycled water rates. Preliminary estimates of grey water separated for treatment will be confirmed by flow measurements made during an average week in May. Preliminary estimates of recycled water flow during the irrigation season are 200 to 300 gallons per day.

iv. K/J engineering staff and rental flow measurement equipment with datalogger installed on cabin plumbing system

6. Preliminary Engineering Task 2.

i. Predesign Technical Memorandum and Opinion of Probable Cost. Identify available treatment technologies to accomplish water quality, storage and distribution goals. Rank these in terms of performance in this application, number of successful installations, capital and operating costs. Provide a preliminary plan for recommended alternative. Allow 2 weeks for ODWR and Camp staff to review the predesign technical memo and comment on recommended system.

ii. 5/1/16 to 6/30/16. Complete on parallel path with Preliminary Engineering Task 1.

iii. Research proven small-scale treatment technologies for water treatment, storage and distribution. System must be designed to be drained in the winter to prevent freezing when not in use. System will be operated by Camp staff and must operate with minimal operator intervention and required maintenance.

iv. K/J engineering staff.

Phase 2 will include final design, construction and system startup. Phase 2 will follow successful completion of Phase 1 and is scheduled for fall of 2016 and summer of 2017. The system is proposed to operate annually during the irrigation system beginning in summer of 2017.

6. Please provide the following data and information for the proposed project and the project's sources of water supply:

   a. The location of the proposed project. Include the basin, county, township, range and section. Attach a **map** that identifies the project's implementation area to this application.

      See Attachment 1 - Vicinty Map and Attachment 2 - Site Plan.

   b. The name(s) and river mile(s) of the source water and what they are tributary to, if applicable.

      Source water is directly attributed to groundwater supplied via aquifer recharge from snow pack.

   c. Whether the project will be off-channel or on-channel (for above-ground storage only).

      Off-channel storage is proposed in a small above-ground tank/reservoir. Preliminary size is less than 1,000 gallons of treated water storage.

   d. Water availability to meet project storage. For above-ground storage the Department typically evaluates availability using a 50 percent exceedance water availability analysis.

      Water availability was estimated from building occupancy and is based on standard per capita water consumption rates. Showers, restroom sinks and laundry will be the primary sources of grey water for recycling.

   e. Proposed purposes and/or uses of conserved or stored water.

      Stored water will be used exclusively for irrigation and plant establishment for forest reclamation.

   f. Environmental flow needs and water quality requirements of supply source water bodies.

      None. The source of water will be entirely from recycled water.

7. What local, state or federal project permitting requirements/issues/approvals do you anticipate in order for the feasibility study to be conducted? If approvals are required, indicate whether you have obtained them. If you have not obtained the necessary permits/governmental approval, describe the steps you have taken to obtain them. If no permits are needed, please provide explanation.

   Either a grey water general permit or recycled water use permit will be required by the Oregon DEQ as described above. Permissions will likely be required from the National Forest Service, however, the USFS does not have a formal permitting process for use of reclaimed water on federal lands.

8. Describe the level of involvement, interest and/or commitment of local entities associated with the feasibility study. Describe how the feasibility study and/or proposed project will benefit/impact these entities. Attach letters of support if available.

   Big Lake Youth Camp supports this feasibility study as it supports the Camp's sustainability goals as stewards of the natural environment at the facility. The recycled water system will serve as an educational tool for camp youth. An informative display detailing the operation of the recycled water system will explain the use of the recycled water system and positive impacts it has on the opeation of the Camp.

9. Identify when matching funds will be secured, from whom, and the dates of matching funds availability.

Matching funds will be secured from the Camp's 2016 operating budget. Les Zollbrecht can be contacted directly as to the source of these funds. Funds will be available immediately upon confirmation of grant funding from OWRD.

10. Provide a description of the relevant professional qualifications and/or experience of the person(s) that will play key roles in performing the feasibility study. If the personnel have not been decided upon, include a description of the professional qualifications and/or experience of the person(s) you anticipate will play key roles in performing the feasibility study.

    See Attachment 3: Resumes for key K/J personnel dedicated to this project.

    Mr. Stuart Childs Ph.D., R.G. - Senior Recycled Water Specialist;

    Mr. Shawn Spargo, P.E.- Project Engineer; and

    Ms. Alice Robinson - Environmental Staff

11. If the project concept is ultimately deemed feasible, describe how the project will be implemented. Response should include a tentative funding plan for project implementation (e.g. other state or federally sponsored grant or loan programs) and the project proponent's track record in implementing similar projects.

    The estimated cost of design and construction of Phase 2 of this project, including final design, constrution and facility startup, will be paid for with a combination of grants, cash and in-king labor. The prelimary budget range is $16,000 to $20,000 and includes all system components, permitting, labor and operation for the first irrigation season. Big Lake Youth Camp intends to apply for additional grant funding if the Phase 1 Feasibility Study is successful. Kennedy/Jenks as a long history of successful project completion for clients and our water system reference projects are available upon request. Major water system improvements have recently been completed for the cities of Gearhart, Woodburn, Newberg, Scappoose and Hermiston in Oregon.

Section B. Unique Criteria

Instructions: Address the set of items below that applies to the type of feasibility study that this grant will fund.

☐ Water Conservation or ☒ Reuse

1. Water Conservation or Reuse projects that are identified by the Department in a statewide water assessment and inventory receive a preference in the scoring process. Contact the Department's Grant Specialist to include your project on the inventory.
   This project is not yet listed on the inventory.

2. Explain how the associated project will either: (a) mitigate the need to develop new water supplies and/or (b) use water more efficiently. Reference documentation and/or examples of the success of similar or comparable water conservation/reuse projects that would be available upon request.

   Reusing water for restoration will lessen the use of potable water for irrigation by approximately 200 gpd. Refer to project descriptions on resumes in Attachement C for similar successful projects.

3. Provide a description of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area. If permitting or other approvals are not needed please indicate and provide an explanation.

The project will need US Forest Service permission to construct the system as the land is leased. The feasibility study will determine the permitting requirements of the USFS as they relate to construction and maintenance of a recycled water system for forest reclamation.

☒ Above-Ground Storage

Please answer the following three questions **BEFORE** proceeding:

Will the project divert more than 500 acre-feet of surface water annually?	☐ Yes	☒ No
Will the project impound surface water on a perennial stream?	☐ Yes	☒ No
Will the project divert water from a stream that supports sensitive, threatened or endangered species?	☐ Yes	☒ No

If you answered "Yes" to any of these questions, by signature on this application, you are committing to include the following required elements in your feasibility study.

Describe how you intend to address the required elements in your feasibility study:

a) Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows.

b) Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives.

c) Analyses of environmental harm or impacts from the proposed storage project.

d) Evaluation of the need for and feasibility of using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values.

Is the proposed storage project for municipal use?

☐ Yes ☐ No

If "Yes," then please describe how you intend to address the following required element in your feasibility study:

e) For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project's relationship to existing and planned water supply projects.

Proceed in addressing the following items:

1. Describe to what extent the project associated with the feasibility study includes provisions for using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life or other ecological values. Projects that include the above provisions receive preference in the scoring process.

2. Provide a review of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area.

☐ Storage Other Than Above-Ground [Including Aquifer Storage and Recovery (ASR)]

Please answer the following three questions **BEFORE** proceeding:

Will the project divert more than 500 acre-feet of surface water annually?	☐ Yes	☐ No
Will the project impound surface water on a perennial stream?	☐ Yes	☐ No
Will the project divert water from a stream that supports sensitive, threatened or endangered species?	☐ Yes	☐ No

If you answered "Yes" to any of these questions, by signature on this application, you are committing to include the following required elements in your feasibility *study.*

Describe how you intend to address the required elements in your feasibility study:

a) Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows.

b) Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives.

c) Analyses of environmental harm or impacts from the proposed storage project.

d) Evaluation of the need for and feasibility of using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values.

Is the proposed storage project for municipal use?

☐ Yes ☐ No

If "Yes," then please describe how you intend to address the following required element in your feasibility study:

e) For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project's relationship to existing and planned water supply projects.

Proceed in addressing the following items:

1. Underground storage projects that are identified by the Department in a statewide water assessment and inventory receive a preference in the scoring process. Contact the Department's Grant Specialist to include your project on the inventory.

2. Provide a review of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area.

V. Match Funding Information

Applicants must demonstrate a minimum dollar-for-dollar match based on the total funding request. The match may include a) secured funding commitment from other sources, b) pending funding commitment from other sources, and/or c) the value of in-kind labor, equipment rental, and materials essential to the feasibility study. For secured funding, you must attach a letter of support from the match funding source that specifically mentions the dollar amount shown in the "Amount/Dollar Value" column. For pending resources, documentation showing a request for the matching funds must accompany the application.

In the "type" column below matching funds may include:	**In the "status" column below matching funds may have the following status:**
• **Cash** - Cash is direct expenditures made in support of the feasibility study by the applicant or partner*.	• **Secured** - Secured funding commitments from other sources.
• **In-Kind** - The value of in-kind labor, equipment rental and materials essential to the feasibility study provided by the applicant or partner.	• **Pending** - Pending commitments of funding from other sources. In such instances, Department funding will not be released prior to securing a commitment of the funds from other sources. Pending commitments of the funding must be secured within 12 months from the date of the award.

*"Partner" means a non-governmental or governmental person or entity that has committed funding, expertise, materials, labor, or other assistance to a proposed project planning study. OAR 690-600-0010.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	**Type** (✓ One)	**Status** (✓ One)	**Amount/ Dollar Value**	**Date Match Funds Available** *(Month/Year)*
Big Lake Youth Camp	☒ cash ☐ in-kind	☒ secured ☐ pending	*$4,250*	*March 16*
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		

VI. Feasibility Study Schedule

Estimated Study Duration: March 1, 2016 to July 1, 2016

Place an "X" in the appropriate column to indicate when each Key Task of the project will take place.

	2016			2017				2018 & Beyond
Feasibility Study Key Tasks	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	
1. Phase 1 Kickoff Meeting	X							
2. Permitting USFS	X							
3. Permitting ODEQ	X							
4. Draft Permit Applications		X						
5. Preliminary Engr. Task 1 -Hydraulic Analysis		X						
6. Preliminary Engr. Task 2 -Predesign Tech Memo		X						

- **Please Note**: Successful grantees must include all invoices and identify which key tasks are associated with each invoice when requesting financial reimbursement.

VII. Feasibility Study Budget

Section A

Please provide an estimated line item budget for the proposed feasibility study. Examples would include: labor, materials, equipment, contractual services and administrative costs.

Line Items	Number of Units* *(e.g. # of Hours)*	Unit Cost *(e.g. hourly rate)*	In-Kind Match	Cash Match Funds	OWRD Grant Funds	Total Cost
Staff Salary/Benefits						
Contractual/Consulting	*52.5*	*$155.00*		*$3,887*	*$4,250*	*$8,137*
Equipment (must be approved)						
Supplies						
Other: Travel Expenses, Mileage	*460*	*$0.55*		*$253*		*$253*
Meals	*1*	*$109.00*		*$109*		*$109*
Administrative Costs**						
Total for Section A				*$4,250*	*$4,250*	*8500*
Percentage for Section A				***50***	***50%***	***100%***

** Note: The "Unit" should be per "hour" or "day" – not per "project" or "contract."* *Units x Unit Costs = Total Cost*
*** Administrative Costs may not exceed 10 percent of the total funding requested from the Department*

Section B

If grant amount requested is $50,000 or greater, you MUST complete Section B. Key Tasks in Section B should be the same as the Key Tasks in Section VI (Feasibility Study Schedule).

Feasibility Study Key Tasks	In-Kind Match	Cash Match Funds	OWRD Grant Funds	Total Cost
Total for Section B				

Totals in Section B must match the totals in Section A

APPLICATION CHECKLIST

Instructions: Use this checklist to ensure that your application is complete. An incomplete application will jeopardize your application's review. **<u>This form does not need to be included in your application packet.</u>**

General

If submitting electronically, the preferred format is either a Microsoft word or Adobe pdf

- ☒ Only one application is included with the packet (other applications must be sent separately).

Paper submissions only

- ☐ The application and attachments are on 8 ½" x 11" paper.
- ☐ The application and attachments are single-sided.
- ☐ The application and attachments are not stapled or bound.

Section I – Grant Information

- ☒ All questions in this section have been answered.
- ☒ The Grant Dollars Requested and the Total Project Cost mirror the totals shown in Section VII.

Section II – Applicant Information

- ☒ All contact information for the applicant(s) and fiscal officer is complete and current.
- ☒ The certification is signed by an authorized signer.

Section III – Feasibility Study Summary

- ☒ A brief summary, of no more than 150 words, is complete.

Section IV – Grant Specifics

- ☒ All questions in Section A have been answered.
- ☐ If the type of feasibility study is water conservation, reuse or storage other than above-ground, you have contacted the Department and requested project be added to the Oregon Water Resources Department's statewide water assessment and inventory.
- ☒ All applicable questions for the type of grant requested have been answered.

Section V – Match Funding Information

- ☒ Applicant has identified that at least 50 percent match has been sought, secured or expended.
- ☐ Letters of support are included for "secured" match funding sources.
- ☐ Documentation is included for "expended" match funds.
- ☒ Documentation is included for "pending" match funds.

Section VI – Feasibility Study Schedule

- ☒ Estimated project duration dates have been supplied.
- ☒ All Key Tasks of the project are listed.

Section VII – Feasibility Study Budget

- ☒ Section A is complete.
- ☒ Administration costs do not exceed 10 percent of the requested OWRD Grant Funds.
- ☐ If grant amount requested is $50,000 or greater, Section B has been completed.
- ☐ All Key Tasks listed in Section B mirror the Key Tasks listed in Section VI.

ATTACHMENT A – VICINITY MAP

Google earth

miles 9

km 10

ATTACHMENT B – SITE PLAN

Proposed 1/2 acre irrigation area. Estimated irrigation rate is approximately 8 gallons per hour.
75.38 ft
50.00 ft
Summer Hiker Cabin. Source of Recycled Water
Measure distance
Total distance: 75.38 ft (22.98 m)
Click on the map to add to your path

ATTACHMENT C - RESUMES

Stuart Childs, Ph.D., R.G.

Senior Recycled Water Specialist

Education

Ph.D., Soil Science, Washington State University, 1980

M.S., Soil Science and Biometeorology, Utah State University, 1975

B.S., Geology, Stanford University, 1971

Registrations

Oregon Registered Professional Geologist No. G1211, 1992

Washington Registered Professional Geologist No. 1593, 2002

Professional Summary

Stuart Childs is a soil scientist and hydrogeologist with over 30 years of experience, including 10 years as a research professor at Oregon State University. Dr. Childs' works extensively with irrigation of recycled water and wastewater with a focus on groundwater protection. His areas of expertise include soil/unsaturated zone measurements, hydrology of irrigation and land application sites, wastewater management, groundwater - surface water interactions, and soil science/agriculture. Stuart has specific expertise in soil water management, irrigation scheduling for groundwater protection, and water and nutrient recycling via land application for industries, municipalities and large agricultural operations. Of special note are Stuart's expertise in soil salinity, nitrogen management, waste management, and recycling via land application.

Project Experience

Food Processing Wastewater Management

Co-authored the Manual of Best Practices for Land Application of Process Rinse Water (Brown and Caldwell and Kennedy/Jenks Consultants, 2012) in cooperation with the California League of Food Processors.

Technical lead for detailed field studies of winery wastewater discharge to develop best management practices BMPs for the (Kennedy/Jenks. 2004. Land Application of Winery Stillage and Non-Stillage Process Water: Study Results and Proposed Guidelines. Prepared for the Wine Institute of California. August 2004.)

Conducted antidegradation analyses for eleven wastewater land application projects since 2008. These projects couple detailed evaluations of cropping and irrigation management strategies to limit percolation of water, salt and nutrients below the crop root zone. The projects provide irrigation management strategies and protocols that results in protection of underlying groundwater. These documents are submitted to regulatory agencies as part of developing discharge permits and monitoring requirements.

Recycling Programs for Treated Municipal Effluent

Dr. Childs has completed effluent reuse irrigation projects in Oregon for Camp Rilea Military Training Facility (Warrenton, Oregon), Silver Falls State Park, and Clean Water Services in Hillsboro, as well as a number of smaller municipalities in Oregon, Washington, and California. Recent examples of projects completed are:

Tesoro Viejo Master Planned Community, Madera County, California. Kennedy/Jenks prepared a Report of Waste Discharge describing three phases of construction of a wastewater treatment plant to produce tertiary treated recycled water. As part of the project evaluation, water balances were developed to evaluate the recycled water storage requirements. The water balances also established irrigation water requirements and irrigation scheduling for agricultural crops as well as turf grass and ornamental vegetation within the development. The irrigation management program was designed so that percolation of water and solutes below the root zone would not degrade underlying groundwater quality. The discharge permit based on Kennedy/Jenks' analysis is scheduled for adoption by the California Regional Water Quality Control Board in June 2016.

Evaluation of the Impacts of Recycled Water Irrigation on Greens and Turf at the Willows Run Golf Course, King County Washington. Kennedy/Jenks was retained by the King County Department of Natural Resources and Parks, Wastewater Treatment Division to evaluate potential impacts of irrigation of a golf course with tertiary treated municipal effluent from their Brightwood Treatment Facility. Staff at the golf course were concerned that some constituents, including sodium were increasing in the soil. Kennedy/Jenks evaluated the potential impacts and developed a monthly soil sampling program to evaluate the long term effect of irrigation solely with recycled water. The results of the sampling program were evaluated and it was determined that the recycled water was of benefit to the golf course. During the project, Kennedy/Jenks worked closely with both King County and golf course personnel to strengthen their collaborative relationship and protect the soil resources at the golf course.

Discharge Permitting for Land Application of Treated Wastewater at the Camp Roberts California Army National Guard Training Facility, Paso Robles, CA. Kennedy/Jenks prepared a Report of Waste Discharge to support the National Guard's application for a discharge permit. Kennedy/Jenks evaluated the discharge from a new wastewater treatment facility and prepared an analysis of potential groundwater impacts at Camp Roberts which is adjacent to the Salinas River. Based on the analysis of the proposed irrigation and wastewater treatment facility plans, Camp Roberts received a wastewater discharge permit for their operations.

Recycled Water Management at Camp Rilea Military Training Facility near Warrenton, Oregon. Kennedy/Jenks has worked with the Oregon Military Department (OMD) for a number of years to develop and manage their wastewater discharges for irrigation. In 2012, OMD completed a recycled water treatment plant designed by Kennedy/Jenks so that tertiary treated recycled water could be used to irrigate turfgrass at the facility. During the non-

irrigation season, a rapid infiltration discharge facility was constructed so that treated effluent could be discharged in the sand dunes on the western portion of the Facility. Kennedy/Jenks continues to evaluate operating data for the recycled water treatment facility and groundwater in the vicinity of the rapid infiltration discharge facility. The two discharges continue to operate using recycling of treated effluent during the summers and rapid infiltration discharge without groundwater degradation.

Shawn C. Spargo, P.E.

Civil Engineer

Education

BS, Civil Engineering, Oregon State University, 1999

MS, Environmental Engineering, Oregon State University, 2000

Registrations

Professional Civil Engineer, Oregon (58959), Washington (52320)

Certifications

HAZWOPER Certification

Pipeline Assessment and Certification Program

Professional Summary

Shawn has more than 15 years of experience completing civil, environmental and water system improvements projects. He has coordinated scope, schedule and budget for numerous planning, design and construction projects. Shawn currently serves as client service manager for the City of Hermiston and for the Boeing Portland Commercial Aircraft Facility, among others. Shawn currently manages projects with a total engineering budget exceeding $4.5 million. Over the past eight years, his focus has been on projects involving water conveyance and surface water discharge, water treatment design and construction management. Recent projects include the $18 million City of Hermiston Recycled Water Plant Improvements Project, for which Shawn served as the Lead Civil engineer and process designer for the treatment facility; the $10 million City of Rainier, Oregon, Waste Water Treatment Plant Improvements Project, where Shawn produced detailed plans and specifications and coordinated an interdisciplinary team of engineers; City of Simi Valley, California, Critical Infrastructure Evaluation for recommendations in developing a portion of the city's capital improvement program; and the City of Amity, Oregon, Tertiary Filtration Project, including design and construction of a summer disposal and filtration system for land application of treated effluent at agronomic rates.

Experience

Kennedy/Jenks Consultants, Portland Oregon, 2003- Present

North Valley Reservoirs - City of Newberg, OR - *Project Manager* - After 40 years of service, repairs were necessary on two 4-million gallon, pre-stressed concrete potable water reservoirs nearing the end of their useful life. Evaluation of the reservoirs indicated the structural integrity had deteriorated and the reservoirs would not withstand a major earthquake. In addition, a lack of mixing was impacting water quality. Lead engineer on design documents and construction services for the project to extend the life of this vital infrastructure. Seismic retrofits combined with an evaluation of specialty coatings for repair of aging concrete and sealing of both roof and floor joints extended tank life at a fraction of the cost of new reservoirs. Designed two 12" mixing headers to NSF 61 standards, each over 100 feet in length.

Recycled Water Plant Improvements – City of Hermiston, OR - *Project Manager* - RWP improvements and retrofit of existing facilities for the 3 MGD plant. Included contract documents for two-miles of 24-inch diameter recycled water pipeline and two submerged outfalls and a Use Attainability Analysis to permit surface water discharge to a canal for

agricultural use. The Project also included Oregon DEQ review of the design for a membrane bioreactor, documentation for revisions to their existing NPDES permit, new equipment upgrades to plant equipment to meet stringent water quality criteria, and a Joint Permit for in-water work. Management of a 16-member multi-disciplinary engineering team and design/construction management budgets of nearly $3 million.

Wastewater System Improvements, City of Rainier, OR - *Project Engineer* - WWTP expansion and upgrade of existing facilities for the 1 MGD plant. $10 million upgrade to increase capacity and improve effluent quality. Pre-design report for review by Oregon DEQ and an ODOT encroachment permit for collection system improvements. Included drawings and specifications for a major treatment plant upgrade, 900 feet of 24-inch directional drilled HDPE outfall pipeline and permitting for surface discharge to the Columbia River. The project also included collection system rehabilitation, surface restoration with native plantings, erosion control permitting, and assistance in developing a monitoring program for the associated NPDES permit. Engineering budget of $1.2 million.

Server Farm Cooling and Storm Water Management Plan, Umatilla, OR – *Project Engineer*- Planning and design for management of up to 1.5 MGD of cooling water and site storm water for a major online retailer located in Umatilla Oregon. The facility initially made one pass with cooling tower blow down and discharged directly to the city sewer system. Facility planning evaluation for future expansion and management of spent cooling water, including; reduction and recycling treatment alternatives; infiltration/evaporation ponds for recharge; land application to nearby wetlands; and onsite storm water detention and treatment. The design included pumping facilities and onsite management of cooling water using a detention pond and spray evaporation system. Onsite stormwater design consisted of a network of grassy swales and a detention pond.

City Engineering Services, City of Oregon City, West Linn and Scappoose - *Project Engineer* - Providing design and development review services for multiple municipalities. Completeness checks, storm drainage reports, and design reviews were completed for the planning and development, and building departments for each municipality. Design reviews include preliminary check of plans for completeness and accuracy of submittals in accordance with the applicable municipal standards. Discussion of reviews with city building and planning officials. Communication with developers and project engineers to efficiently determine project scope, coordinate deliverables and clarify required public improvements as a result of the project. Site visits to evaluate existing conditions and construction practices as needed.

Wastewater Collection System Rehabilitation Plan, City of Simi Valley, Simi Valley, CA – *Project Engineer* - Internal pipeline condition assessment using the Pipeline Assessment and Certification Program (PACP) sponsored by the National Association of Sewer Service Companies (NASSCO). A risk analysis was completed for 50 miles of interceptor gravity sewers up to 48-inch and used GIS to identify and prioritize sewer reaches for replacement. The findings of the risk analysis and PACP ranking system were linked to the existing GIS-based sewer atlas for use by the utility. Results of the analysis were utilized to develop a Capital

Improvements Plan including scope for the first $10 million in improvements to the collection system. Managed a multidisciplinary team of engineers and scientists to develop the GIS mapping tool. Total engineering budget of $500,000.

Biosolids Composting Facility- City of Arlington, WA – *Lead Design Engineer* - Engineering design and construction package for expansion of a municipal wastewater biosolids composting facility. $3 million dollar expansion to double capacity of the facility while maximizing the efficiency of the composting process. Equipment upgrades including: automated aeration equipment for aeration and temperature control, mobile compost mixing, and pile-building conveyor system. Expansion of storage capacity, stormwater detention and odor control facilities, and addition of improved biosolids and compost amendment storage.

Wastewater Treatment Evaluation - Indian Health Services – Redwood Valley Rancheria, CA – *Project Engineer* - The Rancheria serves approximately 150 people with a community wastewater system that consists of individual septic tanks, a standard gravity collection system, followed by a community drainfield with a dosing system. The drainfield failed due to high groundwater coupled with high loading rates. It was upgraded, and failed again. The land available for the drainfield and treatment is limited. A study was performed to determine the most effective combination of treatment and disposal. Alternatives reviewed for discharge included direct discharge to the Russian River, reuse, a mound system, and combinations of the three. The treatment options included recirculating gravel filter, wetlands, and MBR's. The recommended system was a recirculating gravel filter followed by a mound system.

The Source Group, Inc., Pleasant Hill California, 2001- 2003

Staff Engineer Pilot-testing, design and field implementation for successful soil remediation of former sand filter beds, by nutrient addition and land farming techniques, at an industrial complex in Warwick, RI. In situ oxidation of contaminants by direct injection of Fenton's reagent in a former drum disposal area.

Lawrence Livermore National Labs, Livermore California, 2000-2001

Environmental Engineer Design and testing of multiple, ex situ groundwater treatment facilities at an active weapons test facility in Tracy, CA. Experimental design to evaluate treatment system performance and long-term project feasibility for technologies including: fixed-film biological, activated carbon, ion exchange, and phytoremedial processes. Coordination of sample acquisition, analysis and documentation. Composition of facility evaluation reports procedures.

Proficiencies

Project scheduling in MS Project and Primavera; Autocad and Civil 3D drafting design; storm flow routing; stormwater detention and treatment design; Low Impact Development and Green Streets Design; both pilot and full-scale, in/ex situ aqueous treatment systems for contaminant removal; environmental sampling and monitoring plans; SPCC plans; and Mixing Zone Studies.

Alice K. Robinson

Staff Engineer

Education

BS, Physics, Biology, University of North Carolina, Chapel Hill, 2009

MS, Environmental Engineering, University of California, Irvine, expected 2016

Certifications

HAZWOPER Certification

Professional Summary

Alice has over three years of experience in the environmental engineering field. She has worked with municipal and industrial wastewater treatment facilities, both in research and consulting roles. Alice has conducted pilot studies of treatment trains for non-potable water reuse, including successful pilot testing that led to designation of a novel treatment system as meeting the conditions of California's Title 22 water reuse program. She also has extensive experience in the use of membrane filtration for the treatment and reuse of process water in industries including oil and gas production, food processing, and chemical production. In her current role, she applies her skills to a variety of industrial projects.

Project Experience

Title 22 Pilot Study – Los Angeles County Sanitation District - *Project Engineer* – Testing of a treatment train that combined biological treatment with physical filtration in a pilot study hosted by the Los Angeles County Sanitation District. Resulted in a new treatment technology receiving Title 22 Conditional Acceptance as a treatment system approved to provide water for non-potable reuse, including landscape irrigation.

Water Reuse in the Shale Gas Industry, US Department of Energy - *Project Engineer* – Grant-funded study of the use of a novel membrane filtration system for filtration of shale gas produced water for reuse in hydraulic fracturing operations. Conducted hands-on testing of equipment and served as the primary author of a report to the Department of Energy.

Use of Membrane Filtration for Treatment of Flue Gas Desulfurization Wastewater, Electric Power Research Institute - *Project Engineer* – Development and on-site pilot testing of a treatment system for flue gas desulfurization wastewater from the power plant industry. Conducted testing and authored the final report to the funding agency on project results.

Kennedy/Jenks Consultants
Engineers & Scientists

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1 February 2016

Jon Unger
Grant Specialist
Oregon Department of Water Resources
725 Summer Street NE, Suite A
Salem, OR 97301

Subject: Big Lake Youth Camp
Feasibility Study Grant Application

Dear Mr. Unger,

Enclosed is our Oregon Water Resource Department Water Conservation, Reuse and Storage Feasibility Study Grant Program application. This is a small project that is of great importance to Big Lake Youth Camp as they continually strive to reduce their impact on the natural environment. Please feel free to contact me at (503) 423-4041 should you have any questions regarding this application. Thank you for your considering this project.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

Shawn Spargo
Civil Engineer

Enclosure: Grant Application

cc: Les Zollbrecht, Director, Big Lake Youth Camp