



OREGON WATER RESOURCE DEPARTMENT WATER CONSERVATION, REUSE AND STORAGE FEASIBILITY STUDY GRANT PROGRAM

I. Grant Information

Study Name: Collective Action Aquifer Storage and Recovery in Alpine, Oregon

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: \$ 141,348
Note: Request may not exceed \$500,000

Total Cost of Feasibility Study: \$ 292,228

II. Applicant Information

Applicant Name: <i>Benton County Community Development</i>	Co-Applicant Name: <i>OSU Institute for Water and Watersheds</i>
Address: <i>360 SW Avery Avenue</i>	Address: <i>234 Strand Agricultural Hall, Oregon State University, Corvallis OR 97331-2208</i>
<i>Corvallis OR 97333</i>	
Phone: <i>541-766-6085</i>	Phone: <i>54-737-9918</i>
Fax: <i>541-766-6891</i>	Fax: <i>541-737-1887</i>
Email: <i>adam.stebbins@co.benton.or.us</i>	Email: <i>todd.jarvis@oregonstate.edu</i>

Principal Contact: <i>Adam Stebbins</i>
Address: <i>SEE ABOVE</i>
Phone:
Fax:
Email:

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: 1/29/16

Print Name: Adam Stebbins

Title: Natural Resources Coordinator

III. Feasibility Study Summary

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

The feasibility study will support development of technical solutions to 100+ years of documented water supply and quality issues in the rural area surrounding the community of Alpine, and support domestic well owners throughout the state of Oregon and beyond. Building on Aquifer Storage and Recovery (ASR) research and project work within the Southern Willamette Basin, the study will document the feasibility of mitigating seasonally changing well yields in low producing domestic "exempt" wells. Feasibility findings will inform domestic well owners, OWRD and others interested in developing small-scale ASR. Feasibility study goals include drilling test wells and utilizing existing domestic exempt wells for small scale ASR and water storage/quality monitoring. The

study will be documented through an OSU student produced video and manual, on the use of exempt ASR wells as an alternative small-scale method of storing recharge water in historically low-yielding wells with low natural recharge rate.

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 of Benton County Community Development and Oregon State University-Institute for Water & Watersheds is to successfully implement 'collective action' Aquifer Storage and Recovery (ASR) using test wells and domestic wells, resulting in an educational 'DIY' manual and video that can be utilized statewide by domestic well owners as an option for mitigating seasonal water shortages. The study will assess implementation of pilot-scale 'collective action' ASR within a willing community surrounding the rural community of Alpine, Oregon ASR. The study will use rainwater collected from rooftops based on best management practices and water treatment methods as outlined by Embleton (2012) within the Southern Willamette Basin.

The study builds on existing hydrogeologic and ASR research, to evaluate the feasibility of mitigating seasonally changing well yields in low producing exempt domestic wells, and inform well owners across the state, through the successful achievement of the following objectives:

- 1. Drill one (1) new test well and retrofit two (2) existing exempt domestic wells, and install treatment and ASR recharge technology (based on Embleton 2012 specifications), to increase input to the aquifer for the purpose of studying seasonal changes in aquifer storage;*
 - 2. Complete water level and quality monitoring using Oregon State University graduate/undergraduate students monitoring the small-scale ASR study wells;*
 - 3. Estimate aquifer storage via ASR within atypical (non-Columbia River Basalt) hydrogeology;*
 - 4. Support current and future sustainable rural development by modeling a method for providing a reliable groundwater supply;*
 - 5. Inform well owners across Oregon and the nation on the viability of small-scale ASR and community engagement, through the development of an education DIY manual and project video documenting all stages of the project and provided for free streaming online via the OSU video library. Student education also includes implementation of complimentary course work developed by OSU (see attachment).*
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."

Nearly all surface water in Oregon is fully allocated during summer months, resulting in the ever increasing use of groundwater wells. Regional water services are often seen as a placed-based answer for future water needs, given groundwater depletion of aquifers; however these partnerships are expensive, as well as risky, in light of anticipated disruptions in utility services from projected natural disasters and property owner disputes. The result is the construction of 'exempt' wells increasing significantly since the 1940s (OWRD IWRS) and with this trend Oregon local groundwater supply issues continue to increase.

The area surrounding the rural community of Alpine, Oregon provides a case study of rural groundwater supply and quality issues across the state, and an opportunity to study the feasibility of small-scale Aquifer Storage and Recovery (ASR) utilizing domestic wells in non-Columbia River Basalt hydrogeologic units. The area receives an average of 40 inches of rain per year (OWRD, 2013), with documented minimal recharge within the area due to low permeability and some downward percolation and are not replenished during periods of high precipitation

(USGS Water Supply Paper, 1974). The most common water quality problems within the Alpine area occur within the Marine Siltstones (Benton County Water Analysis, 2007). Depending upon site specific conditions, groundwater in this unit may contain elevated concentrations of naturally occurring salts, sulfates, iron and arsenic due to the depositional nature of the formation (USGS Water Supply Paper, 1974). This problem is amplified in areas where the local geology is of low permeability or lacks fractures, such that the downward percolation of rainfall to provide groundwater recharge is restricted. Examples of this problem occur along Bellfountain Road, and many areas west of Monroe. Water quality problems in this formation worsen with depth because of the natural low permeability of the formation. Due to the formation, once a well has encountered saline water, drilling deeper will not produce fresh water. Currently, there are only marginal opportunities for water in the Alpine area, with similar areas across the state, underlain by the Marine Siltstones, from relatively shallow wells (generally less than 100 feet) in locations where recharge from surface infiltration may occur (Benton County, 2007).

Due to a combination of increased development pressures and reduction in seasonal recharge, continued water supply and quality issues will occur. The number of rural residents turning to trucked-in water has steadily increased over the decades as domestic wells go dry in some or all seasons as documented by Benton County Planning Department.

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).

The proposed project will study the feasibility of mitigating rural water supply needs, by using exempt wells to develop local ASR in the Alpine area. Groundwater storage will be steadily increased using rainwater catchment and treatment study equipment, resulting in the enhancement of year-round supply and quality. The community will be engaged in collective action and shared learning activities, to study and document the feasibility that this form of ASR can have to enhance supply and quality during dry/low recharge periods when water demand increases. This type of work has already occurred in low yielding well areas south of Alpine, as a means to recharge the low producing aquifer with rainwater for later recovery.

The proposed pilot scale collective action ASR will use rainwater collected from rooftops using best management practices and water treatment methods as outlined by Embleton (2012). The estimated quantity of recharged water approached 30,000 gallons in past study work, and given the hydrogeology in the Alpine area, it is reasonable to assume a comparable quantity of recharge water per well. The project goal is to engage 3 landowners in the feasibility study with estimated water needs of ~60,000 gallons per year average. The current deficit of water supply is ~16,000 per household based on recent trucked water data, during July-October. It is estimated that rainwater catchment systems will collect and store ~20,000 gallons (given 1,000 sq. ft. roof area and average rainfall intensity duration), providing ample supply for small scale ASR recharge.

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

The project team will complete a feasibility study of seasonal changes in the output of Alpine area aquifers by working directly with individual exempt domestic well owners in the area. Oregon State University researchers and Benton County staff will work with well owners based on existing willingness and water supply issues, to study (1) the timing of seasonal inadequacy of wells using the currently-installed pumping equipment; (2) Test existing pumping equipment, and installation of lower capacity pumping equipment to evaluate aquifer response; and (3) Complete monitoring of the performance of the retrofitted well through and test well using totalizing flowmeter and water level sounding device such as an airline, well sounder, or pressure transducers. Water quality testing will also be completed for all research wells to evaluate compliance with drinking water standards. This study approach is appropriate to achieve study goals and objectives noted in #1, as it provides characterization of the aquifer and the determination of collective action ASR enhancement impacts on this groundwater resource. Applied research level data collection and sharing is a priority for the project team, to inform community residents, OWRD, and well owners statewide.

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. After successful grant approval, Benton County and OSU team members will complete drilling of test well and engagement of the Alpine community. After site selection and initial study prep occurs, the materials and services and begin purchasing and install of rainwater catchment and monitoring study devices. Well supply and water quality data will be collected over 16 months to develop sufficient data for a trends analysis, to inform the community and well owners and regulators across the state. All stages of the process will be filmed for sharing feasibility for others to complete similar projects.

b. Project work starting with focused community engagement will begin immediately after announcement of grant award including: priority well owner participants, South Benton Citizen Advisory Committee, and Benton County Board of Commissioners

C. Key Tasks:

#1

- i. OWRD Grand Award/Acceptance; Finalize grant project implementation plan schedule, budget, and specific details;*
- ii. March-April 2016*
- iii. Finalize grant project implementation plan schedule, budget, and specific details;*
- iv. Begin engagement of students with sufficient ability to complete monitoring work.*

#2

- i. Secure well drillers, storage and pump system installers, and student researchers*
- ii. April-May 2016*
- iii. Meet with local businesses to determine estimated costs and evaluate student needs to complete educational aspects of feasibility study, while completing monitoring work.*
- iv. Quotes confirmed with contractors and agreements reached with students*

#3

- i. Develop community process to engage Alpine area*
- ii. April-May 2016*

- iii. *Determine specific properties for project implementation for test well and well retrofits from existing landowner pool (1 confirmed and over 12 interested in participating). Reach community understanding and increase support and information sharing.*
- iv. *Access agreements completed with willing landowners, and community understanding of feasibility project gained.*

#4

- i. *Complete test well drilling and well retrofits*
- ii. *April-June 2016*
- iii. *Complete drilling of 1 test well, 2 well retrofits; pump and monitoring equipment installation, and small scale ASR system installations*
- iv. *Gain contracts and complete feasibility monitoring work to project specifications, to allow for educational equipment installation and monitoring. Oversee contractors and students to ensure proper feasibility equipment install. Also includes securing OWRD start card for test well, and an administrative approval from ODEQ.*

#5

- i. *Complete rainwater storage and gravity infiltration to well*
- ii. *October-June 2017*
- iii. *Use above ground and below ground storage systems, and transfer of water to aquifer to study enhancements to Embleton approach (2012).*
- iv. *Project leaders and contractors Ensure all collection and pretreatment is adequate to complete feasibility study of small scale ASR, including recharge of wells. This includes confirmation and documentation of proper construction, securing necessary permits and QA/QC of well level/recharge monitoring.*

#6

- i. *Complete recovery of stored water*
- ii. *October 2016-September 2017*
- iii. *Using existing and newly drilled well systems, along with rainwater catchment systems, study of recharge rate and corresponding well levels will be assessed.*
- iv. *Students and leaders will monitor well ability to receive and store water and how this changes as water is withdrawn from the systems.*

#7

- i. *Complete Year 1 monitoring and equipment maintenance for small scale ASR systems*
- ii. *April 2016-September 2017*
- iii. *Study goals will include static well level monitoring pre and post recharge, pumping rates, storage amounts, and recharge data.*
- iv. *Students and contractors will complete monitoring per project leaders specifications. All work will be documented to allow for determination of feasibility on other sites.*

#8

- i. *Complete quarterly community meetings in Alpine area*
- ii. *March 2016-October 2017*
- iii. *Provide project updates and provide information for collective community ASR action*
- iv. *Facilitation led by Chris Bentley and Dr. Todd Jarvis, with findings and documentation of study information shared with community and their reaction will be documented.*

#9

- i. *Video documentation of feasibility study*
- ii. *March 2016-October 2017 (available for use beyond project end date)*

- iii. *Film and edit entire process for education of all interested domestic well owners*
- iv. *Student utilizes OSU-Institute for Water & Watersheds videography equipment to document priority information including landowner interviews, community engagement, well and catchment study system installation, monitoring goals and findings, and other important lessons learned.*

#10.

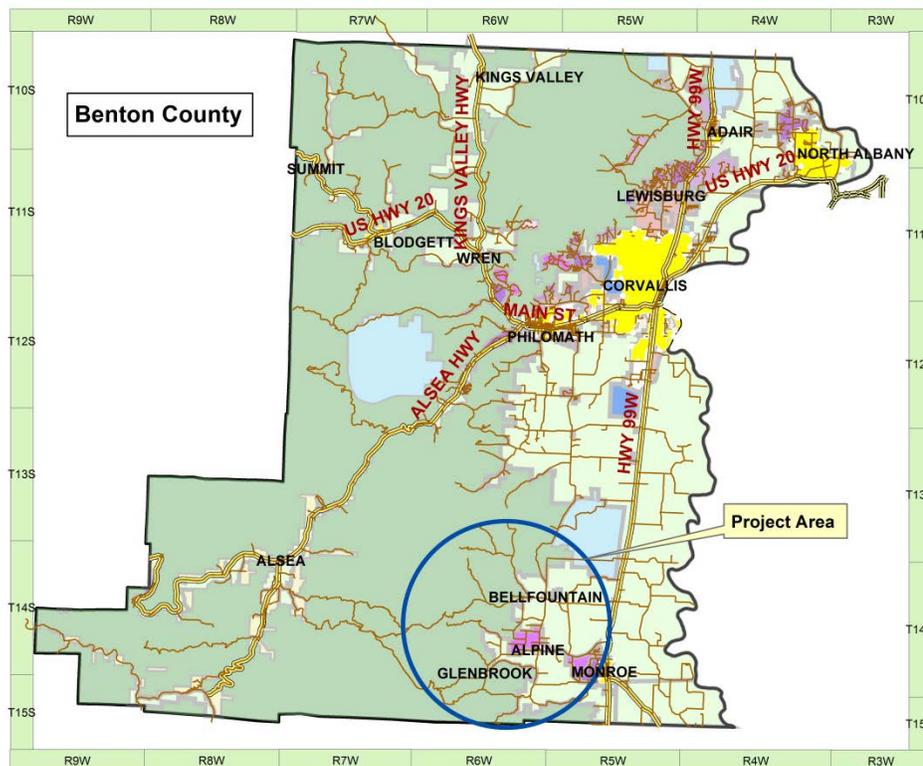
- i. *Do It Yourself (DIY) documentation*
- ii. *March 2016-October 2017 (available for use beyond project end date)*
- iii. *All stages of feasibility study for informing domestic well owners statewide will be captured in an education manual designed for homeowners.*
- iv. *Students and project leaders work with contractors to design manual, with OSU providing graphics and editing support.*

#11

- i. *Wrap up community meeting and project completion report*
- ii. *September-October 2017*
- iii. *Final community meeting overviewing all feasibility study findings and showing of video.*
- iv. *Facilitation led by Chris Bentley and Dr. Todd Jarvis, with findings and documentation of study information shared with community and their reaction will be documented. Lessons learned will be captured and shared in final report developed by project leaders*

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.



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

NA

- c. Whether the project will be off-channel or on-channel (for above-ground storage only).
NA
- d. Water availability to meet project storage. For above-ground storage the Department typically evaluates availability using a 50 percent exceedance water availability analysis.
NA
- e. Proposed purposes and/or uses of conserved or stored water.
Domestic water supply
- f. Environmental flow needs and water quality requirements of supply source water bodies.
NA

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.

The feasibility study will require OWRD inspection and issuance/approval of up to 3 well logs. The Oregon DEQ will need to provide application approval of 'Underground Injection Control', to allow for gravity feed of collected rainwater into domestic wells. After approval of grant award, the project team will secure approvals and inspections after completion of well construction and retrofits.

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.

There are 6 local organizations including cash and in-kind match from the Benton County Board of Commissioners, and in-kind match from OSU-Institute for Water and Watersheds, and confirmed interest from 1 local well owner and 5 more interested as part of the Benton County South County Citizens Advisory Committee (focused on groundwater supply issues as a primary work item). There is also interest that the study will provide information to inform new water groundwater supply alternatives across the state, while informing well owners and educating the next generation of water professionals. Regional groundwater professionals also support the study to help inform ongoing water issues and policy disputes as noted in local newspaper articles:

http://www.gazettetimes.com/news/local/water-worries-drive-alpine-dispute/article_f5ba918e-8665-53e6-a173-a02fe2568cb2.html

http://www.gazettetimes.com/news/local/scaled-back-alpine-subdivision-moves-ahead/article_70300679-2c11-5d53-bb1a-4d3a7e4bfecf.html

Specifically, hydrogeologist Ralph Christensen (EGR associates) supports the study of the Alpine area to study groundwater and inform his suggestion that sometimes wells start to run slow over time “because they get pumped too fast.” (Gazette Times article 2015).

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

\$45,068 cash match secured from Benton County Board of Commissioners immediately after grant proposal approval

\$55,960 in-kind will be secured over the term of grant from Benton County departments as work is performed

\$18,000 and \$8,000 will be realized as in-kind match for the use value of establishing monitoring equipment within existing domestic wells on private landowners property (per current costs for well drilling and estimated pump installation costs)

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.

Adam Stebbins, Benton County Natural Resources Coordinator, has 8 years of local and regional experience in water resources management and community engagement, and led successful implementation of a 2014 Feasibility Study funded by OWRD in partnership with OSU to develop the state funded applied research project for water supply and quality. The facility provides research information using a constructed bioretention facility, composed of 3 separate cells for testing and monitoring various stormwater treatment technology. Mr. Stebbins will provide varied coordination and implementation support totaling 0.12 FTE during the grant period. Adam holds an M.S. Environmental Science, B.A. Biology, B.A. Environmental science

Chris Bentley, Benton County Community Development Department, Senior Planner, has 30 years of experience as a land use planner and landscape architect for private development, city and county government in California, Colorado, Utah, and Oregon. Community engagement and education has been a primary focus in Benton County, where she has successfully collaborated with residents on Rural Unincorporated Community Plans for 5 communities, including Alpine, and is conversant with ongoing water challenges voiced by residents. She graduated in Landscape Architecture from Cal Poly, San Luis Obispo, with graduate study in Environmental Planning at Utah State University, Logan, Utah; and was an Instructor in site analysis and design at both institutions. Ms. Bentley will provide ~0.1 FTE for coordination and facilitation during the first year of the project

David Embleton has worked for three public drinking water systems in Oregon during the past 15 years. His experiences with these agencies have focused on water treatment, water quality, source protection, education and ASR operation. Since 2007, he has been the owner of a consulting business called GeoRain. He has assisted several clients in rainwater harvesting and exempt ASR well permitting. Mr. Embleton graduated from Linfield College with a Biology Degree with a minor in chemistry in 1997.

He is licensed in Oregon in water treatment for public and private water systems. He is also an accredited professional in rainwater catchment systems. Dave will be contracted to provide contracted services to support small scale ASR testing.

W. Todd Jarvis, PhD, is a consulting groundwater hydrologist with nearly 30 years of experience in deep well drilling in fractured rock and karst. Prior to joining Oregon State University (OSU) he worked for global water/wastewater engineering and groundwater engineering firms. He also worked as an expert witness and provided litigation support on groundwater rights and water well construction in the western US before becoming enlightened as a licensed and insured mediator in the US. He currently specializes in dispute prevention and conflict resolution related to groundwater resources and water well construction. He co-instructs weeklong intensive courses in Water Conflict Transformation and Wicked Problems through the Natural Resources Leadership Academy at OSU. He is an adjunct faculty member at the University of Oregon Law School teaching Environmental Conflict Resolution. He is a consultant to UNESCO in their Shared Waters training program. He provided weeklong “train the trainers” for African water professionals in 2010 and 2013 and “train the trainers” and advanced negotiations for Arab water professionals in 2011 and 2012. He is an Associate Editor of the journal Groundwater published through the National Ground Water Association. He serves on the Oregon State Board of Geologists Examiners through an appointment by Governor Kitzhaber. His book "Contesting Hidden Waters: Conflict Resolution for Groundwater and Aquifers" was released in 2014 by Earthscan. Dr. Jarvis holds the following degrees: BS, MS - Geology/Hydrogeology, University of Wyoming, Post Graduate Certificate - Conflict Resolution, University of Utah, PhD - Geography, Oregon State University. Dr. Jarvis will provide student engagement and facilitation services.

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.

If the project concept is deemed feasible and state funding is provided, the project co-leaders will begin swift implementation and utilization of funds. As noted in the Section VII. Feasibility budget, priority funding will be for paying the OSU student leading monitoring, analysis, and study data collection. This cost includes all OSU fees and overhead rolled into an hourly burden rate of \$67/hour. This rate allows for training the next generation of water professionals, and will result in further student engagement building that OWRD has supported in the past for groundwater studies (i.e. Jen Woody ASR graduate thesis project through OSU with Dr. Jarvis as supporting committee member). In addition the priority videography and manual development will be supported with USGS and Benton County funding, along with necessary study equipment purchase and installation. Benton County and OSU have a solid history with OWRD Feasibility Grants, securing a 2014 feasibility funding request to complete a similar applied feasibility testing facility for stormwater flow and quality. In addition, Benton County led the OWRD OWSCI funding during 2007 with a countywide water analysis and demand forecast and has partnered with OSU and OWRD water resources staff on 6 other projects that also included federal and local funding support.

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.
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.
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.

Above-Ground Storage

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

- | | | |
|--|------------------------------|-----------------------------|
| Will the project divert more than 500 acre-feet of surface water annually? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Will the project impound surface water on a perennial stream? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Will the project divert water from a stream that supports sensitive, threatened or endangered species? | <input type="checkbox"/> Yes | <input type="checkbox"/> 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.

A request was provided to Jon Unger (OWRD Grant specialist) to include proposed feasibility study:

From: UNGER Jon J [mailto:jonathan.j.unger@state.or.us]

Sent: Monday, February 01, 2016 11:37 AM

To: STEBBINS Adam

Subject: RE: Project on Underground Inventory

Please include this request in your application materials. Thank you.

Jon Unger | Grant Program Coordinator

Oregon Water Resources Department

Desk: 503.986.0869

From: STEBBINS Adam [mailto:Adam.Stebbins@CO.Benton.OR.US]

Sent: Monday, February 01, 2016 11:26 AM

To: UNGER Jon J

Subject: Project on Underground Inventory

Hi Jon,

Please include our proposed feasibility study of the Alpine community small scale ASR project, on the statewide water assessment and inventory.

Thanks.

Adam Stebbins

Natural Resources Coordinator

adam.stebbins@co.benton.or.us

(541) 766-6085 (office)

(541)740-1561 (cell)

360 SW Avery Ave.

Corvallis, OR 97333

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.
 - a.) *Local building requirements for catchment system on roofs, OWRD start card, DEQ admin approval of UIC*
 - b.) *Private property owner access agreements*

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:
<ul style="list-style-type: none"> • Cash - Cash is direct expenditures made in support of the feasibility study by the applicant or partner*. 	<ul style="list-style-type: none"> • Secured - Secured funding commitments from other sources.
<ul style="list-style-type: none"> • In-Kind - The value of in-kind labor, equipment rental and materials essential to the feasibility study provided by the applicant or partner. 	<ul style="list-style-type: none"> • 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)
County Staff (time for administration, outreach, coordination, GIS, environmental health, and management of project)	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$55,960	Throughout project
OSU Staff (time for professor and graduate students)	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input type="checkbox"/> secured <input checked="" type="checkbox"/> pending	\$1,852	Throughout project
OSU student videographer, Institute for Land & Water (time and equipment)	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$10,000	Throughout project
Four Worlds LLC Facilitation Services (outreach and education)	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$5,000	Throughout project
Supplies (Benton County-provided UV filter)	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$7,000	Project start
Landowner use of existing well infrastructure	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input type="checkbox"/> secured <input checked="" type="checkbox"/> pending	\$26,000	1 month after project start date
Benton County Board of Commissioners	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$45,067	When requested
Total match			\$150,880	

Pending Match documentation:

Pending match noted as the cost of wells construction as a surrogate for existing wells and estimated pump systems is also included to document the pending match of \$26,000 from the use of existing wells.

From: Evelyn Lee [mailto:evelee@peak.org]
Sent: Sunday, January 31, 2016 1:44 PM
To: BENTLEY Chris; 'Albert, Dennis'; 'Garrick Balsly'; gwiz@peak.org; 'Henry Gillow-Wiles'; 'Jim Vitus'; 'Julie Saylor'; 'Richard Saylor'
Cc: STEBBINS Adam
Subject: RE: ContactACC- Interviews for Graduate Student Study | Private Wellowners

Yes I would sign up for monitoring.

Evelyn Lee
Alpine Community Well owner
541-847-6028

From: BENTLEY Chris [mailto:Chris.BENTLEY@Co.Benton.OR.US]
Sent: Sunday, January 31, 2016 12:07 PM
To: 'Evelyn Lee' <evelee@peak.org>; Albert, Dennis <Dennis.Albert@oregonstate.edu>; Garrick Balsly <emeraldwash@aol.com>; gwiz@peak.org; Henry Gillow-Wiles <henry@mrlistersir.com>; Jim Vitus <rjvitus@pioneer.net>; Julie Saylor <juliesaylor@peak.org>; Richard Saylor <richardsaylor@peak.org>
Cc: STEBBINS Adam <Adam.Stebbins@CO.Benton.OR.US>
Subject: RE: ContactACC- Interviews for Graduate Student Study | Private Wellowners

What a coincidence. This email is to request a similar permission – in this case, permission to have OSU graduate student monitor low-flow domestic wells. As mentioned at the last CAC meeting, Benton County is applying for a feasibility grant focusing on seasonally inadequate wells in the Alpine area. This grant application is due February 1, tomorrow, and we just found out Friday that it would be helpful to our grant application if we could obtain approval from well owners to allow OSU grad students monitor wells periodically over the course of the next two years.

This pilot study would result in solutions for domestic wells that go dry during the highest-demand times of year. Monitoring would probably occur 2-4 times a year. If you are interested in allowing monitoring of your well(s) please let me know at your earliest convenience.

This is entirely separate from the request from Rianne BeCraft, sent out earlier, but it sounds as if her study would also provide some useful information. I'm happy to see that this issue is generating interest on many fronts.

Thank you!

Chris Bentley
Senior Planner | CWPP Coordinator
Benton County Community Development
360 SW Avery Avenue | Corvallis, Oregon 97333
541-766-6819 | Chris.bentley@co.benton.or.us

Current cost estimates of wells as justification for using existing well systems (domestic well with pump system and electricity costs) as match

A.H.n.
 Chr's Bently

MID VALLEY DRILLING, INC.

D. JOE LOVING
 P.O. BOX 547
 MONROE, OREGON 97456
 PHONE 847-5470

NAME Benton County Development Dept A.M. 12-10-2015
 P.M. 79
 ADDRESS 360 SW AVERY AVE Corvallis, OR 97333-1192
 WORK AT (Property location legal description) _____ PHONE 766-6879
 LEGAL OWNER _____ ADDRESS _____

DESCRIPTION OF WORK REQUESTED	CHARGE
1. Minimum set-up charge.	250 ⁰²
2. Drill well <u>6"</u> in diameter from surface to maximum depth of <u>300'</u> feet at cost of <u>1700</u> per foot.	5100 ⁰²
3. (Optional) Extend to depth of _____ feet if sufficient water supply not reached at first agreed depth. @ <u>Same</u> per foot.	
4. Material to be FURNISHED BY DRILLING CONTRACTOR at job site:	
a. Drive shoe <u>85⁰² IF Needed</u>	
b. Casing @ \$ <u>18⁰²</u> per lineal foot (Installed) <u>App 40'</u>	720 ⁰²
<input checked="" type="checkbox"/> Screen (Size & Type) _____ (Installed).	
d. Surface seal construction <u>25⁰² PM SK App 39'</u> (Installed).	975 ⁰²
e. Cement <u>16⁰² PM S. SK App 16 Socks</u>	256 ⁰²
f. Liner <u>4⁰² PM SK App 300'</u>	1275 ⁰²
g. Sanitary Well Seal <u>6x1 @ 25⁰²</u>	28 ⁰²
h. Start Fee to Water Resources Dept. <u>→ 225⁰²</u>	225 ⁰²
5. SERVICES <u>Exempt well use Fee 300⁰² → Not Incl. In Bid</u>	
a. Perforate casing _____ Hour(s) @ \$ _____ per hour.	
b. Holding time _____ Hour(s) @ \$ _____ per hour.	
c. Pump test _____ Hour(s) @ \$ _____ per hour.	
d. _____ // _____ Hour(s) @ \$ _____ per hour.	
e. _____ // _____ Hour(s) @ \$ _____ per hour.	
<u>Budget 1500⁰² to 2000⁰²</u> <u>For Pump - Pipe - Wire - Labor</u>	
ESTIMATED TOTAL <u>For 300'</u> <u>Cased Well</u>	8629 ⁰²

TERMS

- Oregon State Law requires well shall be 100' or more from septic tank or any open leach line or drain field. The customer realizing that the driller would have to dig up customers property to personally ascertain location of sewer installations, agrees to assume full responsibility for legal location of well.
- Customer hereby permits the Drilling Contractor to dump all drill cuttings, water and debris taken out of the hole during progress of the work, around and about the drill site at such place and in such manner as the Drilling Contractor may choose and the Drilling Contractor shall not be obligated to remove the same.
- The Drilling Contractor shall drill the hole with the diameter and casing sizes as specified above as long as, in the opinion of the Drilling Contractor, it remains practicable to do so considering the nature of the material being drilled. The Drilling Contractor does guarantee that the hole drilled shall be of sufficient diameter and plumb and straight enough to permit installation of pump.
- Payment shall be made on demand for all holes drilled and material used. The Drilling Contractor does not agree to find or develop water, nor does he represent, warrant or guarantee the quantity, quality or kind of water, if any, which may be encountered. Failure of the Drilling Contractor to strike water shall in no way release the Customer from payment of the full contract price.
- In case of suit or action to collect any sum due under this order, Customer shall pay attorney's fees and cost of suit together with interest on the sum due at the rate of one and one-half percent (1 1/2%) per month from the date of discontinuance of drilling.
- The customer will provide and maintain at their expense a clearly defined means of ingress and egress for all well drilling equipment.
- Drilling Contractor will test well for G.P.M. free of charge. For any additional test there will be an additional charge.
- Contractor retains the right to repossess material in well until payment is made in full.
- Full Payment upon completion unless otherwise specified.
- Customer Responsible for any underground utilities damaged unless otherwise specified.

(Signed) Donald J. Lovin Drilling Contractor 12-10-15 Date

VI. Feasibility Study Schedule

Estimated Study Duration: April 1, 2016 to January 31, 2017

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

Feasibility Study Key Tasks	2016			2016-2017				2018 & Beyond
	2 nd Qtr	3 rd Qtr	4 th Qtr	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	
<i>OWRD Grand Award/Acceptance; Finalize grant project implementation plan schedule, budget, and specific details</i>	X	X						
<i>Secure well drillers, storage and pump system installers, and student researchers</i>		X						
<i>Develop community process to engage Alpine area property owners, and determine specific properties for project implementation</i>		X						
<i>Complete drilling of 1 test well, 2 well retrofits; pump and monitoring equipment installation, and small scale ASR system installations</i>		X						
<i>Collect rainwater storage using above ground and below ground storage systems, and transfer of water to aquifer</i>				X	X	X		
<i>Complete storage and recovery of stored water from existing and newly drilled well systems</i>					X	X	X	
<i>Complete Year 1 monitoring and equipment maintenance for small scale ASR systems</i>		X	X	X	X	X	X	
<i>Complete quarterly community meetings to provide project updates and provide information for collective community ASR action</i>	X	X	X	X	X	X	X	
<i>Video documentation of entire process for education of all interested domestic well owners</i>	X	X	X	X	X	X	X	X
<i>Do It Yourself (DIY) documentation of all stages of feasibility study for informing domestic well owners statewide</i>	X	X	X	X	X	X	X	X
<i>Wrap up community meeting and project completion report</i>							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 – Benton County (includes admin costs w/in burden rate)	595 hours	Av.\$94.05	\$55,960			\$55,960
Staff Salary/Benefits – OSU Professor	96 hours	\$115			\$11,040	\$11,040
Staff Salary/Benefits – Student time (10 hours/week during school 25 hours during summer; includes required OSU admin costs, completion of all work including setup, monitoring, creation of landowner manual, and support with education video)	1200 hours	\$67			\$80,400	\$80,400
Staff – Students OSU required student fees	6 terms	\$5,640	\$1,852	\$15,068	\$16,920	\$33,840
Contractual/Consulting – Embleton	50 hours	\$100			\$5,000	\$5,000
Contractual/Consulting – Water analysis	37 samples	\$220			\$8,140	\$8,140
Contractual/Consulting – Well services	1 test well	\$4,000			\$4,000	\$4,000
Contractual/Consulting – Videography	1 video	\$10,000	\$10,000			\$10,000
Contractual/Consulting – Facilitation (Dr. W.Todd Jarvis)	5 days	\$1,000	\$5,000			\$5,000
Equipment per Embleton treatment system, well infrastructure on existing wells and test wells (educational)	3 packages	\$15,000		\$30,000	\$15,000	\$45,000
Supplies – UV Filter	1 filter	\$7,000	\$7,000			\$7,000
Supplies-Existing landowner domestic well updates for use of small scale ASR	2 existing wells	\$26,000	\$26,000			\$26,000
Other: Mileage	1500 miles	\$0.565			\$848	\$848
Administrative Costs**						
Total for Section A			\$105,812	\$45,068	\$141,348	\$292,228
Percentage for Section A			40%	10%	50%	100%

* Note: The “Unit” should be per “hour” or “day” – not per “project” or “contract.” $Units \times Unit\ Costs = Total\ Cost$

** 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
<i>OWRD Grand Award/Acceptance; Finalize grant project implementation plan schedule, budget, and specific details</i>	\$13,900			\$27,800
<i>Secure well drillers, storage and pump system installers, and student researchers</i>	\$8,509	\$2,511	\$13,285	\$48,610
<i>Develop community process to engage Alpine area property owners, and determine specific properties for project implementation</i>	\$9,450	\$2,511	\$2,760	\$29,442
<i>Complete drilling of 1 test well, 2 well retrofits; pump and monitoring equipment installation, and small scale ASR system installations</i>	\$15,140	\$2,511	\$8,807	\$71,772
<i>Collect rainwater storage using above ground and below ground storage systems, and transfer of water to aquifer</i>	\$11,984	\$32,513	\$43,673	\$175,562
<i>Complete storage and recovery of stored water from existing and newly drilled well systems</i>	\$8,509	\$2,511	\$13,285	\$48,610
<i>Complete Year 1 monitoring and equipment maintenance for small scale ASR systems</i>	\$11,984	\$2,511	\$43,033	\$115,056
<i>Complete quarterly community meetings to provide project updates and provide information for collective community ASR action</i>	\$8,509		\$16,045	\$49,108
<i>Video documentation of entire process for education of all interested domestic well owners</i>	\$10,000			\$20,000
<i>Do It Yourself (DIY) documentation of all stages of feasibility study for informing domestic well owners statewide</i>	\$7,827			\$15,654
Total for Section B	\$105,812	\$45,068	\$141,348	\$292,228

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. **This form does not need to be included in your application packet.**

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).

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.



COMMUNITY DEVELOPMENT DEPARTMENT

360 SW Avery Avenue
Corvallis, OR 97333-1192
(541) 766-6819
FAX (541) 766-6891

January 31, 2016

Dear Oregon Water Resources Department-Feasibility Grant Review Team,

The Benton County Community Development Department wholeheartedly supports funding the proposed feasibility study developed by our department and Oregon State University Institute for Water and Watersheds. We are confident that the project will support development of technical solutions to the Alpine community's longstanding water supply and quality issues. An added benefit is that this project also supports domestic well owners throughout the state of Oregon and beyond. We support the feasibility project's goals and objectives of informing domestic well owners, State of Oregon Water Resources Department and others interested in developing small scale groundwater storage and recovery, including:

- Train the next generation of water professionals through the OSU Water Resources Graduate Program;
- Determine viability of domestic well ASR concept beyond pilot areas in Lane County;
- Extend technology to other water scarce areas within Benton County, the Willamette Valley, and statewide;
- Develop an ASR user's manual for domestic well owners and others for review and use.
- Educate the general public by production of a video documenting local water history, project design, construction, and monitoring.

As the agency in Benton County responsible for connecting communities with needed resources and educating the public in methods of meeting the challenges of rural living, we look forward to the outcome and products of this important project. Towards this end planning department's staff is committed to spending at least 210 hours over the course of the study, at a rate of \$90/hour, in addition to the 45 hours already spent in the preparation of this application. We recognize that the latter represent our commitment to the project concept, and are costs that will not be recouped.

Respectfully,

Chris Bentley, Senior Planner

Benton County Community Development Department



COMMUNITY DEVELOPMENT DEPARTMENT

360 SW Avery Avenue
Corvallis, OR 97333-1192
(541) 766-6819
FAX (541) 766-6891

Dr. Todd Jarvis
OSU Institute for Water and Watersheds
234 Strand Agricultural Hall
Oregon State University
Corvallis OR 97331-2208

Dear Dr. Jarvis:

Benton County is in the process of finalizing our Feasibility Grant proposal to Oregon Department of Water Resources. As we discussed, \$1,852 in student tuition costs are categorized as “pending”, meaning that OSU still needs to secure funding for these costs. In the event that OSU is unable to fund the student at the pending cash match amount noted above, a reduction in student funds equal to the pending amount will occur.

Thank you for your collaboration efforts in this important project.

Sincerely,

Adam Stebbins, Project Coordinator



COMMUNITY DEVELOPMENT DEPARTMENT

360 SW Avery Avenue
Corvallis, OR 97333-1192
(541) 766-6819
FAX (541) 766-6891

Evelyn R. Lee
25776 Alpine Road
Monroe OR 97456

Dear Ms. Lee:

Benton County is in the process of finalizing our Feasibility Grant proposal to Oregon Department of Water Resources. As we discussed, Benton County staff has estimated the in-kind match value of the well and pump system proposed for study purposes on your property at \$13,000. This estimate was based on current well drilling and pump installation costs. Benton County Community Development has used this estimate as "pending" in-kind match for the grant proposal. In the event the grant is awarded, your well and pump system will be utilized to realize this in-kind match value.

Thank you for your cooperation in this important project.

Sincerely,

Adam Stebbins, Project Coordinator



COMMUNITY DEVELOPMENT DEPARTMENT

360 SW Avery Avenue
Corvallis, OR 97333-1192
(541) 766-6819
FAX (541) 766-6891

Richard Saylor
25139 Larson Road
Monroe OR 97456

Dear Mr. Saylor:

Benton County is in the process of finalizing our Feasibility Grant proposal to Oregon Department of Water Resources. As we discussed, Benton County staff has estimated the in-kind match value of the well and pump system proposed for study purposes on your property at \$13,000. This estimate was based on current well drilling and pump installation costs. Benton County Community Development has used this estimate as “pending” in-kind match for the grant proposal. In the event the grant is awarded, your well and pump system will be utilized to realize this in-kind match value. Thank you for your cooperation in this important project.

Sincerely,

Adam Stebbins, Project Coordinator



January 25, 2016

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Dear Oregon Water Resources Department-Feasibility Grant Review Team,

Oregon BEST supports funding of the proposed feasibility study developed by the Benton County Community Development and Oregon State University Institute for Water and Watersheds. The project will support development of technical solutions to 100 years of water supply and quality issues within the rural Alpine community, and supports domestic well owners throughout the state of Oregon and beyond.

Oregon BEST is an independent non-profit technology-based economic development organization, focused on funding and supporting cleantech startups in Oregon. We support innovators from the universities and the private sector throughout our state that are working on developing novel technologies that are good for the planet. We have a network of nine research labs that are available for industry and academic use, including the OSU-Benton County Green Stormwater Infrastructure Research (OGSIR) Facility.

Oregon BEST is interested in supporting the development of technologies that leverage the intellectual assets of Oregon to solve problems in Oregon and beyond, while creating economic opportunity here at home. We therefore support the goals of the proposed feasibility study to inform domestic well owners, State of Oregon Water Resources Department and others interested in developing small scale groundwater storage and recovery, including:

- Train the next generation of water professionals through the OSU Water Resources Graduate Program;
- Determine viability of domestic well ASR concept beyond pilot areas in Lane County;
- Extend technology to other water scarce areas within Benton County, the Willamette Valley, and statewide;
- Develop an ASR user's manual for domestic well owners and others for review and use;
- Produce a video documenting local water history, project design, construction, and monitoring.

We are excited to work with the proposed project team on helping to ensure Oregon captures the commercialization opportunities for the proposed aquifer storage technology.

Sincerely,

A handwritten signature in black ink, appearing to read "David Kenney", written over a light blue horizontal line.

David Kenney, *President & Executive Director*



EGR & Associates, Inc.

Engineers, Geologists and Surveyors

2535B Prairie Road
Eugene, Oregon 97402
(541) 688-8322
Fax (541) 688-8087

January 28, 2016

Dear Oregon Water Resources Department-Feasibility Grant Review Team,

EGR & Associates, Inc. (EGR) supports funding of the proposed feasibility study developed by the Benton County Community Development and Oregon State University Institute for Water and Watersheds. The project will support development of technical solutions to 100 years of water supply and quality issues within the rural Alpine community, and supports domestic well owners throughout the state of Oregon and beyond. We support the feasibility findings goals to inform domestic well owners, State of Oregon Water Resources Department and others interested in developing small scale groundwater storage and recovery, including:

- Train the next generation of water professionals through the OSU Water Resources Graduate Program;
- Determine viability of domestic well ASR concept beyond pilot areas in Lane County;
- Extend technology to other water scarce areas within Benton County, the Willamette Valley, and statewide;
- Develop an ASR user's manual for domestic well owners and others for review and use.
- Produce a video documenting local water history, project design, construction, and monitoring.

EGR assists private land owners is demonstrating sufficient water is available for residential development. In areas of low yielding aquifers, ASR in exempt wells may provide an opportunity for residential development in areas with otherwise marginal water supplies.

Sincerely,

Steven I. Recca, R.G., C.W.R.E.

EGR & Associates, Inc.
2535B Prairie Road
Eugene Oregon, 97402

Phone: 541-688-8322
Fax: 541-688-8087



MARYS RIVER WATERSHED COUNCIL

"Inspiring and supporting voluntary stewardship
of the Marys River watershed."

January 29, 2016

Dear Oregon Water Resources Department-Feasibility Grant Review Team,

Marys River Watershed Council supports funding of the proposed feasibility study developed by the Benton County Community Development and Oregon State University Institute for Water and Watersheds.

The project will support development of technical solutions to 100 years of water supply and quality issues within the rural Alpine community, and supports domestic well owners throughout the state of Oregon and beyond. We support the feasibility findings goals to inform domestic well owners, State of Oregon Water Resources Department and others interested in developing small scale groundwater storage and recovery, including:

- Train the next generation of water professionals through the OSU Water Resources Graduate Program;
- Determine viability of domestic well ASR concept beyond pilot areas in Lane County;
- Extend technology to other water scarce areas within Benton County, the Willamette Valley, and statewide;
- Develop an ASR user's manual for domestic well owners and others for review and use.
- Produce a video documenting local water history, project design, construction, and monitoring.

MRWC's history, as well as current actions and forward-looking interests all lie within the use and protection of water as a resource for people, flora and fauna. Our civic use of water today and in the coming few years could easily have a dramatic impact on everyone many years from now. We fully support this study as a first step to better understand, and thus plan for, future uses of water that give rise to clean and abundant water for future generations.

Sincerely,

Deb Merchant
Executive Director
deb@mrwc.org



Institute for Water & Watersheds
Oregon State University, 234 Strand Agriculture Hall, Corvallis, Oregon 97331-2212
T 541-737-4032 | F 541-737-1887 | <http://water.oregonstate.edu>, todd.jarvis@oregonstate.edu

January 28, 2016

Dear Oregon Water Resources Department-Feasibility Grant Review Team,

The Institute for Water & Watersheds at Oregon State University supports funding of the proposed feasibility study developed by the Benton County Community Development. The project will support development of technical solutions to 100 years of water supply and quality issues within the rural Alpine community, and supports domestic well owners throughout the state of Oregon and beyond. We support the feasibility findings goals to inform domestic well owners, State of Oregon Water Resources Department and others interested in developing small scale groundwater storage and recovery, including:

- Train the next generation of water professionals through the OSU Water Resources Graduate Program;
- Determine viability of domestic well ASR concept beyond pilot areas in Lane County;
- Extend technology to other water scarce areas within Benton County, the Willamette Valley, and statewide; and
- Develop an ASR user's manual for domestic well owners and others for review and use.

The Institute for Water & Watersheds proposes to produce a video documenting the local water history, project design, construction, and monitoring as part of this study. On the basis of past video projects completed by IWW videographers, the worth of these services to the study will approach \$10,000.

As one of the principals for the collaborative partnership of Four Worlds, LLC, I will provide professional facilitation services for the study valued at \$5,000.

Respectfully Submitted,

Todd Jarvis, PhD
Interim Director
Oregon Certified Engineering Geologist,
Certified Water Right Examiner,
Certified Mediator



Benton County Health Department
Environmental Health

4077 SW Research Way
P.O. Box 3020
Corvallis, OR 97339-3020

Main Line: 541-766-6841 • FAX: 541-766-6248

Health Department: 530 NW 27th Street, Corvallis OR 97333 • 541-766-6835

Developmental Disabilities: 541-766-6847

Telecommunications Relay Service: TTY 1-800-735-2900 • Website: www.co.benton.or.us/health

Person-Centered Behavioral & Physical Health Care Public Health & Prevention Regulatory and Population Health **Health Management Services**

January 12, 2016

Dear Oregon Water Resources Department-Feasibility Grant Review Team,

Benton County Environmental Health supports funding of the proposed feasibility study developed by the Benton County Community Development and Oregon State University Institute for Water and Watersheds.

The project will support development of technical solutions to 100 years of water supply and quality issues within the rural Alpine community, and supports domestic well owners throughout the state of Oregon and beyond.

We support the feasibility findings goals to inform domestic well owners, State of Oregon Water Resources Department and others interested in developing small scale groundwater storage and recovery, including:

- Train the next generation of water professionals through the OSU Water Resources Graduate Program;
- Determine viability of domestic well ASR concept beyond pilot areas in Lane County;
- Extend technology to other water scarce areas within Benton County, the Willamette Valley, and statewide;
- Develop an ASR user's manual for domestic well owners and others for review and use.
- Produce a video documenting local water history, project design, construction, and monitoring.

We regulate public water systems in Benton County to assure that they meet health based standards or best management practices. Our interest in the project is to assure that design criteria will consider both short-term and long-term health effects to include but not be limited to pathogen reduction and leaching of toxic chemicals from construction materials used in designing and operating these systems. We will provide staff time as noted in the budget up to \$2,000 or 20 hours.

Sincerely,
William B. Emminger, REHS
Division Director
Benton County Environmental Health

"ENGAGED COMMUNITIES AND BLENDED SERVICES ACHIEVING BETTER HEALTH"