



2015-2017 Grant Solicitation

WATER CONSERVATION, REUSE AND STORAGE FEASIBILITY STUDY GRANT PROGRAM

GRANT APPLICATION

APPLICATION INSTRUCTIONS

1. Complete Sections I through VII in the spaces provided.
2. An application must be submitted on a form provided by the Department. An explanation must accompany the application if any of the information required cannot be provided [OAR 690-600-0020(6)].
3. If in hard copy - use 8 ½" x 11" single sided, unstapled pages. Provide any attachments to application also on 8 ½" x 11" single-sided, unstapled pages. Avoid color and detail that will not photocopy clearly.
4. Please Contact the Department's Grant Specialist Jon Unger at **503.986.0869** or Jon.J.Unger@wrд.state.or.us if you have any questions.

Application Deadline: July 31, 2015 5:00 PM,
(Application must be received by this date and time)

Mail application to:

OREGON WATER RESOURCES DEPARTMENT
Attention: Grant Specialist
725 Summer Street NE, Suite A
Salem, OR 97301

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KEY GRANT INFORMATION

Introduction. The Water Conservation, Reuse and Storage Grant Program, established by Senate Bill 1069 (2008), is designed to fund the qualifying costs of feasibility studies that evaluate the feasibility of developing water conservation, reuse or storage projects. Oregon is facing increasing water demand and increasingly scarce water supplies. To adequately meet Oregon's diverse water demands now and into the future, Oregonians must use their water wisely and efficiently. That means looking more closely at innovative water conservation and reuse programs and environmentally sound storage projects that capture available water so it can be put to good use when needed.

What is a feasibility study? A feasibility study is an assessment of a proposed plan or method. Typically there should be a previously identified water project that appears to have merit but is lacking important details necessary to determine whether or not to proceed. The feasibility study focuses on helping answer the essential question of "should we proceed with the proposed project idea?" All activities of the study are directed toward helping answer this question. Ideally the project identified will have community support and will have been identified through a collaborative process.

Match Funding. To be eligible for funding applicants must clearly demonstrate funding from a source other than the Program of not less than a dollar-for-dollar match from cash or in-kind services. For example, if \$25,000 is requested in Program Funds, then there must be a match of at least \$25,000 from another source. The matching funds must be secured or in the process of being secured. The maximum grant award is \$500,000.

Eligibility Requirements for Storage Studies. To be eligible for funding for a project feasibility study associated with a proposed storage project that would: Impound surface water on a perennial stream; Divert water from a stream that supports sensitive, threatened or endangered fish; or Divert more than 500 acre-feet of surface water annually, the proposed project feasibility study must contain the following elements:

- 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;
- 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;
- Analyses of environmental harm or impacts from the proposed storage project;
- Evaluation of the need for and feasibility of using stored water to augment in-stream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values; and
- 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.

See Application Criteria and Evaluation Guidance for assistance in filling out this application.

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WATER CONSERVATION, REUSE AND STORAGE
FEASIBILITY STUDY GRANT PROGRAM

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I. Grant Information

Study Name: Mosier Valley Commingling Well Evaluations

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

Program Funding Dollars Requested: \$ \$132,900 Total Cost of Feasibility Study: \$ \$412,900
Note: Request may not exceed \$500,000

II. Applicant Information

Table with 2 columns: Applicant Name: Wasco County Soil and Water Conservation District, Co-Applicant Name: Mosier Watershed Council. Rows include Address, Phone, Fax, and Email for both parties.

Table with 1 column: Principle Contact: Shilah Olson. Rows include Address, Phone, Fax, and 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: [Signature] Date: 7/30/15
Print Name: Shilah K. Olson Title: District Manager

III. Feasibility Study Summary

Please give a brief summary of the feasibility study using no more than 150 words. Results of two jointly funded USGS and OWRD studies, show the principal cause of 40 years of declining aquifers in Mosier to be commingling wells which allow flow between aquifers through existing boreholes. This study refines that predicted hydrological analysis by gathering site-specific data to determine the extent of commingling within the zone predicted to have the highest impact on aquifer declines. These data will then be evaluated to determine the cost of repairing priority wells and whether any other mechanisms are significant, to maximize the amount of conserved water. Evaluation will consist of reviewing well logs to determine the likelihood of commingling followed by field evaluation of wells to confirm commingling. This will produce a prioritized well remediation list to stop the declines and begin to restore the aquifer. making efficient use of the \$1 million recently established for that purpose by the Oregon legislature.

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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.

Our goal is to protect the Mosier Valley Community and maximize conserved water within the underlying aquifer by meeting the long-term water needs of the residents and agricultural economy in a sustainable way that will stabilize or reverse the current groundwater decline and the resulting Mosier Creek base flow declines. The community is groundwater dependent and despite significant irrigation system conservation measures, some are already experiencing difficulty drawing water. The commingling issue was first generally identified in two previous related studies, the jointly funded USGS Evaluation of Long-Term Water-Level Declines in Basalt Aquifers near Mosier, Oregon published by USGS as Scientific Investigations Report 2012-5002, and the Mosier Aquifer Recovery Feasibility Study 2011 by GSI Water Solutions, Inc. funded by OWRD Grant #GB001609. The USGS study developed a hydrogeologic model of the Mosier aquifers and enabled evaluation of the feasibility of pursuing below-ground storage: aquifer recharge, (AR) or aquifer storage and recovery (ASR), or above-ground storage and conservation alternatives to meet Mosier's water needs. Those previous studies concluded that commingling wells are a significant and likely dominant cause of groundwater declines in the Mosier area. However, the specific wells losing the most water were unknown and therefore must be identified and repaired before any alternative to restore the aquifers can have a reasonable chance of success. Commingling is the uncontrolled flow of water between aquifers, resulting in depressurization and loss of recoverable water which also may affect discharges to streams. Commingling well remediation ranked the highest of all alternatives in the Mosier Aquifer Recovery Feasibility Study.

This proposed Conservation Project feasibility study is the next logical step following those previous studies. This proposed study will refine the hydrological analysis [SB1069 Section 2(1)(c)] predicted in the OWRD and USGS studies by evaluating existing wells for the extent of commingling within the zones where this process is predicted to be the most significant. The field evaluations will provide site-specific data for prioritizing wells to provide the biggest "bang for the buck" for repair. Furthermore, these data will enable financial analysis to determine the total cost of repairing priority wells [SB1069 Section 2(1)(k)], as well as identify any other mechanisms that may be contributing to the decline, to maximize the amount of conserved water within the aquifer. Implementation of systematic repairs then will follow.

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."

Groundwater currently supplies all of the domestic water needs of residents of the small City of Mosier and the surrounding rural residential areas in the Mosier valley. It also supplies the majority of the irrigation water needs in the Mosier valley, although it is supplemented by a small amount of surface water diverted from Mosier Creek and the Columbia River.

The estimated present groundwater demand can be broken down into the following uses:

<i>City (average 1989 – 2005)</i>	<i>97 afy (acre-feet per year)</i>
<i>Rural residential (2005)</i>	<i>105 afy</i>
<i>Irrigation (2007)</i>	<i>850 – 1,500 afy</i>
<i>Total</i>	<i>1,052 – 1,702 afy</i>

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In 1985 a hydrologic assessment by the OWRD in 1985 showed about 600 acres (predominantly orchards) dependent on groundwater for irrigation. At that time, depending on the methods used, withdrawal volumes ranged from 600 – 1,500 afy. In 2004, the OWRD listed 900 irrigated acres dependent on groundwater. Extrapolation of the 1985 figures provides a 2004 estimate for withdrawals of 900 – 2,250 afy. This is likely to be an over-estimate as Wasco County SWCD has been working with orchardists in the Mosier area for the past several years to

upgrade irrigation systems to increase water use efficiency. Conversion from impact sprinkler systems to micro and drip systems has enabled some orchardists to significantly reduce their water application from 3 feet to as little as 1 foot of water. As a result the 2007 irrigation estimate (850-1,500 afy) now resembles the 1985 usage based on (1) an assumed reduction caused by efficiency upgrades and (2) on measured reduction seen in data from flow meters installed on a subset of Mosier wells during the 2006 and 2007 irrigation seasons.

The city reported much lower usage in 2007 (53 afy) following repairs to the distribution system and installation of meters at homes. In 2008, usage was nearly back up to the 1989 – 2005 levels(97 afy). This “rebound” effect is common within a year or so after meters are installed. Since that time, consumption has again decreased. Recent city useage figures between 2012-2014 ranged from 77-88 afy.

Future demand estimates, below, assume full rural residential build out, full City of Mosier build out, and static irrigation demand at the higher end of current estimates (to leave room for potential expansion of irrigated acreage, but also considering the potential for further efficiency improvements).

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Estimated future demand:

City	194 afy (still far less than the city water right of 483 afy)
Rural residential	210 afy
Irrigation	1,500 afy
Total	1,904 afy

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(Water demand data from the Mosier Groundwater Sustainability Study.
(http://or.water.usgs.gov/projs_dir/mosier/background.html)

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).

This project is a groundwater conservation project aimed at stopping groundwater losses affecting the community and the environment. The situation is analogous to a bucket with holes in it. Plug the holes and you can stop the water loss. At current useage rates estimated at approximately 1,500 afy, aquifer declines are continuing. As projected future demand of an additional 400 afy without commingling well remediation, aquifer declines are likely to accelerate and become even less sustainable. This project will evaluate and identify wells that are commingling and prioritize them for repair or decommissioning and replacement as appropriate. Based on model simulations conducted as part of the USGS Scientific Investigation on the declines in basalt aquifers in Mosier (USGS SIR 2012-5002 page 53, Table 3) repairing all commingling wells in the Mosier area could provide an 85% recovery of aquifer levels. Similarly, the report shows that by repairing wells in the highest priority zones, 11-23% recovery is possible. Our efforts would target the as yet unidentified, highest priority wells within these zones and at a minimum arrest the present declines, making the groundwater resource sustainable and likely enabling the resource to meet projected future demands. The predicted recovery from repairing the highest priority wells is projected to achieve the sustainability needed to meet 100% of the water supply need in Mosier.

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

The Mosier area is underlain by flood basalts of the Columbia River Basalt Group (CRBG), and is the primary water supply for rural domestic, irrigation and municipal uses in the Mosier Creek watershed. OWRD initiated a study of the Mosier area aquifers in 1985 that subsequently documented water level decline rates of 3.3 feet per year (ft/yr) in the Priest Rapids aquifers and 6.9 ft/yr in the Pomona aquifer. De-pressurization through commingling wells was identified in the study as a potentially significant cause of water level declines in the Priest Rapids aquifers. In response to the water level declines, OWRD delineated an administrative area in 1988 and withdrew the Pomona and Priest Rapids aquifers from further appropriation other than for exempt uses. Despite the withdrawal of the aquifers, water level declines continued to occur at similar rates, with total declines of 150 to 200 feet recorded in some wells.

Wells in the Pomona, Priest Rapids, and Frenchman Springs basalt aquifers in the Pomona-Priest Rapids Groundwater Withdrawal Area southeast of the Rocky Prairie Thrust Fault near the Mosier Syncline axis are estimated to have the highest potential impact on groundwater losses from commingling. Higher hydrostatic

pressure differentials between the aquifers equate to higher flow rates where commingling is present. Those pressures are highest near the syncline axis and diminish upslope, away from the syncline to the southeast. The Rocky Prairie Thrust Fault forms the northwest boundary of the area of interest.

Our approach to evaluating wells in this area is first to closely examine well logs to determine if there is a hydraulic connection between Pomona and Priest Rapids or Priest Rapids and Frenchman Springs aquifers at each well. If there is a connection then the well will be identified as potentially commingling and a field evaluation will be done. The field evaluation will consist of pulling the pump, logging the well using a borehole camera and flagging it to determine if commingling is occurring and estimating the borehole flow rate. If commingling is found to be present then the well will be listed and prioritized for remediation. Remediation will consist of either repair or decommissioning and replacement where repair is not considered feasible. A basic design will be produced for the remediation and cost estimates developed. Under this conservation project feasibility study a determination will be made for each commingling well as to whether the recommended remediation is feasible or not.

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. The well evaluation study will begin with desk top evaluation of well logs to determine if there is a possibility of commingling aquifers between Pomona and Priest Rapids or Priest Rapids and Frenchman Springs aquifers based on well construction and geologic stratigraphy. If commingling is likely to be present, then a field evaluation will be completed to determine if active commingling is occurring at the well and an estimate of commingling flow can be made. For the field evaluation a well driller will pull the pump and the well will be logged with a borehole camera to make the commingling determination and estimate the flow rate. Following field evaluation, the pump will be reinstalled and the well restored to operational condition. If commingling is occurring the well will be prioritized for repair or replacement based on the estimated quantity of commingling flow. Field evaluations of irrigation wells will be done between October and March so that they will not interfere with usage during the irrigation season. Field evaluation of domestic wells can be done throughout the year except during severe cold weather, and a temporary water source will be provided while the well is being evaluated.

b. The well evaluation study will begin in August 2015 under District funding.

c. Tasks to be completed:

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- i. Desktop Evaluation of Well Logs
- ii. August 2015 through December 2016
- iii. Obtain well logs. Review stratigraphic data to determine which aquifers were penetrated during well drilling. If drilling did not penetrate into the Priest Rapids or Frenchman Springs aquifer or it was cased and sealed to the deepest aquifer it is likely not commingling and no further action is required. If it does penetrate into the Priest Rapids or Frenchman Springs aquifer and is not cased and sealed to the deepest aquifer, it will be added to the list of wells that need to be scheduled for field evaluation.
- iv. Resources needed: Will contract with GSI for hydrogeologic support.
- i. Field Evaluation of Wells suspected of Commingling.
- ii. October 2015 through March 2016 and October 2016 through March 2017 (for irrigation wells) September 2015 through June 2017 (for domestic wells) except for severe cold periods which may freeze temporary water supplies to be provided during field evaluation of wells.
- iii. Coordinate scheduling of field evaluations with well owner, pump contractor, well video contractor. When scheduled, the well pump contractor will disconnect and pull the pump system for the well. If the well is a domestic water source, a temporary water supply will be connected to provide water to the residence. The well video contractor will obtain borehole video and possibly a borehole flow profile or temperature profile which will be used to determine if commingling is occurring. Following logging of the well, the pump will be reinstalled and the well restored to pre-evaluation operating conditions. If commingling is occurring, the well will be prioritized and added to the remediation list for follow-up repair/replacement.
- iv. Resources needed: GSI will be contracted for desktop well assessments, coordination and management of field assessments, contracting the pump and well video contractors, interpreting data collected during field assessments, recommendation for well repair and/or replacement options, and documentation of project activities.

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.

The project area is located in the eastern Hood Basin, Wasco County, southeast of the City of Mosier including T2N, R11E, Sections 12, 13, and 24 and T2N, R12E Sections 5, 6, 7, 8, 17, 18, and 19

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

Not applicable. The source water is within ground water aquifers.

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

Not applicable. This is a groundwater conservation project.

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

Not applicable. This is a groundwater conservation project

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

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Conserved water in groundwater aquifers is used for municipal water and domestic water supply, irrigation, livestock watering, and maintenance of in-stream flow.

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

JUL 31 2015

Not applicable for groundwater aquifers..

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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.

No permits or governmental approvals are required for this project which involves only evaluation of existing wells.

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.

This project is a high priority for Mosier Watershed Council, City of Mosier, Mosier area residents, and the Mosier valley agricultural community. Without sustainable groundwater resources the community of Mosier is at severe economic risk.

The Mosier Watershed Council initiated the USGS Mosier Groundwater Sustainability Study in 2005, and it served as a forum for public presentation and discussion of that study's progress and on-going groundwater work. It will continue to serve in that capacity. This well evaluation effort will take the next step toward the Council's goal of: "Stable or recovering aquifers in the Mosier Valley providing for municipal and domestic drinking water and commercial irrigation." The Mosier Watershed Council currently is conducting outreach to all well owners to gain their participation in the well evaluations

The Wasco County Soil & Water Conservation District (SWCD) provides grant project management and fiscal administration, as well as council coordination and other technical support to the Mosier Watershed Council, and it will continue this support throughout the proposed study. The SWCD is committed to helping solve the groundwater resource issue. To date, it jointly funded with USGS the Scientific Investigation on the Declines in Basalt Aquifers in Mosier, and since completion of the AS/AR Feasibility study, has invested annually in well evaluations to identify commingling wells and one commingling well decommissioning and replacement. The SWCD also has, in partnership with USDA Natural Resources Conservation Service, helped design and implement many irrigation system efficiency upgrades in the Mosier valley. The SWCD has conducted multiple water conservation workshops in Mosier. The proposed study will allow the SWCD accelerate work toward the achievement of groundwater conservation in Mosier.

OWRD groundwater (GW) staff has been active in the Mosier area for more than 30 years addressing hydrologic and administrative issues. In addition to the groundwater study in the mid 1980s and the subsequent groundwater withdrawal proceedings, OWRD GW staff has an ongoing working relationship with water users and well constructors in the area to maximize the use of the remaining resource while attempting to minimize additional problems. Department hydrogeologists helped establish the current groundwater data collection program in the Mosier area, and they periodically analyze the data and report the results. OWRD GW staff also has worked with county staff and watershed groups through technical assistance, project oversight assistance, and public education support.

Growers in Mosier, represented by associations including the Mosier Fruit Growers and the Columbia Cherry Company, have been thoroughly involved with the ongoing Mosier Groundwater sustainability work. They are core participants in the Mosier Watershed Council.. They volunteered a dozen orchard irrigation wells for flow metering, above and beyond wells already monitored by the OWRD, in order to track conservation gains due to irrigation efficiency upgrades. Most orchard managers in Mosier have upgraded inefficient impact sprinklers to micro sprinklers or to even more efficient drip irrigation systems, and they have learned to irrigate only as needed based on soil moisture monitoring. Mosier farmers are committed to sustainably managing the area's groundwater resources,

upon which their livelihoods depend. The proposed study will benefit them by directly advancing the cause of sustainable groundwater management.

State Senator Ted Ferrioli and State Representative John Huffman both have been long term supporters of our groundwater efforts in Mosier. Representative Huffman had a lead role in the recent legislative session getting funding allocated for well repairs in Mosier that should be available late this biennium.

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

Matching funds are secured from Wasco County Soil and Water Conservation District in its current budget for the fiscal year July 1, 2015 through June 30, 2016 and pending from the District in the following fiscal year budget expected to be adopted in June 2016 and cover the period July 1, 2016 through June 30, 2017.

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.

Ron Graves, Wasco County Soil & Water Conservation District Project Manager, will serve as Project Manager. Ron served as Wasco County SWCD District Manager from 1990-2015, with responsibility for all aspects of district operations, administration, and project management. He has 25 years experience in planning and implementing full-scale, holistic watershed health improvement projects. During his time as manager, he led the district to complete more than 240 projects, in partnership with other organizations, using a variety of local, state, federal, and private funding sources.

Wasco County SWCD, District Manager Shilah Olson will work closely with the project manager and has 10 years experience with the District in increasing levels of responsibility. She also serves as District Budget Officer and Contracting Officer. Watershed Council Coordinator Abigail Simmons, 2 years experience with Mosier Watershed Council: will assist with Council meeting organization and coordination, particularly for project progress updates.

OWRD, Hydrogeologist Ken Lite: experience with water rights and regulations, expert understanding of Mosier hydrology. Ken Lite has worked as a hydrogeologist with OWRD for more than 30 years. He was the chief investigator and lead author of OWRD's Mosier Groundwater Study. He has worked as a technical advisor to Wasco County on the Mosier area Transition Lands Study and to the Mosier Watershed Council. He is co-author of the 2004 USGS publication titled "Simulation of Regional Ground-Water Flow in the Upper Deschutes Basin."

Mosier Watershed Council co-Chairs Bryce Molesworth and Kristen McNall have both been involved in the Mosier Groundwater effort for over a decade, and have led the council in holding public forums on the progress of the effort. They have kept the local stakeholders involved and informed and have briefed our legislative representatives. Additionally they were active in proposing language for well standards to help prevent new wells in the Mosier area from contributing to the problem. Bryce, as a local orchardist, has also implemented intensive irrigation water management systems to maximise water use efficiency.

GSI Water Solutions Inc. consulted with Wasco County Soil and Water Conservation District and Mosier Watershed Council for the Mosier Aquifer Feasibility Study completed in 2011. GSI has consulted with the District and Watershed Council on well evaluations, completing 40 desk top (well log) evaluations and 10 field evaluations of wells. During the past fiscal year one high priority commingling well was decommissioned and replaced under GSI supervision. A new contract with GSI has been prepared for more well evaluations during the July 2015 through June 2016 fiscal year and will likely be extended an additional year to complete evaluations on all wells in the priority area. Two Key GSI Personnel are:
1. Jason Melady has 13 years of experience in planning and executing hydrogeologic investigations in Columbia River Basalt aquifers in Oregon. Jason has been the technical lead in recent assessments completed by the Wasco County Soil and Water Conservation District and Mosier Watershed Council to evaluate the presence and severity of commingling and the feasibility of repairing wells in the Mosier area. He brings to the team specific knowledge of the SWCD's commingling issues and area hydrogeology. Jason is also an Oregon certified water right examiner and has extensive experience assisting clients with the OWRD permitting processes. Jason is a registered geologist (G1996) and certified water rights examiner in Oregon (79557).

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2. Walter Burt has 26 years of experience in planning and managing hydrogeological investigations in the Pacific Northwest. Walt has worked extensively on groundwater resource investigations and water supply development in Columbia River Basalt Group aquifers, including in the vicinity of the project area. He has been working with the Wasco County Soil and Water Conservation District and Mosier Watershed Council over the past four years to assess and prioritize the repair of commingling wells. Walt is registered geologist in Oregon (G1402)

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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.

Contacted John Unger 3/10/2015, 6/9/2015, 6/10/2015, 7/24/2015. Inventory request form attached.

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.

The associated project to follow this well evaluation work will implement well repairs on those found to be commingling, thereby stopping the declines in Mosier aquifers so that their use is sustainable, obviating the need to develop new water supplies. Ref: Mosier Watershed Council, Mosier Aquifer Recovery Feasibility Study; OWRD Grant #GB001609; 6/20/2011.

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.

Implementation of the project associated with this well evaluation effort requires no permitting. OWRD water well repair standards are defined by rule in OAR 690-215. Any well repair which does not meet that standard would require a special standard as defined in OAR 690-2000-0021 and be subject to approval by OWRD well construction staff. Well repairs are expected to all be in private ownership. Cost share agreements will be developed for each well to be repaired.

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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.

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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.

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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)
<i>Wasco County Soil and Water Conservation District</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$130,000	July 15
<i>Wasco County Soil and Water Conservation District</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input checked="" type="checkbox"/> pending	\$130,000	July 16
<i>Mosier Watershed Council</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input type="checkbox"/> secured <input checked="" type="checkbox"/> pending	\$10,000	August 15
<i>Wasco County Soil and Water Conservation District</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$10,000	July 15
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		

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FIGURE X

Study Area Map Mosier Commingling Well Repair Assessment

LEGEND

- Approximate Study Area
- Pomona/Priest Rapids
- OWRD Administrative Area
- USGS Zone 1 Area
- Cities
- Highways
- Roads
- Watercourse
- Waterbody

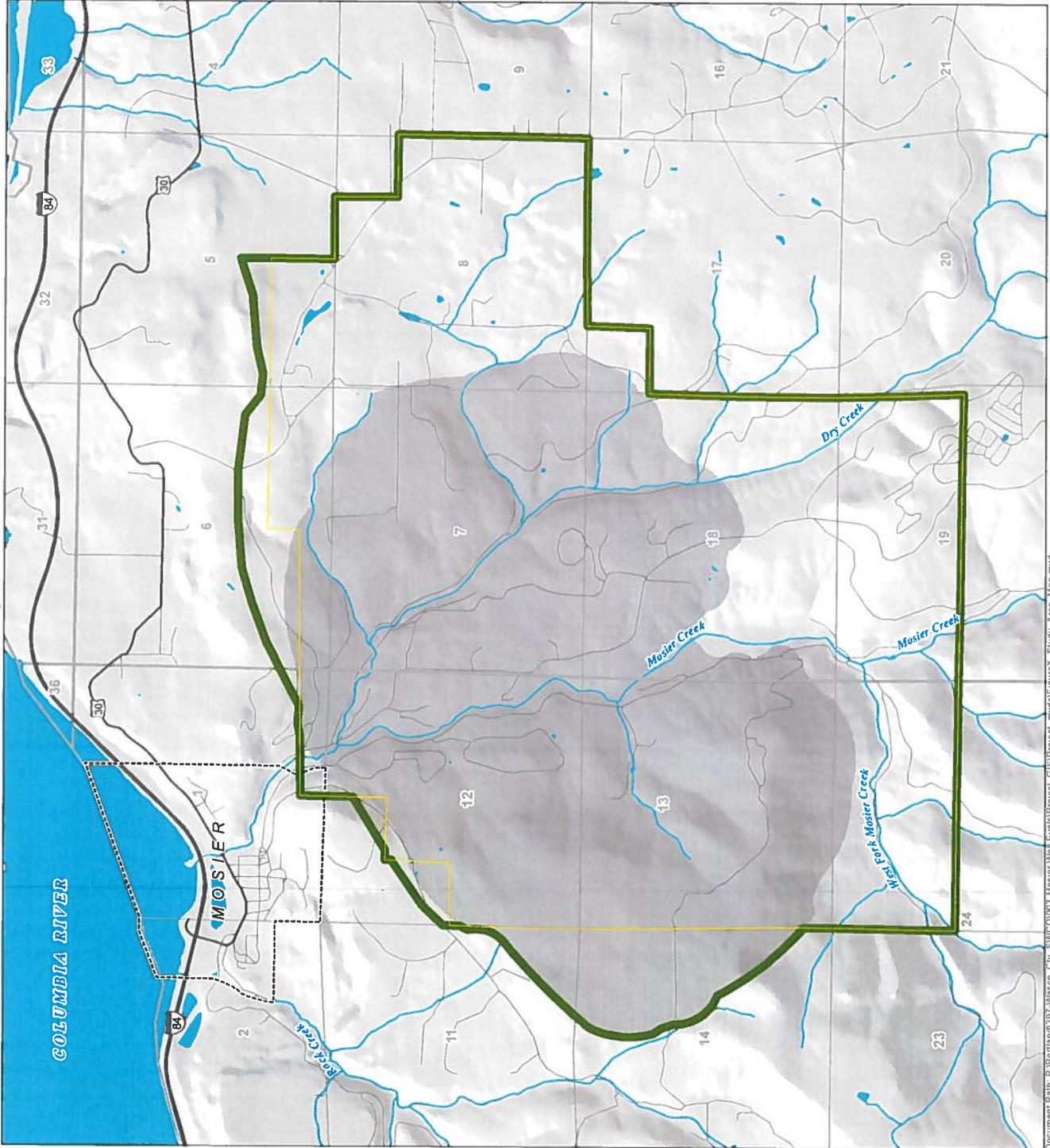
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MAP NOTES:
Date: July 24, 2015
Data Source: USGS, EBR





Wasco County Soil & Water Conservation District

2325 River Road, Suite 3
The Dalles, OR 97058-3551

Tel: (541)296-6178 ext. 3, Fax: (541)296-7868, E-mail: wasco.swcd@oacd.org

July 30, 2015

Oregon Water Resources Dept.
Attn: Jon Unger, Grant Specialist
725 Summer St. NE, Suite A
Salem OR 97301

LETTER OF SUPPORT FOR SECURED AND PENDING MATCH FUNDS

Dear Mr. Unger,

This letter is in support of Wasco County SWCD Grant Application for Mosier Valley Commingling Well Evaluations.

Through its budgeting process for the July 1, 2015 to June 30, 2016 fiscal year, The District Board of Directors adopted a budget authorizing \$130,000 for well evaluations and in excess of \$10,000 for administrative support of the effort.

We are confident that a similar figure of at least \$130,000 will be approved for the following fiscal year (2016-2017) as well. In FY 13-14 and FY 14-15 the board approved \$160,000 and \$195,000 respectively which demonstrates a long term commitment.

Further, the District has coordinated with Mosier Watershed Council for the tracking of their time and effort during the current biennium to show their anticipated \$10,000 in-kind match.

The District is committed to assisting Mosier Watershed Council and the local community in Mosier solve their groundwater aquifer problem and is grateful for the opportunity to seek assistance from Oregon Water Resources Dept. to accelerate that effort.

Sincerely,

A handwritten signature in blue ink that reads 'Ron Graves'.

Ron Graves
Project Manager

C: file c, p

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SALEM, OR

July 29, 2015
Oregon Water Resources Department
Attention: Jon Unger, Grant Specialist
725 Summer Street NE, Suite A
Salem, OR 97301

Dear Jon,

The Mosier Watershed Council fully supports the Wasco County SWCD grant application for evaluation of wells in the Mosier area.

Water levels in the Mosier area have declined over 200' in the past 40 years. A USGS study showed that the likely cause is commingling wells that allows water to flow out of aquifer storage and into the creek. A further study showed that Artificial Recharge will not be successful unless we first fix our leaking wells. Finding and fixing our commingling wells is essential for the success of any water conservation efforts in the Mosier area. If we don't stop the leaking, we won't be able to use our groundwater.

Recently, we received a promise of \$1,000,000 in funding in order to fix our leaking wells. The prerequisite to fixing wells is to perform field evaluations in order to find the wells that are predicted to be leaking. The money from this grant will be a critical component to our ability to evaluate a significant portion of the 150 wells identified by the USGS as possibly commingling.

We urge you to support the Wasco SWCD/Mosier Watershed Council grant application. Without water our community will dry up and blow away.

Best Regards,



Bryce Molesworth
Mosier Watershed Council Co-Chair

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SALEM, OR



Natural Resources
Conservation Service

July 29, 2015

The Dalles Field
Office

2325 River Road #3
The Dalles
Oregon, 97058

Voice 541.296.6178
Fax 855.651.8899

Oregon Water Resources Department
725 Summer st. NE, Suite A
Salem OR 97301
Attn: Grant Specialist

To Whom It May Concern:

The Natural Resources Conservation Service (NRCS) has been working with the Wasco Soil and Water Conservation District in Wasco County since 1942. During that time our partnership has tackled large and small resource concerns in the county. Some of the most notable are the Buck Hollow Watershed project, which was the first of its kind in Oregon. In other projects we have partnered with numerous other conservation agencies including OWEB, OWRD, BPA, Watershed Councils, Wy'East RC&D Oregon Freshwater Trust and the irrigators of Fifteenmile Creek to conserve water and voluntarily turn water back into the stream for water quality and to preserve steelhead habitat in the stream.

The issue in Mosier is somewhat unique to our partnership and the solution will take ingenuity and long term commitments from our partners to solve the issue. NRCS is committed to assisting where possible to reduce the ground water co-mingling issues. Currently, the need is to identify the problem wells and then focus funding on fixing them. At this time, NRCS does not have a practice standard to assist landowners in either identifying the troublesome wells or re-casing the wells once they are identified. This is where our producers will rely on funders like you and the SWCD to fulfil this need. NRCS will continue to provide technical support for this project and look for opportunities to assist the agricultural producers conserve water.

I support the SWCD efforts to complete this well evaluation phase of this project.

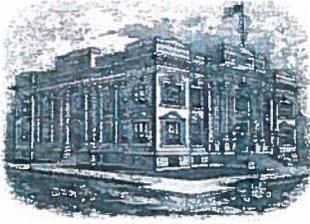
Sincerely,

Beau J. Sorenson
District Conservationist, Wasco County NRCS

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WASCO COUNTY

ADMINISTRATIVE OFFICES

Suite 101
511 Washington Street
The Dalles, Oregon 97058
(541) 506-2550
Fax (541) 506-2551

Tyler Stone
Administrative Officer
HUMAN RESOURCES
(541) 506-2775

FINANCE
(541) 506-2770

INFORMATION SERVICES
(541) 506-2554

FACILITIES
(541) 506-2553

July 29, 2015

To Whom it May Concern

Re: Wasco County Soil and Water Conservation District's Application for Water Conservation, Reuse and Storage Feasibility Study Grant Program

Over the past 40 years, Mosier Groundwater levels have declined 150-200 feet negatively impacting home sales, local agriculture and economic development. Local growers, Wasco County Soil and Water Conservation District, Mid-Columbia Economic Development District, the USDA Forest Service and USGS invested nearly \$610,000 for a USGS groundwater study that demonstrated declining aquifer levels to be almost entirely caused by poorly constructed wells that enable aquifers to commingle – despite rules intended to prevent such poor construction.

The community of Mosier is working diligently to identify and replace existing commingling wells but it is a herculean task that needs to be organized and managed to facilitate the most effective and efficient means to move forward. A feasibility study will provide a solid foundation for action to benefit not only the current residents and agricultural producers in the area but will continue to provide a safe and reliable source of water for future generations.

Wasco County strongly endorses the Wasco County Soil and Water Conservation District's application for the Water Conservation, Reuse and Storage Feasibility Study Grant Program.

Thank you,

Tyler Stone
Wasco County Administrative Officer

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CITY OF MOSIER
small enough to make a difference

PO Box 456 | 208 Washington Street, Mosier, OR 97040
Phone: 541.478.3505 | www.CityofMosier.com

July 29, 2015

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

Dear Jon,

The City of Mosier fully supports the Wasco County SWCD and Mosier Watershed Council grant application for evaluation of wells in the Mosier area.

Declining wells levels are a major issue in the Mosier area and issues with Mosier wells have greatly impacted scarce City resources. Finding and fixing our commingling wells is essential for the success of any water conservation efforts in the Mosier area. If we don't stop the leaking, we won't be able to use our groundwater.

The City of Mosier replaced its own commingling well. Now the effort must be expanded to include rural landowners. Commingling wells must be identified so that they can be repaired or replaced. Otherwise no conservation of water will be possible because it will be lost through leaking wells.

We urge you to support the Wasco SWCD/Mosier Watershed Council grant application. Water is vital to the economic and social foundations of the Mosier community.

Sincerely,

Arlene Burns

Arlene Burns
Mosier City Mayor

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Request to be added to the Oregon Water Resources Department's
Inventory of Potential Conservation Opportunities

The purpose of this inventory is to catalogue potential conservation projects that water users themselves have identified but not yet pursued because of financial, institutional, or other barriers. For the purpose of this application, water storage other than above-ground are included as conservation opportunities and are most likely capital conservation projects.

As a water provider or user, you know your water demands and water conservation opportunities better than anyone. We would appreciate your assistance with this important data collection effort by completing this survey. Your participation will help provide the building blocks we need to begin to identify and achieve potential future water supplies. Please answer the questions as completely as possible, to the best of your ability. We appreciate your help with this important effort.

This inventory of already-identified, potential conservation projects includes both capital and programmatic projects. Capital projects are defined as one-time, large investments resulting in water savings. Examples include reclaimed water plants, reservoir covering, transmission line upgrades reducing leaks, or industrial engineering modifications to re-use process water. Programmatic projects are defined as ongoing investments resulting in water savings. Examples include facilitating upgrades to more efficient water using devices (e.g., distributing free showerheads, toilet rebates) and distribution system leak detection programs. The conservation inventory is primarily intended to include "planned" projects rather than projects that are currently being implemented. However, currently active programmatic projects may be listed if they will continue or expand in future years. The inventory of projects submitted will be compiled by county or basin.

Examples are provided below.

	Example Capital Conservation Project	Example Programmatic Conservation Project
Project Description Provide brief sentence	Line 3 miles of unlined ditch.	Toilet rebate program for residential customers
Estimated Future Savings Provide brief sentence, including information regarding savings seasonality.	20 acre feet of water per year	If we spend our full budget each year, we estimate 50,000 gallons of water save per year
Seasonality Indicate what part of the year savings are generated (e.g. year-round; summer only; etc.).	Peak (irrigation) season savings.	Savings should occur throughout the year.
Estimated Future Costs Provide brief sentence.	\$500,000 total project costs.	\$40,000 a year.
Implementation Schedule Provide brief sentence.	Not set. Have conducted cost and savings estimate, but still seeking funding.	We started the program in 2005 and plan to implement until 2015.
Project Funded? Designate either "yes", "no", or provide brief sentence if necessary	No. Pursuing grant funding.	Yes. IN our CIP through the next 5 years.

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To add a project to the inventory of potential conservation opportunities, please provide the following information for each conservation project.

This is a <input checked="" type="checkbox"/> Capital Conservation Project <input type="checkbox"/> Programmatic Conservation Project	
Project #/Name	Mosier Co-mingling Well Remediation
Project Description	Repair or Decommission and Replace Co-mingling wells in Mosier Valley
Estimated Future Savings	806 ac ft. of groundwater per year (based on 50 wells co-mingling at 10 gpm)
Seasonality	Year round
Estimated Future Costs	\$1.25-2.0 million total project costs
Implementation Schedule	Anticipate starting spring 2017. Need to finish well evaluations first which is underway.
What are the barriers to implementation, e.g. funding?	\$1.0 million for repairs identified. Pursuing additional grant funding.
This is a <input type="checkbox"/> Capital Conservation Project <input type="checkbox"/> Programmatic Conservation Project	
Project #/Name	
Project Description	
Estimated Future Savings	
Seasonality	
Estimated Future Costs	
Implementation Schedule	
What are the barriers to implementation, e.g. funding?	

- Include this form with your application -

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