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

I. Grant Information

Study Name: *Eastside Aquifer Recharge and Recovery Pumping Test*

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: $ $44,000
Note: Request may not exceed $500,000

Total Cost of Feasibility Study: $ $119,000

II. Applicant Information

Applicant Name: *Walla Walla Basin Watershed Council*		**Co-Applicant Name:**
Address:	*810 South Main St*	Address:
	Milton-Freewater, OR 97862	
Phone:	*541-938-2170*	Phone:
Fax:	*541-938-2170*	Fax:
Email:	*steven.patten@wwbwc.org*	Email:

Principle Contact: *Steven Patten*	
Address:	*810 South Main St*
	Milton-Freewater, OR 97862
Phone:	*541-938-2170*
Fax:	*541-938-2170*
Email:	*steven.patten@wwbwc.org*

Certification:

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

Applicant Signature: _____ Date: *2/1/2016*

Print Name: *Steven Patten* Title: *Sr. Environmental Scientist*

III. Feasibility Study Summary

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

A pumping test(s) will be conducted within the Eastside subbasin to gather aquifer characteristics such as transmissivity, hydraulic conductivity, storativity and others to determine the feasibility of utilizing the Eastside subbasin aquifer for aquifer recharge and recovery to improve instream flows in the Walla Walla River near Milton-Freewater, OR. The proposed project would allow irrigators the ability to divert water in the winter/spring time to store in the Eastside subbasin aquifer for later use during low-flow months (typically July-Sept). Instead of diverting water from the Walla Walla River during these low flow months, Eastside irrigators could withdraw stored water from the Eastside subbasin aquifer thereby improving flows in the Walla Walla River. This study will focus on conducting aquifer pumping test(s) which will provide the information to determine aquifer characteristics and the feasibility of the proposed project.

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.

   Goal: Develop an increased understanding of the Eastside subbasin aquifer system and its potential for aquifer recharge and recovery.

   This study will help achieve the goal by conducting pumping test(s) within the aquifer system in question to help answer whether the Eastside subbasin system is a good candidate for aquifer recharge and recovery to improve instream flows during low flow conditions and water supply needs in the Walla Walla River. The pumping test(s) will create the data needed to determine aquifer characteristics which will be used to determine an estimate for groundwater storage and recovery in the Eastside subbasin.

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."

   As seen in the attached water availability analysis, there is not enough water during the summer months to meet both instream and out of stream needs. This project would divert water during the months when water is avaialble (Dec-May - assuming instreams flow requirements are met) to help meet out of stream demands during the low-flow months (Jul-Sept). Also attached is a hydrograph for the S-107 Walla Walla River at Tumalum Bridge (downstream of the proposed project) showing low flow conditions during the summer of 2013 and 2014. Instream flows would be improved by utilizing stored water within the aquifer instead of diverting water from the Walla Walla River.

   Critical local water supply needs are to maintain out of streams uses while improving instream flows for environmental/fish/wildlife purposes (Walla Walla Subbasin Plan - 2004, Walla Walla Basin Integrated Flow Enhancement Study Phase 1 - 2015, Walla Walla River Temperature TMDL - 2005)

   Regional needs for improved instream flows during low flow periods (Mid-Columbia Steelhead DPS Recovery Plan and Bull Trout Recovery Plan)

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 Eastside subbasin can withdraw approximately 7 cfs for out of stream uses. This project is proposed to reduce diversions from the river during up to four months (June through September). This equals 122 days, at 7 cfs per day (13.68 acre-feet a day) = 1,691 acre-feet. Due to inefficiencies of groundwater storage, this number will be almost doubled to 3,000 acre-feet for the project. Therefore, with a proposed reduction in withdrawals of 1,691 AF and the project water supply need of 3,000 acre-feet, and the WWR water availability summary of at least 30+cfs available from the Walla Walla River from Dec to May, the project could meet 99.6% of the proposed water supply needs for the Eastside subbasin during the June to September months.

Project water = 10 cfs (19.8 acre-feet per day) for 151 days (Dec 1 to April 30) = 2,990 acre-feet.

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

This grant would fund at least one, but likely multiple, pumping tests within the Eastside subbasin to provide data to be utilized to determine aquifer characteristics such as transmissivity, hydraulic conductivity, storativity and others. These values, along with other existing data (groundwater levels, river flow and others) will help determine if the Eastside subbasin is an appropriate system to operate an aquifer recharge and recovery project. Currently, the Quality Assurance Project Plan is being written to develop the exact technical aspects of the project. This will be submitted to OWRD and WDOE (already funding the project) for review and comments.

Through a series of faults within the Columbia River Basalt Group, the Walla Walla Valley is defined by upwards of 800 feet of Mio-Pliocene age and more recent alluvial sediments. Headwaters of the Walla Walla River and its tributaries originate in the Blue Mountains and eventually converge within the Walla Walla Valley-upon the alluvial aquifer. Due to the highly permeable nature of the alluvial sediments, seepage loss from surface water bodies, including the mainstem Walla Walla River, to the alluvial aquifer can be very significant in some regions of the valley.

Since 2004 the WWBWC has been monitoring the valley's hydrology while developing several alluvial aquifer recharge (AR) projects. Monitoring data has shown these AR projects over the last several years have had multiple benefits; from the reactivation of spring creeks and biological enhancement through flow, to the documentation of longterm aquifer-storage gains. Through past and present Oregon Watershed Enhancement Board (OWEB), Bonneville Power Administration (BPA) , and Washington Department of Ecology (WDOE) funding, the WWBWC continues to develop additional AR projects. During the course of developing these AR projects, coupled with ongoing stream flow monitoring and alluvial aquifer monitoring, the WWBWC and watershed stakeholders have discussed the need for a strategic plan to better focus AR effort and funding. This stratigec plan was completed by the WWBWC in 2013.

The "Eastside" sub-basin of the alluvial aquifer is underlain by 300 to 500 feet of alluvial material, with much of the upper 200 feet being very coarse grained. This region is bound by the mainstem Walla Walla River to the west and basalt to the south and east. Historical groundwater declines in this region have exceeded 40 feet in some cases. Due to the high permeability of the sediments, a strong downward hydraulic gradient away from the river exists between the Walla Walla River and the adjacent Eastside sub-basin.

Unlike many other sub-basins in the valley, the Eastside sub-basin has restricted or limited recharge potential. Using field observations and the IWFM we have been able to demonstrate the recharge of the alluvial aquifer across the Walla Walla valley in a given year is primarily through surface-water infiltration of the one of the many streams, spring creeks, or irrigation canals and the purpose built aquifer recharge sites. The IWFM model simulates Walla Walla Valley hydrology including surface water, groundwater, and crop demands. The Eastside area, however, is limited by the lack of ditributary channels, the leveeing of the River itself, the River down-cutting 10+ feet, the lack of aquifer recharge projects and the lack of any open irrigation canals. Annual recharge of the local sub-basin in the Eastside region is by and large limited to seepage loss from the mainstem Walla Walla River (although limited by the down-cutting), percipitation that falls within the subbasin and excess irrigation water that ultimately percolates to the aquifer.

Due to the historical groundwater declines, it appears from initial calculations - based upon geologic data and past and present water level data, that 2,500 to 5,000 acre-feet of aquifer storage may be available in the Eastside sub-basin. Water stored in the aquifer could potentially be re-used during irrigation months for instream flow benefit as well as serve as a mechanism to reverse the increasing seepage loss trend being monitored in the river. Establishing aquifer characteristics will further our understanding of the Eastside subbasin and its potential to be used for an aquifer recharge and recovery project to improve water supply needs in the Walla Walla River.

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.)

(i) Quality Assurance Project Plan development and review

(ii) January 2016 - March 2016

(iii) Write a QAPP document and submit to OWRD and WDOE for review and comments.

(iv) WWBWC staff and Hydrogeologists with Northwest Land and Water (NLW) to develop/write the QAPP.

(i) Conduct Pumping Test(s)

(ii) February 2016 - February 2017

(iii) Conduct at least one pumping test within the Eastside subbasin to establish aquifer characteristics.

(iv) NLW with support from WWBWC staff along with any needed well/pump contractors

(i) Write Report

(ii) March 2016 - May 2017

(iii) Create report detailing pumping test conditions, data, data analysis and summary of the potential for aquifer recharge and recovery in the Eastside subbasin.

(iv) NLW with support from WWBWC staff

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.

Umatilla Basin - Walla Walla River Basin, Umatilla County, Township 6N, Range 35E,

Sections 25 and 36 and Township 6N, Range 36E, Sections 30 and 31.

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

Walla Walla River - river mile 46.6. The Walla Walla River is a tributary to the Columbia River

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

Below-ground storage

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

See attached report from OWRD water availability reporting system

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

Stored water will be used to meet out of stream uses during low flow months (June-Sept) instead of diverting live flows from the Walla Walla River.

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

The project concept currently would divert 10 cfs of water from the Walla Walla River during December 1 to April 30 assuming instream flow values are being met. The rate of diversion, including other aquifer recharge diversions, would not exceed 10% of the 2-year flow event. According to the Corps of Engineers, the 2-year flow event at Milton-Freewater, OR is approximately 1,200 cfs. 10% of this would 120 cfs. The project would propose to divert 10 cfs along with the current 45 cfs already available for aquifer recharge projects west of the Walla Walla River.

Water quality requirements would most likely fall in line with the current requirements for the aquifer recharge program in the Walla Walla Basin. The WWBWC has an approved water quality and water level monitoring plan in place with ODEQ. If the Eastside subbasin project were to move forward, the WWBWC would proposed utilizing the existing water quality plan because the new project would be using the same source water as is currently being diverted for other aquifer recharge projects.

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 required to perform a pumping test for aquifer characterization. Monitoring wells are already established.

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.

   Support by the Walla Walla Basin Integrated Flow Enhancement Study Steering Committee, the Walla Walla Watershed Management Partnership and the Walla Walla River Irrigation District.

The Walla Walla River Irrigation District supports the feasibility study to determine whether the Eastside subbasin project could provide an alternate water supply for their users. Also, the Confederated Tribes of the Umatilla Indian Reservation are interested in exploring cooperative ways to increase Walla Walla River flows for fish.

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

   Matching funds from WDOE Office of Columbia River - Secured January 27th, 2016 - Must be used before June 30th, 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.

WWBWC staff:

Steven Patten, WWBWC Senior Environmental Scientist, will be providing project oversight to the Eastside pumping test project. Steven leads the WWBWC's aquifer recharge program. He has experience designing, constructing and operating varies types of aquifer recharge projects. Education:Walla Walla University Master of Science in Biology - June 2009, Bachelor of Science in Biology - June 2007

Troy Baker, WWBWC Monitoring and GIS Program Manager, will be providing GIS and monitoring support for the Eastside ASR project. Troy has created GIS outputs for a variety of projects including the geologic layers created for the Walla Walla Valley, water table maps and other outputs.

Brian Wolcot, WWBWC Executive Director, will be providing project oversight to the Eastside ASR project as well. Brian has experience working on irrigation diversion and in-stream projects.

Northwest Land and Water Staff:

James Mathieu, Principal Hydrogeologist - Jim brings 24 years of consulting experience to his role as president of NLW. Over the last 15 of these years, he has focused on projects that involve managing water for people, fish, and wildlife. His experience spans all aspects of water resource investigations, from field testing and data acquisition to complex hydraulic analyses and modeling. He also specializes in water supply and water rights investigations, resource protection, and the analysis of stream-aquifer interactions. Jim has successfully managed large drilling and testing investigations involving multiple subcontractors. M.S. Hydrology, 1989 University of Arizona, B.A. Geology, 1984, University of California, Santa Barbara, Registered Geologist, Oregon

Laura Strauss, Principal Hydrogeologist/Hydrogeochemist - Laura Strauss has over 25 years of hydrogeologic consulting experience. In addition to strengths in hydraulics and conceptual modeling, she offers specialized skills in the analysis and interpretation of isotope geochemistry data. She uses a variety of tools — including databases, groundwater flow models, GIS, and Viewlog — to develop 3D subsurface models and cross-sections. Her experience also extends to artificial recharge, groundwater development / management, and environmental projects. One area of her expertise entails using isotope and hydraulic analyses to characterize the interactions between streams and underlying aquifers M.S. Geology, 1986, University of Arizona, B.A. Geology / Environmental Studies, 1983, University of California, Santa Barbara. Licensed Geologist / Licensed Hydrogeologist, Washington

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.

First, the QAPP will be developed and reviewed by OWRD and WDOE. WWBWC and NLW will work to develop, distribute and modify the QAPP.

Second, NLW will coordinate the pumping test with landowners, any well/pump subcontractors, and the monitoring network to capture data for the pumping test. The pumping test will optimally happen when application of irrigation water is not occurring or is limited in the area of the pumping test.

Third, NLW will write a draft report detailing activities, data, analysis and estimation of the subbasin's aquifer for recharge and recovery.

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?	☐ Yes	☐ No
Will the project impound surface water on a perennial stream?	☐ Yes	☐ No
Will the project divert water from a stream that supports sensitive, threatened or endangered species?	☐ Yes	☐ No

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

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

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

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

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

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

Is the proposed storage project for municipal use?

☐ Yes ☐ No

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

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

Proceed in addressing the following items:

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

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

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

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

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

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

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

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

This analysis will be included in the final report. This will look at historical flow data from both OWRD and WWBWC gauge stations to determine the proposed projects impact on instream flows. We will consult with ODFW and CTUIR fisheries. Operation of the current aquifer recharge projects requires that minimum instream flows to be met, per their OWRD Limited License. The diverted water used for the proposed project would be a very small portion of any flushing/maintenance flows needed to do work on the river. The Walla Walla River is a distributary river system that historically would spread out across its alluvial fan and the valley floor near Milton-Freewater, OR. The project, along with the aquifer recharge program, helps to simulate these lost flood plain functions (due to levee construction and headgates on distributary channels).

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.

Comparative analyses will be investigated in the report. Alternatives to this proposal would be for large scale above ground storage or aquifer recharge and recovery in the basalt aquifer. Large scale storage options have been investigated by the Corps of Engineers and are now being revisited in another feasibility assessment. Aquifer recharge and recovery into the basalt aquifer is a possible option, however, higher pumping costs would make for higher construction and on-going costs. Also, the alluvial project would benefit the Walla Walla River by helping to reduce the hydraulic gradient pulling water away from the river. The Eastside irrigation system is already piped and irrigators use sprinklers or micro-sprinklers, thus there is very limited gain from further effecincy in the sub-basin.

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

Primary concern would be withdrawal of water from the river and the impact on instream flows. Additionally, source water quality would be addressed to ensure no degradation of the aquifer system.

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.

The Walla Walla River Irrigation District and Hudson Bay District Improvement Company are abiding by a non-formal settlement agreement from 2000, where 25 cfs is left instream during the summer. This project will provide an additional water on top of the 25 cfs currently left instream during the summer. The project would be able to add the additional water during the low flow months of June-Sept, assuming 1,700 acre-feet was recovered for irrigation use. The reach directly downstream of the Eastside diversion has the lowest flow found in the Oregon portion of the Walla Walla River potentially limiting fish access to better upstream habitat. This additional water would make a signficant difference to the amount of water in the river as well as improving water temperatures.

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.

   This project may have been added in the previous feasability grant.

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.

   There are no known permitting requirements for the proposed activities. Property ownership is all private. WWBWC and NLW will obtain permission to conduct the pumping test/monitoring from all landowners.

V. Match Funding Information

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

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

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

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	**Type** (✓ One)	**Status** (✓ One)	**Amount/ Dollar Value**	**Date Match Funds Available** *(Month/Year)*
WDOE - Office of Columbia River	☒ cash ☐ in-kind	☒ secured ☐ pending	*$75,000*	*January 2016*
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		

VI. Feasibility Study Schedule

Estimated Study Duration: <u>February 1, 2016</u> to <u>May 1, 2017</u>

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

	2016			2017				2018 & Beyond
Feasibility Study Key Tasks	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	
Develop/Review/Finalize QAPP	X							
Conduct Pumping Test(s)	X		X	X				
Collect Data, Analysis, Write Report	X	X	X	X	X			
Get Landowner permissions	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	*160*	*$59.00*		*$5,000*	*$4,440*	*$9,440*
Contractual/Consulting				*$70,000*	*$35,560*	*$105,560*
Equipment (must be approved)						
Supplies						
Other:						
Administrative Costs**					*$4,000*	
Total for Section A				*$75,000*	*$44,000*	*$119,000*
Percentage for Section A				***63%***	***37%***	***100%***

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

Section B

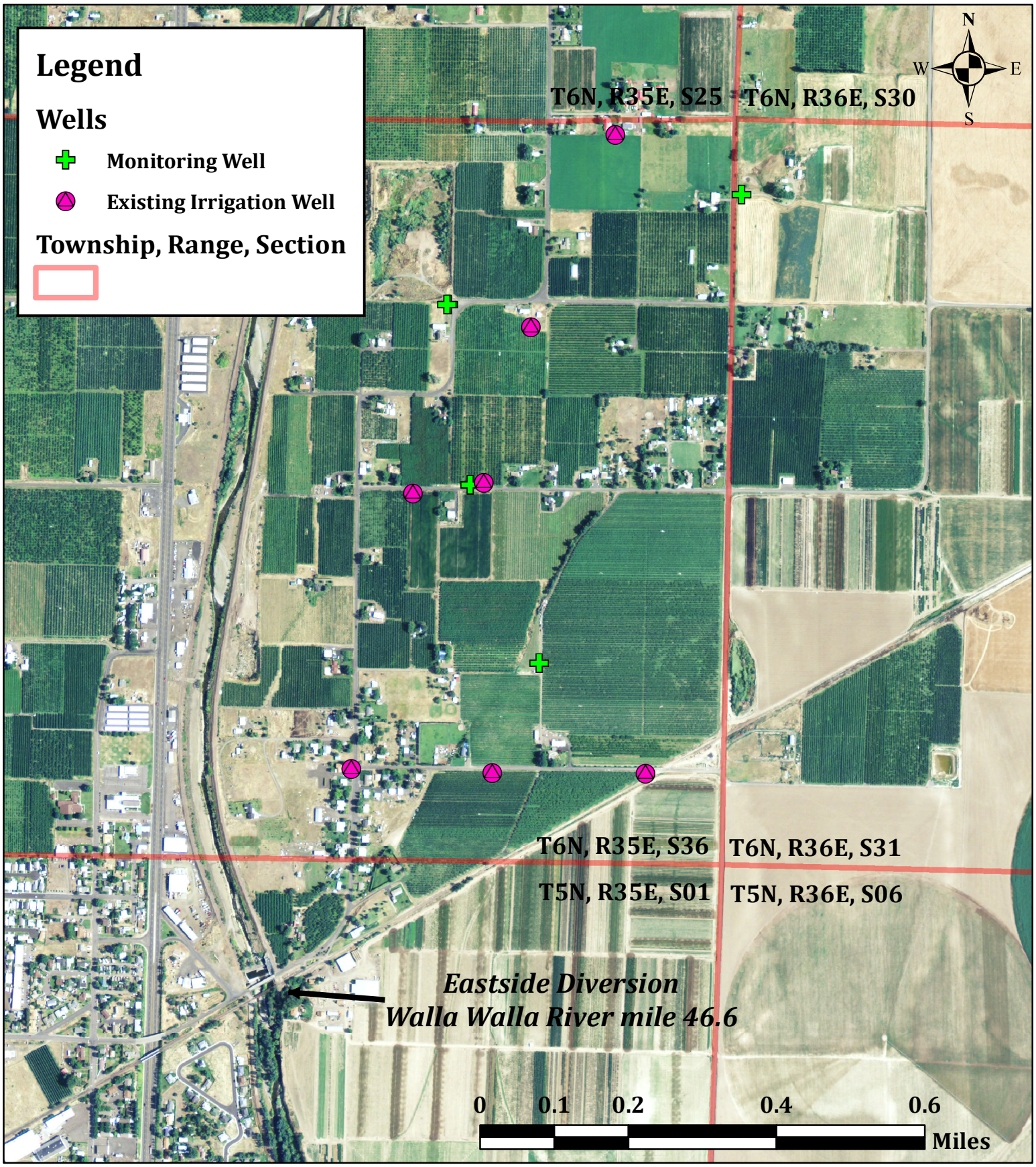
If grant amount requested is $50,000 or greater, you MUST complete Section B. Key Tasks in Section B should be the same as the Key Tasks in Section VI (Feasibility Study Schedule).

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

Totals in Section B must match the totals in Section A

Eastside Aquifer Recharge and Recovery Pumping Test

Umatilla Basin, Walla Walla River Basin, Umatilla County



Map Created January 31, 2016
By Steven Patten
Note: Existing Irrigation Well locations are approximate.

Walla Walla Basin Watershed Council

Oregon Water Resources Department
Water Availability Analysis

Main Help
Return Contact Us

Water Availability Analysis

WALLA WALLA R > COLUMBIA R - AB LITTLE WALLA WALLA R
UMATILLA BASIN
Water Availability as of 1/31/2016

Watershed ID #: 223 (Map) Exceedance Level: 50%
Date: 1/31/2016 Time: 11:14 AM

Download Data

Water Availability

Select any Watershed for Details

Nesting Order	Watershed ID #	Stream Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sto
1	30710208	WALLA WALLA R> COLUMBIA R- AB BIRCH CR	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes
2	**223**	**WALLA WALLA R> COLUMBIA R- AB LITTLE WALLA WALLA R**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**

Limiting Watersheds

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Limiting Watershed ID #	Stream Name	Water Available?	Net Water Available
JAN	223	WALLA WALLA R > COLUMBIA R - AB LITTLE WALLA WALLA R	Yes	52.30
FEB	223	WALLA WALLA R > COLUMBIA R - AB LITTLE WALLA WALLA R	Yes	102.00
MAR	223	WALLA WALLA R > COLUMBIA R - AB LITTLE WALLA WALLA R	Yes	134.00
APR	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	153.00
MAY	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	83.60
JUN	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-82.70
JUL	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-103.00
AUG	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-102.00
SEP	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-87.90
OCT	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-79.20
NOV	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-27.20
DEC	223	WALLA WALLA R > COLUMBIA R - AB LITTLE WALLA WALLA R	Yes	38.30
ANN	223	WALLA WALLA R > COLUMBIA R - AB LITTLE WALLA WALLA R	Yes	33,800.00

Detailed Reports for Watershed ID #30710208

WALLA WALLA R > COLUMBIA R - AB BIRCH CR
UMATILLA BASIN
Water Availability as of 1/31/2016

Watershed ID #: 30710208 (Map) Exceedance Level: 50%
Date: 1/31/2016 Time: 11:14 AM

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second

Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	207.00	118.00	88.80	0.00	0.00	88.80
FEB	258.00	118.00	140.00	0.00	0.00	140.00
MAR	304.00	137.00	167.00	0.00	0.00	167.00
APR	348.00	195.00	153.00	0.00	0.00	153.00
MAY	327.00	243.00	83.60	0.00	0.00	83.60
JUN	165.00	248.00	-82.70	0.00	0.00	-82.70
JUL	98.00	201.00	-103.00	0.00	0.00	-103.00
AUG	78.60	181.00	-102.00	0.00	0.00	-102.00
SEP	92.90	181.00	-87.90	0.00	0.00	-87.90
OCT	97.60	177.00	-79.20	0.00	0.00	-79.20
NOV	138.00	165.00	-27.20	0.00	0.00	-27.20
DEC	186.00	132.00	54.30	0.00	0.00	54.30
ANN	139,000.00	127,000.00	41,200.00	0.00	0.00	41,200.00

Detailed Report of Consumptive Uses and Storage

Consumptive Uses and Storages in Cubic Feet per Second

Month	Storage	Irrigation	Municipal	Industrial	Commercial	Domestic	Agricultural	Other	Total
JAN	0.01	19.50	95.00	3.10	0.00	0.32	0.20	0.00	118.00
FEB	0.02	19.70	95.00	3.10	0.00	0.32	0.20	0.00	118.00
MAR	0.11	37.90	95.00	3.10	0.00	0.32	0.20	0.00	137.00
APR	0.07	95.90	95.00	3.10	0.00	0.32	0.20	0.00	195.00
MAY	0.00	145.00	95.00	3.10	0.00	0.32	0.20	0.00	243.00
JUN	0.00	149.00	95.00	3.10	0.00	0.32	0.20	0.00	248.00
JUL	0.00	103.00	95.00	3.10	0.00	0.32	0.20	0.00	201.00
AUG	0.00	82.40	95.00	3.10	0.00	0.32	0.20	0.00	181.00
SEP	0.00	82.10	95.00	3.10	0.00	0.32	0.20	0.00	181.00
OCT	0.00	78.20	95.00	3.10	0.00	0.32	0.20	0.00	177.00
NOV	0.00	66.60	95.00	3.10	0.00	0.32	0.20	0.00	165.00
DEC	0.00	33.10	95.00	3.10	0.00	0.32	0.20	0.00	132.00

Detailed Report of Reservations for Storage and Consumptive Uses

Reserved Streamflow in Cubic Feet per Second

No reservations were found for this watershed.

Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

No instream flow requirements were found for this watershed.

Detailed Reports for Watershed ID #223

WALLA WALLA R > COLUMBIA R - AB LITTLE WALLA WALLA R

UMATILLA BASIN

Water Availability as of 1/31/2016

Watershed ID #: 223 (Map)

Date: 1/31/2016

Exceedance Level: 50%

Time: 11:14 AM

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	221.00	98.70	122.00	0.00	70.00	52.30
FEB	296.00	98.70	197.00	0.00	95.00	102.00
MAR	328.00	98.90	229.00	0.00	95.00	134.00
APR	397.00	101.00	296.00	0.00	95.00	201.00
MAY	392.00	104.00	288.00	0.00	95.00	193.00
JUN	207.00	106.00	101.00	0.00	70.00	31.00
JUL	124.00	112.00	12.20	0.00	50.00	-37.80
AUG	107.00	109.00	-2.14	0.00	50.00	-52.10
SEP	111.00	104.00	6.90	0.00	50.00	-43.10
OCT	115.00	99.90	15.10	0.00	30.00	-14.90
NOV	155.00	98.70	56.30	0.00	30.00	26.30
DEC	207.00	98.70	108.00	0.00	70.00	38.30
ANN	160,000.00	74,300.00	86,100.00	0.00	48,200.00	46,800.00

Detailed Report of Consumptive Uses and Storage

Consumptive Uses and Storages in Cubic Feet per Second

Month	Storage	Irrigation	Municipal	Industrial	Commercial	Domestic	Agricultural	Other	Total
JAN	0.01	0.00	95.00	3.10	0.00	0.32	0.20	0.00	98.70
FEB	0.02	0.00	95.00	3.10	0.00	0.32	0.20	0.00	98.70
MAR	0.11	0.09	95.00	3.10	0.00	0.32	0.20	0.00	98.90
APR	0.07	2.46	95.00	3.10	0.00	0.32	0.20	0.00	101.00
MAY	0.00	5.26	95.00	3.10	0.00	0.32	0.20	0.00	104.00
JUN	0.00	7.39	95.00	3.10	0.00	0.32	0.20	0.00	106.00
JUL	0.00	13.10	95.00	3.10	0.00	0.32	0.20	0.00	112.00
AUG	0.00	10.50	95.00	3.10	0.00	0.32	0.20	0.00	109.00
SEP	0.00	5.44	95.00	3.10	0.00	0.32	0.20	0.00	104.00
OCT	0.00	1.26	95.00	3.10	0.00	0.32	0.20	0.00	99.90
NOV	0.00	0.00	95.00	3.10	0.00	0.32	0.20	0.00	98.70
DEC	0.00	0.00	95.00	3.10	0.00	0.32	0.20	0.00	98.70

Detailed Report of Reservations for Storage and Consumptive Uses

Reserved Streamflow in Cubic Feet per Second

No reservations were found for this watershed.

Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

Application #	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MF223A	CERTIFICATE	70.00	95.00	95.00	95.00	95.00	70.00	50.00	50.00	50.00	30.00	30.00	70.00

Maximum	70.00	95.00	95.00	95.00	95.00	70.00	50.00	50.00	50.00	30.00	30.00	70.00

Oregon Water Resources Department
Water Availability Analysis

Main Help
Return Contact Us

Water Availability Analysis

WALLA WALLA R > COLUMBIA R - AB BIRCH CR
UMATILLA BASIN
Water Availability as of 1/31/2016

Watershed ID #: 30710208 (Map) Exceedance Level: 50%
Date: 1/31/2016 Time: 11:10 AM

Download Data

Water Availability

Select any Watershed for Details

Nesting Order	Watershed ID #	Stream Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sto
1	30710208	WALLA WALLA R> COLUMBIA R- AB BIRCH CR	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes

Limiting Watersheds

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Limiting Watershed ID #	Stream Name	Water Available?	Net Water Available
JAN	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	88.80
FEB	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	140.00
MAR	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	167.00
APR	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	153.00
MAY	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	83.60
JUN	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-82.70
JUL	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-103.00
AUG	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-102.00
SEP	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-87.90
OCT	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-79.20
NOV	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	No	-27.20
DEC	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	54.30
ANN	30710208	WALLA WALLA R > COLUMBIA R - AB BIRCH CR	Yes	41,200.00

Detailed Reports for Watershed ID #30710208

WALLA WALLA R > COLUMBIA R - AB BIRCH CR
UMATILLA BASIN
Water Availability as of 1/31/2016

Watershed ID #: 30710208 (Map) Exceedance Level: 50%
Date: 1/31/2016 Time: 11:10 AM

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	207.00	118.00	88.80	0.00	0.00	88.80
FEB	258.00	118.00	140.00	0.00	0.00	140.00
MAR	304.00	137.00	167.00	0.00	0.00	167.00
APR	348.00	195.00	153.00	0.00	0.00	153.00
MAY	327.00	243.00	83.60	0.00	0.00	83.60
JUN	165.00	248.00	-82.70	0.00	0.00	-82.70
JUL	98.00	201.00	-103.00	0.00	0.00	-103.00
AUG	78.60	181.00	-102.00	0.00	0.00	-102.00
SEP	92.90	181.00	-87.90	0.00	0.00	-87.90
OCT	97.60	177.00	-79.20	0.00	0.00	-79.20
NOV	138.00	165.00	-27.20	0.00	0.00	-27.20
DEC	186.00	132.00	54.30	0.00	0.00	54.30
ANN	139,000.00	127,000.00	41,200.00	0.00	0.00	41,200.00

Detailed Report of Consumptive Uses and Storage

Consumptive Uses and Storages in Cubic Feet per Second

Month	Storage	Irrigation	Municipal	Industrial	Commercial	Domestic	Agricultural	Other	Total
JAN	0.01	19.50	95.00	3.10	0.00	0.32	0.20	0.00	118.00
FEB	0.02	19.70	95.00	3.10	0.00	0.32	0.20	0.00	118.00
MAR	0.11	37.90	95.00	3.10	0.00	0.32	0.20	0.00	137.00
APR	0.07	95.90	95.00	3.10	0.00	0.32	0.20	0.00	195.00
MAY	0.00	145.00	95.00	3.10	0.00	0.32	0.20	0.00	243.00
JUN	0.00	149.00	95.00	3.10	0.00	0.32	0.20	0.00	248.00
JUL	0.00	103.00	95.00	3.10	0.00	0.32	0.20	0.00	201.00
AUG	0.00	82.40	95.00	3.10	0.00	0.32	0.20	0.00	181.00
SEP	0.00	82.10	95.00	3.10	0.00	0.32	0.20	0.00	181.00
OCT	0.00	78.20	95.00	3.10	0.00	0.32	0.20	0.00	177.00
NOV	0.00	66.60	95.00	3.10	0.00	0.32	0.20	0.00	165.00
DEC	0.00	33.10	95.00	3.10	0.00	0.32	0.20	0.00	132.00

Detailed Report of Reservations for Storage and Consumptive Uses

Reserved Streamflow in Cubic Feet per Second

No reservations were found for this watershed.

Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

No instream flow requirements were found for this watershed.

Steven Patten

From: Gregory, Guy J. (ECY) <GGRE461@ECY.WA.GOV>
Sent: Monday, February 1, 2016 10:31 AM
To: Steven Patten
Subject: RE: Eastside Pumping Test - Email of Support

Steve:

As you requested, I can confirm that Ecology's Office of Columbia River has allocated $75,000 to conduct groundwater pumping test activities in the Eastside sub-basin near Milton-Freewater. The test will be used to quantify aquifer characteristics to assess the feasibility of the proposed Eastside Aquifer Recharge and Recovery project. The results of the test will provide empirical data to determine the potential for groundwater storage and recovery in the Eastside sub-basin.

That work is authorized under Grant WROCR-VER1-WaWWMP-00004 to the Walla Walla Water Management Partnership, who is working cooperatively and in conjunction with the Walla Walla Basin Watershed Council.

We welcome partnerships in funding and performing this, and any other work, that assists in resolving water issues in the Walla Walla watershed. If there are any questions, please contact me.

Guy J. Gregory L.G., L.Hg.
Technical Unit Supervisor
Water Resources Program
Eastern Regional Office
Washington Department of Ecology
N. 4601 Monroe
Spokane, WA 99206

email: guy.gregory@ecy.wa.gov
voice: 509-329-3509
fax: 509-329-3529

From: Steven Patten [mailto:steven.patten@wwbwc.org]
Sent: Monday, February 01, 2016 10:17 AM
To: Gregory, Guy J. (ECY) <GGRE461@ECY.WA.GOV>
Subject: Eastside Pumping Test - Email of Support

Hi Guy,

This is very last minute, but I'm trying to get my proposal pulled together for an Oregon grant to help fund the Eastside Pumping Test project. Could you write a short email of support? I've attached the draft proposal in case you are interested.

Thanks,
Steven

Walla Walla River Irrigation District
323 Evans Street, P.O. Box 248
Milton-Freewater, OR 97862
541-938-0144
wwrid@qwestoffice.net

To whom it may concern,

October 31, 2013

The Walla Walla River Irrigation District owns and operates the Eastside Diversion on the Walla Walla River. We support the Walla Walla Basin Watershed Council's application for grant funding for a feasibility study of aquifer storage and recovery on Eastside.

Sincerely,

Teresa Kilmer

Teresa Kilmer
District Manager
Walla Walla River Irrigation District