Mid-Columbia Resiliency Coordination: Final Report Volume 1



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Small Communities Initiative

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Project Lead:

Benjamin A. Serr, Senior Planner, (509) 724-1699, benjamin.serr@commerce.wa.gov

Washington State Department of Commerce Growth Management Services, Local Government Division 10 North Post Street, Suite 445 Spokane, WA 99201

Cathi Read, SCI Program Manager, (360) 725-3016, cathi.read@commerce.wa.gov

Jon Galow, SCI Project Manager, (509) 847-5021, jon.galow@commerce.wa.gov

Washington State Department of Commerce Small Communities Initiative, Local Government Division 1011 Plum St. SE P.O. Box 42525 Olympia, WA 98504-2525 www.commerce.wa.gov

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Executive Summary

The Department of Health (DOH), Office of Drinking Water formed a partnership in 2017 with the Department of Commerce, Small Communities Initiative (SCI) to work with water systems that are potentially affected by groundwater depletion in the Mid-Columbia Basin (Adams, Franklin, Grant, and Lincoln counties). This project was to build upon previous outreach work DOH had conducted with basin municipalities in 2014, and technical assistance outreach on well level monitoring provided to Group A - Community water systems through Evergreen Rural Water of Washington in 2015 and 2016.

DOH directed this current effort to go beyond just the municipalities. Commerce reached out to 137 Group A – Community water systems in the four-county area that rely on groundwater sources for their drinking water, and together serve about 92,000 residents.

BACKGROUND/NEED FOR PROJECT

Groundwater levels are declining in the Mid-Columbia Basin. Previous studies by the Columbia Basin Groundwater Management Area (GWMA) showed that the majority of the groundwater demand comes from agricultural irrigation. Most of the aquifers in the basin do not readily recharge because of the complex geology.

The majority of the agricultural wells, whose water rights date back to the 1960s, were never meant to be permanent. They were a stopgap until the United States Bureau of Reclamation's Columbia Basin Project (CBP) was completed. However, build out of the project stalled in the 1970s due to funding and later, endangered species issues. Instead of phasing out groundwater usage as planned, pumping of the aquifers has been increasing for almost 50 years, resulting in groundwater declines of over 200 feet in some areas.

Some drinking water systems have already felt the effects of groundwater decline, and they are facing a serious long-term challenge. These water systems are in an area where water is being withdrawn much faster than it can be replaced, they have little control over the demand placed on the aquifers, the cities and towns are economically linked to the farmers using the groundwater, and there is a lack of data for water systems to use for decision-making purposes. The information we gathered suggests that many water systems do not know if or how their wells are being affected.

APPROACH

Commerce's approach was multi-faceted, and included:

Survey of Group A Water Systems

The Department of Commerce sent a survey to 137 Group A - Community water systems in February 2018. Commerce received 57 responses to the survey. A summary of the survey results is located in Appendix C.

Analysis of Existing Water Level Data

Several data sources were researched. We identified multiple data gaps that inhibited in-depth analysis. The Primary data sources were the Department of Ecology, U.S. Geologic Survey, and the Columbia Basin Groundwater Management Area (GWMA) reports.

Outreach Meetings

In the summer of 2018 Commerce organized outreach meetings in each of the four counties to: provide information to the water systems about groundwater conditions based on existing data; talk about well monitoring requirements and why regular measurements are important; report out of the results of the February 2018 survey; and to explore ideas about what could be done to address groundwater decline. An additional presentation was requested for the Lincoln County Mayors' Meeting.

Coordination Efforts

Commerce staff has been coordinating with the Department of Ecology, Washington State University, and Columbia Basin Development League.

Long-Term Groundwater Monitoring Networking Meeting

Commerce held a meeting in Moses Lake in December 2018 to discuss the idea of a Long-term Groundwater Monitoring Program for the Mid-Columbia Basin. Federal, state, and local agencies were invited to discuss and brainstorm about what a long-term groundwater monitoring program could look like given the resources of the different organizations. The main outcomes of a well monitoring program would include:

- O Data collection will inform decision makers about existing groundwater supplies.
- It will identify areas of investment for water infrastructure projects and the development of alternative water supplies.
- O It can be used to improve public awareness about water use in the Columbia Basin.

Three alternative approaches to achieve these outcomes were developed by the group. They vary in cost and by who implements the approach.

Coalition Building

Starting In March 2019, Commerce began a series of five facilitated meetings to support forming a coalition of water systems and other stakeholders. The purpose of the meetings was to discuss and support the formation of a coalition of water purveyors and other stakeholders for locally driven recommendations needed for addressing groundwater supply and monitoring issues. A coalition was identified as one way that water systems could effectively voice their concerns to state and federal policy makers in order to bring in resources to address the problem. Agricultural demands on the groundwater far exceed those of the water purveyors, and there is not much water systems can do to change that demand. Forming partnerships and bringing in outside resources are crucial to finding a solution.

The Columbia Basin Sustainable Groundwater Coalition was formed in these meetings. The work from this group is expected to influence and inform decision makers so that they may create policies and direct resources for long-term groundwater solutions. The Coalition has already developed a problem statement, vision, and mission statement, and has identified short-term and long-term priorities.

RECOMMENDATIONS

Water System Water Level Data Reporting and Repository

O Develop an online reporting system for water systems to report their required seasonal well level measurements

Long-term Monitoring

- O Three alternative approaches for a well-monitoring network have been outlined during this effort
- Select and support one of the long-term monitoring network alternatives
- Support collaboration on the USBR Applied Science Grant to assist in funding an expanded monitoring network

Support for the Columbia Basin Sustainable Groundwater Coalition

- Organizational support/ meeting facilitation
- O Representation by Office of Drinking Water at future meetings
- Grant-writing support for the US Bureau of Reclamation WaterSMART Cooperative Watershed Management Program Grant: Phase 1
- Grant-writing support for future grants

Local, State, and Federal Agency Coordination

Establish an interagency working group between the Department of Health, Department of Ecology, Department of Agriculture, and Department of Commerce specific to this groundwater depletion issue. Utilize existing knowledge and agency staff familiar with this issue. Other groups that could be included are the US Bureau of Reclamation, the Washington State Water Research Center at Washington State University, the Washington State Conservation Commission, counties, local conservation districts, and local health jurisdictions.

Regionalization

- O Funding to support water system consolidation projects, such as in the Othello area
- Continue to support regionalization efforts in Lincoln County
- Support for the Columbia Basin Sustainable Groundwater Coalition (see above)

Chapter 1: Introduction

Background

Declining Groundwater in the Columbia Basin

The Department of Health (DOH), Office of Drinking Water formed a partnership in 2017 with the Department of Commerce, Small Communities Initiative (SCI) to work with water systems on groundwater depletion in the Mid-Columbia Basin (Adams, Franklin, Grant, and Lincoln counties). This project was to build upon previous outreach work DOH had conducted that included a meeting of basin municipalities in Moses Lake on January 9, 2014, and technical assistance outreach to over 110 Group A - Community water systems through Evergreen Rural Water of Washington in 2015 and 2016. The DOH Strategy for Ensuring Reliable Long-Term Municipal Water Supplies in the Columbia Basin (Appendix E) identified a goal and vision for outreach efforts:

Vision: Consistent with our mission to ensure reliable water supplies, we are committed to providing planning assistance to municipalities affected by declining groundwater supplies in the Columbia Basin supplies now and for the long-term.

Goal: To help municipalities that are facing water supply challenges, plan for a more reliable future water supply.

DOH directed this project to go beyond just the municipalities. Commerce reached out to 137 Group A – Community water systems in the four-county area that rely on groundwater sources for their drinking water, and together serve about 92,000 residents.

Geology of the Aquifers

The groundwater in the Mid-Columbia basin resides in a complex system of aquifers. The two main sources of water are the Wanapum and Grande Ronde aquifers. The aquifers are confined within layers of basalt that separate them from one another. The Grande Ronde is the deepest and most extensive in terms of area. On top of that is the Wanapum. The most shallow is the Saddle Mountains aquifer that sits above both the Wanapum and Grande Ronde. Above all of these is what is referred to as the overburden. This is where rain and surface water can percolate into the ground and is contained by the shallowest of the basalt confining layers. Figure 1 shows the four counties in relation to the aquifers, and the relative locations of the water system wells associated the 137 Group A - Community systems that were included in this projects outreach efforts. Figure 2 provides a cross section of the aquifer layers and the relative flow of water. It should be noted that the aquifers are shallower in Lincoln County and get deeper as you move to the south and west towards the center of the Grande Ronde.



Aquifers in Adams, Franklin, Grant, and Lincoln Counties

Figure 1. Aquifers of the Columbia Basin



FIGURE 21.-Generalized ground-water-flow pattern in the Columbia Plateau aquifer system.

Figure 2. Aquifer Cross Section - Source: USGS PP1413b

Aquifer Demand

Previous studies by the Columbia Basin Groundwater Management Area (GWMA) showed that the majority of the groundwater demand comes from agricultural irrigation. The demands have caused the water table to drop significantly in some areas. This issue is particularly acute in the Odessa Subarea. Another contributing factor is that much of the aquifers in the basin do not readily recharge because of the complex geology. The GWMA conducted a carbon dating study of the water from 77 municipal wells and found, on average, the water was 9,200 years old with little to no recharge of the aquifers occurring.

The majority of the agricultural wells, whose water rights date back to the 1960s, were never meant to be permanent. They were a stopgap until the United States Bureau of Reclamation's Columbia Basin Project (CBP) was completed. However, build out of the project stalled in the 1970s due to funding and later, endangered species issues. Instead of phasing out groundwater usage as planned, pumping of the aquifers has been increasing for almost 50 years, resulting in groundwater declines of over 200 feet in some areas. Water systems have felt the effects. Some have had to lower their pumps to chase the water down their wells. Others are looking at switching to shallow sources, which require costly treatment systems because they have found the shallow groundwater has contaminants that will need to be removed. Others still are looking at using CBP water to treat and inject using aquifer storage and recovery. Not all groundwater is ideal for drinking water use. Both shallow and deep sources can encounter contaminants that make the water unsuitable or require the additional costs of water treatment facilities. Both of these contaminant challenges occur in the basin, from manmade

chemicals and nitrates in shallow water, to brackish and hot water from deep wells. There exists a requirement in WAC 246-290-130(1) that states, "Every purveyor shall obtain drinking water from the highest quality source feasible." Some of the systems that are able to explore alternative sources are doing so out of necessity. Unfortunately, not all of the systems impacted have clear alternative sources of water.

Water rights in Washington State are first in time, first in right, which means that older water rights are deemed senior and shall not be impaired by junior rights. Many of the water systems in the area were established prior to the issuance of the agricultural groundwater irrigation rights. However, it can be difficult to prove impairment by a junior user when it comes to groundwater. Not only that, we have found it to be unpopular in this area because of the relationships between the cities and towns, the farmers, and the economy. People are also aware that legal solutions do take a long time and a lot of money. The Yakima Basin adjudication has taken over 40 years, and that only deals with surface water rights, which are arguably simpler to resolve. We found that people are more interested in working together to solve the problem, than to explore water rights and legal solutions. That may change if the situation worsens. There is an Ecology rule for the Odessa Subarea made specifically for addressing declines in the aquifer in that area. That rule is WAC 173-130A, but staff at Ecology had no knowledge of it ever being utilized to address this issue.

The water systems dealing with groundwater decline are facing a serious long-term challenge. They are in an area where water is being withdrawn much faster than it can be replaced, they have little control over the demand placed on the aquifers, the cities and towns are economically linked to the farmers using the groundwater, and there is a lack of data for water systems to use for decision-making purposes. The information we gathered suggests that many water systems do not know if or how their wells are being affected.

Water Systems Included in the Outreach Effort

Water System Selection

Commerce made the decision to include in the outreach effort all the Group A - Community water systems in the four county area that were reliant upon ground water. This resulted in a list of 137 water systems. The notable exception was the City of Pasco, as their main water source is surface water from the Columbia River. The entire list of water systems is included in Appendix H.

Project Efforts

Outreach

In 2018, Commerce began conducting outreach to water systems in the basin as part of the partnership with HEALTH. Commerce conducted a survey of the systems, analyzed existing data, facilitated outreach meetings, and hosted a stakeholder meeting on long-term monitoring.

In 2019, efforts transitioned to support the formation of a coalition of water systems so that they can continue to advocate for solutions to protect the remaining groundwater. One of the objectives of this group is to advocate for funding at the state and federal level to support transitioning farmers using

groundwater to sustainable surface water sources. Education is needed around water usage, groundwater monitoring such as a regionalized monitoring program that would provide important data for local decision making and understanding the aquifer at the regional scale, and projects that reduce the demand on groundwater or actively recharge the aquifers. Commerce worked with the US Geological Survey, US Bureau of Reclamation, WA Department of Ecology, Washington State University, and many others through the course of this project to try to include the right people in the conversation.

A Need for Advocacy

There is an opportunity for water systems to advocate for themselves around this issue. By getting the attention of policy makers and bringing state and federal resources to the table, work can be done to increase localized knowledge about the aquifers, and secure additional project funding to transition agricultural irrigators onto surface water to slow the rate of aquifer decline. This includes fully funding the Odessa Groundwater Replacement Program (OGWRP) and bridging the financial gap to connect farmers to the water. A longer-term objective will be building the East High Canal, a project that local farmers have been waiting on for 50 years to supply surface water for irrigation as part of the Columbia Basin Project (CBP). There are many farmers who are waiting for this water, but do not know if it will arrive before their wells fail.

Starting In March 2019, Commerce began a series of five facilitated meetings to support forming a coalition of water systems and other stakeholders. A coalition was identified as one way that water systems could effectively voice their concerns to state and federal policy makers in order to bring in resources to address the problem. Agricultural demands on the groundwater far exceed those of the purveyors, and there is not much water systems can do to change that demand. Forming partnerships and bringing in outside resources are crucial to finding a solution.

Chapter 2: Data

Existing Water Level Data

One of the objectives of the project was to seek out and analyze existing groundwater data pertaining to water systems. It was discovered that there was not a good source of data. This is covered in depth in the following section. While some of the water systems do collect depth to water data for their wells, there is no repository for this information. The survey results indicated that 28 of the 53 respondents to that question were collecting depth to water data on their wells. However, when asked to share that data, only five water systems provided it. Of those five, only two had enough history to provide any trends.

Because of the lack of available water system data, we sought out other sources of groundwater information. The best sources of information are the Department of Ecology, the US Geological Survey, U.S. Bureau of Reclamation, and the Columbia Basin GWMA.

The majority of the data related to the area of interest shows water level declines. The problem with most of the data is that it is not very useful for knowing what is going on in a specific water system well. Ecology does the majority of the ongoing data collection, however they only have recent data for one water system well in the four county area. Most of the wells are irrigation or monitoring wells. The one municipal well is City of Davenport's Well #2, which is an inactive well. That well data indicates water levels are staying stable, but the City has reported declines in their active Well #7. This goes to highlight the complexity of the geology in even this small area.

USGS Analysis of Wanapum and Grande Ronde

The U.S. Geological Survey has studied the change in groundwater levels in both the Wanapum and Grande Ronde aquifers. A 2010 study (1) analyzed groundwater levels between 1984 and 2009 and found declines in 83 percent of the 470 wells that were measured. The amount of decline was highly variable averaging two feet per year in the Grande Ronde. However, one well in Adams County was found to have declined more than 200 feet. Figures 3 and 4 show the results of the well mapping for the Wanapum and Grande Ronde respectively. As can been seen, there is relatively little data in the Wanapum. The Grande Ronde is better represented, and the majority of wells show significant declines. A 2015 paper (2) published by the USGS modeled the decline expected in the Wanapum between 2007 and 2050, and it predicts another 1 to 50 foot decline in addition to what has already occurred.

¹ Snyder, D.T., and Haynes, J.V., (2010), Groundwater conditions during 2009 and changes in groundwater levels from 1984 to 2009, Columbia Plateau Regional Aquifer System, Washington, Oregon, and Idaho: U.S. Geological Survey Scientific Investigations Report 2010–5040, 12 p.

² Vaccaro, J.J., Kahle, S.C., Ely, D.M., Burns, E.R., Snyder, D.T., Haynes, J.V., Olsen, T.D., Welch, W.B., and Morgan, D.S., (2015), *Groundwater availability of the Columbia Plateau Regional Aquifer System, Washington, Oregon, and Idaho: U.S. Geological Survey Professional Paper 1817*, 87 p., http://dx.doi.org/10.3133/pp1817.



Figure 3. Wanapum Groundwater Change - Source: USGS SIR 2010-5040, Plate 8 of 9



Figure 4. Grande Ronde Groundwater Change - Source: USGS SIR 2010-5040, Plate 9 of 9

Other Studies

The U.S. Bureau of Reclamation and the Department of Ecology looked at decline in the Odessa Subarea Special Study (3), and found that wells in the area had declined as much as 200 feet. The GWMA study also found widespread decline in the area. The most recent study reviewed was the "Water Level Assessment for the Lincoln County Sustainable Water Supply Study" (4) commissioned by the Lincoln County Conservation District as part of their ongoing groundwater study funded by the Department of Ecology, Office of Columbia River. All of these studies identify groundwater decline in the area.

Analysis of Water System Level Data

As the project team began collecting data, we identified multiple gaps that inhibited in-depth analysis.

To properly evaluate the health and sustainability of the 137 water systems, the following information should be collected: time series data, consistent measurement and recording standards, well data relevant to validate measurements, location data for each well, determination of which wells draw from which aquifers or the overburden, and water level data on all impacted aquifers.

<u>Current time series data is lacking.</u> In the data provided wells have between one and three data points. These data points include an initial static water level measurement taken upon commissioning of the well and up to two measurements from 2016. Wells are currently measured either once per year prior to the beginning of the irrigation season (around May), or twice per year before irrigation (May) and after irrigation (November). Unfortunately, this data is not readily available. Having time series data recorded and available would enable an assessment of well and aquifer health.

There is not enough available data about each of the wells to convert properly between disparate measuring and recording standards. Although the project team did have access to initial well depths and initial assessments of water level per well, recording styles vary between wells and between measurements of the same well. In different instances a well may be measured with a water level calculated using "measuring point distance to water (MP-DTW)," "Land surface datum distance to water (LSD-DTW)," or "water level, distance above pump." Each of these measurements is reported in similar units, but the measurements are not identical. Having a unified recording standard would facilitate analysis, and greatly decrease the risk of errors. It is important to note that "measuring point distance above pump" measurements have an inverse relationship, a low number for MP-DTW indicates a high water level, where as a low number for "distance above pump" indicates a low water level, confusing these two would severely affect an analysis. The project team was unable to convert between MP-DTW, LSD-DTW, and distance above pump measurements due to inconsistent measures regarding well depths, measuring point height, and airline length.

<u>Aquifer data is lacking.</u> The United States Geological Survey (USGS) provides water level data on two of the impacted aquifers (Wanapum Basalt and Grande Ronde), but does not have data for the Saddle

³ USBR, (2012), Final Feasibility-Level Special Study Report Odessa Subarea Special Study Columbia Basin Project, Washington, https://www.usbr.gov/pn/programs/eis/odessa/finaleis/final.pdf.

⁴ Lindsey, K., Travis, J., Newman, P., and Candelaria, A., (2018), *Lincoln County Conservation District Water Level Assessment for the Lincoln County Sustainable Water Supply Study*. <u>https://docs.wixstatic.com/ugd/bb8ec7_bbc976a9d07b4e55a9df2bb6ef74eca3.pdf</u>.

Mountain aquifer. The two aquifers monitored only provide data from a single measuring point for each aquifer. Data on all affected aquifers and from more than a single measuring point would give a clearer picture of overall aquifer and water system health and sustainability.

Another challenge is understanding the depths of the three aquifers specifically in the four counties. We digitized USGS maps (5) of the Grande Ronde, Wanapum, and Saddle Mountain aquifers to create geographic information system (GIS) layers of the aquifers and their water level contour lines. The goal was to understand which wells draw from which aquifers. However, the contour lines on each map appear to represent only the water level recorded in wells at those particular locations. These maps do not include information to determine the depth of each aquifer in areas where aquifers are positioned on top of one another.

We then referred to the Columbia Basin Ground Water Management Area (GWMA) report, Subsurface Mapping and Aquifer Assessment Project (6), to identify the aquifers depth levels. This study developed a cross-sectional model of the aquifer system within the Columbia Plateau Aquifer System. A three-dimensional model developed by the USGS (7) was also referenced. These models suggest the overburden is non-existent in some sections of the four counties. In those cross-sections where the overburden is identifiable, it ranges from sea level to 2,000 feet above sea level. The Grande Ronde Basalt ranges from 16,000 feet below sea level to 6,000 feet above sea level. The Wanapum Basalt ranges from 2,000 feet below sea level to 6,000 feet above sea level. The Saddle Mountain Basalt ranges from 500 feet below sea level to 3,000 feet above sea level. Unfortunately, the variance is too high in these models to determine reliably the depth of a particular aquifer at a particular point on a map. Therefore, we were unable to determine which wells are drawing from an aquifer or the overburden (8, 9, 10)

8 GWMA. (2009). Subsurface Mapping and Aquifer Assessment Project. Figure 13 B.

This cross-section covers Douglas, Grant and Benton Counties: Overburden ranges from sea level to 1,000 feet above sea level. Grande Ronde Basalt ranges from -16,000 feet below sea level to 4,250 feet above sea level. Wanapum Basalt ranges from -2,000 feet below sea level to 4,000 feet above sea level. Saddle Mountain Basalt ranges from -500 feet below sea level to 3,000 feet above sea level.

9 GWMA. (2009). Subsurface Mapping and Aquifer Assessment Project. Figure 13 C.

10 GWMA. (2009). Subsurface Mapping and Aquifer Assessment Project. Figure 13 F.

⁵ USGS. (2010). Combined Thickness of the Modeled Wanapum Basalt and Vantage-Latah Interbed Geomodel Units (wnthk>f). https://water.usgs.gov/GIS/metadata/usgswrd/XML/sir2010-5246_wnthk_f.xml

⁶ GWMA. (2009). *Subsurface Mapping and Aquifer Assessment Project*. Figure 13, maps B, C and F. Pages 34-38. <u>https://fortress.wa.gov/ecy/publications/publications/1203262.pdf</u>

⁷ USGS. (2011). Three-Dimension Model of the Geologic Framework for the Columbia Plateau Regional Aquifer System, Idaho, Oregon, and Washington. <u>https://pubs.usgs.gov/sir/2010/5246/pdf/sir20105246.pdf</u>

This cross-section covers Grant, Adams and Whitman Counties: No identifiable overburden in this cross-section. Grande Ronde Basalt ranges from -9,000 feet below sea level to 5,000 feet above sea level. Wanapum Basalt ranges from -500 feet below sea level to 3,000 feet above sea level. Saddle Mountain Basalt ranges from 1,500 to 3,000 feet above sea level.

This cross-section covers Kittitas, Grant, Lincoln and Spokane Counties: The overburden maintains a consistency around 2,000 feet above sea level in this cross-section. Grande Ronde Basalt ranges from -4,000 feet below sea level to 6,000 feet above sea level. Wanapum Basalt ranges from 1,000 to 2,000 feet above sea level. The Saddle Mountain Basalt maintains a consistency around 1,000 feet above sea level in this cross-section.

The project team encountered 34 instances in which the latitudinal and longitudinal coordinates of a particular well is unknown and is not listed in DOH Sentry and Ecology EIM databases. Therefore, the locations of these 34 wells were estimated using section-township-range (STR) information (11). The wells were mapped using ArcGIS. An initial goal of this map was to use interpolation to fill in data gaps using known information from the water systems survey (12), previously known data and irrigation well data. We had planned to estimate the unknown data through ArcGIS statistical analysis tools, such as "Kriging." Unfortunately, the limited number of data points available precluded statistically valid or reliable results. While there are no hard and firm rules on the number of data points required, (13) the minimum number of data points required to achieve a reasonably reliable result is between 30-40 data points. Only five validated data points are currently available and thus no interpolation was possible.

Four of the data points available are well locations, initial well depths per well, initial assessments of water level per well and one or two follow-up assessments of water levels per well. Additionally, the project team used the water systems survey results to identify wells with reported problems, shortages, and/or concerns about shortages within the next five to 15 years. Approximately 68 percent of the water systems surveyed responded. The project team considered using the survey results to estimate the likelihood of non-responding water systems to have issues or concerns with wells, but the wells were not clustered near enough for reliable analysis.

The project team then considered using irrigation well data. The project team collected irrigation well locations and depths from the Department of Ecology via a public records request. Ecology responded to the request with a spreadsheet of irrigation well locations and attributes. Three categories of irrigation wells are included in the spreadsheet: agricultural irrigation, individual irrigation and unknown irrigation. Unfortunately, the irrigation wells were at much greater depths than the water system wells. Therefore, it cannot be determined with current information whether the water sources drawn from both well types overlap.

¹¹ The section-township-range information was available from the Department of Health Sentry database. Each STR is one square mile. The coordinates of the center point of each STR were used to approximate the locations for each well.

¹² Please refer to Appendix C for a copy of the survey questions.

¹³ The number of data points vary based upon study area size and the range of variability across the data.

Water System Data Requests

Water systems were contacted and asked to share their well monitoring data if they had responded to the 2018 survey indicating that they collected data, and would be willing to share it. Four water systems submitted data for review. Only two of the water systems provided enough historical data for any trends to be gleaned regarding groundwater levels. The water systems that provided information were:

Water System Name	Water System ID	County	Comment
LIND, TOWN OF	47350	ADAMS	Data shows a concerning trend of declining groundwater.
SAGE HILLS SECOND WATER SYSTEM	04398	GRANT	Data indicated that groundwater levels were stable. This is not unexpected for water systems with shallow wells in the irrigated portion of the Columbia Basin Project.
DAVENPORT WATER DIVISION	18100	LINCOLN	Levels for 2018 were provided. There was not enough historical data to determine a trend.
SUNNYHILLS	23391	LINCOLN	Data came from the Lincoln County Conservation District groundwater- monitoring project. There was not enough historical data to determine a trend.

The data is included in Appendix F.

Chapter 3: Water System Information

Categorization of Water Systems by Survey Response

The Department of Commerce sent a survey to 137 Group A - Community water systems in February 2018. Commerce received 57 responses to the survey. Because some of the operators that completed the survey operate multiple systems, this provided for a good overall representation of the water systems. The water system response rate was 68 percent, with 93 of the systems represented. Several of the survey respondents operate multiple water systems and did not specify for which system they were reporting. If they reported an issue or concern, it was applied to all their systems unless they indicated the specific system. Additional survey results are included in Appendix C.

Water System Name	Water System ID	County	Comment
LIND, TOWN OF	47350	ADAMS	Considering water rationing. The Town is concerned about the lowering water table and entrained air. The Town has lowered the pump set at Well #7 by 100 feet. Well #7 shows signs of breaking during the summer. Well #8 drawdown continues to lower and recovery takes longer.
MEADOW LANE WATER ASSN	53190	ADAMS	Reported not having a planning document.
OTHELLO WATER DEPARTMENT	64850	ADAMS	
RITZVILLE WATER DEPARTMENT	72700	ADAMS	Losing around 2 feet per year. The city has drilled a new well, but it is having pumping issues. The main pump has been pulled due to declining water levels.
RINGOLD DOMESTIC WATER CORP	72500	FRANKLIN	Low water levels in wells.
SUNRISE ESTATES WATER SYSTEM	13451	FRANKLIN	Reported not having a planning document.
MOSES LAKE, CITY OF	56300	GRANT	We implemented water restrictions for the summer of 2017, and plan to keep that in place for the near future. We have drilled two shallow wells that we plan to have online by the end of 2018 and we will continue to make several capital improvements to the system over the

Survey Question 2 - Water Systems Reporting Well Decline or Failure

			next few years to improve our ability to serve Moses Lake.
NORTH SHORE ACRES	03370	GRANT	
ROYAL CITY WATER	74700	GRANT	Well failure due to mechanical failures caused by sand intrusion.
ROYAL WATER DISTRICT	00543	GRANT	Well ran dry in 2016.
WARDEN, CITY OF	92850	GRANT	
DAVENPORT WATER DIVISION	18100	LINCOLN	Well #7 has a declining water level.
ODESSA	63050	LINCOLN	Static level on well #3 has decreased 2.7 feet in three years. We run well #4 more to offset.

Survey Question 3 - Water Systems Unable to Meet Year Round Demand without Restrictions

Water System Name	Water System ID	County
LIND, TOWN OF	47350	ADAMS
BASIN CITY WATER SEWER DISTRICT	04461	FRANKLIN
NORTH SLOPE ESTATES PROPERTY	10761	FRANKLIN
MOSES LAKE, CITY OF	56300	GRANT
SUNNYHILLS	23391	LINCOLN

Survey Question 4 - Water Systems with Concerns about Meeting Demand in the Next 5-15 Years

Water System Name	Water System ID	County
LIND, TOWN OF	47350	ADAMS
SADDLE MOUNTAIN WATER ASSOCIATION	75200	ADAMS
WARDEN HUTTERIAN BRETHREN 1	92829	ADAMS
BASIN CITY WATER SEWER DISTRICT	04461	FRANKLIN
CONNELL, CITY OF	14600	FRANKLIN
KAHLOTUS, CITY OF	37400	FRANKLIN
NORTH SLOPE ESTATES PROPERTY	10761	FRANKLIN
RINGOLD DOMESTIC WATER	72500	FRANKLIN
SUNSET DOMESTIC WATER ASSN	86100	FRANKLIN
CRESCENT VIEW CONDOMINIUM OWNERS	03129	GRANT
DESERT AIRE OWNER ASSOCIATION	19056	GRANT
EPHRATA WATER DEPARTMENT	23650	GRANT
GEORGE, CITY OF	27395	GRANT
GOLDEN VALLEY WATER ASSOCIATION	28400	GRANT
GROVE TERRANCE MHP TWO, LLC	08520	GRANT
LAKEVIEW PARK WATER ASSN	45350	GRANT
QUINCY VALLEY ADULT PARK	01639	GRANT
ROYAL CITY WATER	74700	GRANT
ROYAL WATER DISTRICT	00543	GRANT
SAGE HILLS ESTATES 1	01371	GRANT
SAGE HILLS SECOND WATER SYSTEM	04398	GRANT
SOAP LAKE WATER DEPT	81300	GRANT

SUNSERRA AT CRESCENT BAR	AA745	GRANT
WANAPUM VILLAGE	29082	GRANT
WARDEN, CITY OF	92850	GRANT
WESTMONT ACRES	95240	GRANT
ALMIRA WATER SYSTEM	01700	LINCOLN
DAVENPORT WATER DIVISION	18100	LINCOLN
EDWALL WATER ASSOCIATION	22550	LINCOLN
HANSON HARBOR HOMEOWNERS ASSOC.	19928	LINCOLN
REARDAN, TOWN OF	71550	LINCOLN
ROOSEVELT LAKE RANCH WATER SYSTEM, INC.	47283	LINCOLN
SPRAGUE, CITY OF	83150	LINCOLN
SUNNYHILLS	23391	LINCOLN
WILBUR, TOWN OF	96800	LINCOLN

Water Systems with a Planning Document

The following tables include water systems that have been verified as having a planning document, either through an inventory of Department of Health, Office of Drinking Water, Eastern Regional Office (ERO) plan shelves or through the 2018 survey. The purpose of this list was to try to determine which water systems have produced, or are producing, planning documents designed to respond to water supply challenges, such as water shortage response programs, water use efficiency programs, water supply plans, and comprehensive plans.

The survey did not distinguish between a water system plan (WSP) and a small water system management program (SWSMP) because emergency response plans (which include water shortage response programs) and water use efficiency programs are required elements of both Water System Plans (WSPs) and Small Water System Management Programs (SWSMPs). These lists contain some Group B, Group A - TNC, and Group A - NTNC systems that had plans on the shelf in the ERO, but were not included in the outreach effort. The systems are alphabetical by county.

Water System NameWater System IDBRUCE WATER SYSTEM09540GOLDEN PLAINS MHP #189060HATTON, TOWN OF31600HI LO HOMEOWNERS ASSN85203HIGHLAND ESTATES WATER SYSTEM32736LIND, TOWN OF47350OTHELLO WATER DEPARTMENT64850RADAR MOBILE HOME PARK70690RAINIER TRACTS WATER ASSN (WHPP)70910RITZVILLE WATER DEPARTMENT72700SADDLE MOUNTAIN WATER ASSOC75200SECT 11 DIV 1 RIDGEVIEW WATER ASSN72410SPORTSMAN TRAILER PARK83116SUNSET ACRES WATER ASSOCIATION85950WARDEN HUTTERIAN BRETHREN 192829WASHTUCNA WATER DEPARTMENT93450	Adams County	
BRUCE WATER SYSTEM09540GOLDEN PLAINS MHP #189060HATTON, TOWN OF31600HI LO HOMEOWNERS ASSN85203HIGHLAND ESTATES WATER SYSTEM32736LIND, TOWN OF47350OTHELLO WATER DEPARTMENT64850RADAR MOBILE HOME PARK70690RAINIER TRACTS WATER ASSN (WHPP)70910RITZVILLE WATER DEPARTMENT72700SADDLE MOUNTAIN WATER ASSOC75200SECT 11 DIV 1 RIDGEVIEW WATER ASSN72410SPORTSMAN TRAILER PARK83116SUNSET ACRES WATER ASSOCIATION85950WARDEN HUTTERIAN BRETHREN 192829WASHTUCNA WATER DEPARTMENT93450	Water System Name	Water System ID
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HI LO HOMEOWNERS ASSN85203HIGHLAND ESTATES WATER SYSTEM32736LIND, TOWN OF47350OTHELLO WATER DEPARTMENT64850RADAR MOBILE HOME PARK70690RAINIER TRACTS WATER ASSN (WHPP)70910RITZVILLE WATER DEPARTMENT72700SADDLE MOUNTAIN WATER ASSOC75200SECT 11 DIV 1 RIDGEVIEW WATER ASSN72410SPORTSMAN TRAILER PARK83116SUNSET ACRES WATER ASSOCIATION85950WARDEN HUTTERIAN BRETHREN 192829WASHTUCNA WATER DEPARTMENT93450	HATTON, TOWN OF	31600
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SADDLE MOUNTAIN WATER ASSOC75200SECT 11 DIV 1 RIDGEVIEW WATER ASSN72410SPORTSMAN TRAILER PARK83116SUNSET ACRES WATER ASSOCIATION85950WARDEN HUTTERIAN BRETHREN 192829WASHTUCNA WATER DEPARTMENT93450	RITZVILLE WATER DEPARTMENT	72700
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SUNSET ACRES WATER ASSOCIATION85950WARDEN HUTTERIAN BRETHREN 192829WASHTUCNA WATER DEPARTMENT93450	SPORTSMAN TRAILER PARK	83116
WARDEN HUTTERIAN BRETHREN 192829WASHTUCNA WATER DEPARTMENT93450	SUNSET ACRES WATER ASSOCIATION	85950
WASHTUCNA WATER DEPARTMENT 93450	WARDEN HUTTERIAN BRETHREN 1	92829
	WASHTUCNA WATER DEPARTMENT	93450

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Water System Name	Water System ID
BASIN CITY WATER SEWER DISTRICT	04461
CLEARWATER DOMESTIC WATER ASSN	13550
CONNELL, CITY OF	14600
CYPRESS COUNTRY ESTATES	15461
CLARK ADDITION WATER SYSTEM	AB809
EDWIN MARKHAM	AD282
ELTOPIA WATER ASSOCIATION	23240
KAHLOTUS, CITY OF	37400
KEPPS ACRES ASSOCIATION	17189
MESA WATER DEPARTMENT	54100
NORTH SLOPE ESTATES PROPERTY	10761
PASCO WATER DEPARTMENT	66400
RINGOLD DOMESTIC WATER CORP	72500
SUNSET DOMESTIC WATER ASSN	86100

WEST MESA DOMESTIC WATER ASSN	94830

Grant County

Water System Name	Water System ID
BASIN WATER SOURCES INC	04600
BLUE LAKE SUMMER HOMES WATER ASSN	07504
DESERT VILLA	19068
CASCADE VALLEY WATER DISTRICT	11500
CAVE B WINERY	AB184
CASCADE VILLAGE MHP	11488
COUGAR CAMPERS	AB548
COULEE CITY, TOWN OF	15300
COUNTRY CLUB ESTATES WATER SYSTEM	18189
COUNTRY CORNER MOBILE HOME PARK	06456
CRESCENT BAR SYSTEM	15950
CRESCENT BAY RESORT	AB358
CRESCENT VIEW CONDOMINIUM OWNERS	03129
DESERT AIRE OWNER ASSN	19056
DESERT HILLS	AC131
DIAMOND POINT WATER SYSTEM	06536
ELDORADO STONE	AB699
ELECTRIC CITY, CITY OF	22850
EPHRATA WATER DEPARTMENT	23650
FLYING J TRAVEL PLACE	AB909
FORDAIR WATER CO-OP INC	25800
GEORGE, CITY OF	27395
GRAND COULEE WATER DEPT, CITY OF	28700
GRANT PUD - PRIEST RAPIDS FISHERIES BUILDING	29079
GRANT PUD - WANAPUM INDIAN VILLAGE	29075
GRANT PUD - WANAPUM MAINTENANCE CENTER	29078
GRANT PUD - WANAPUM POWERPLANT	29080
GROVE TERRACE MHP TWO, LLC	08520
HARTLINE WATER SYSTEM (SWSMP)	31500
HILLCREST WATER USERS ASSN (SWSMP)	33200
LAKEVIEW MOBILE TERRACE	45312
LAKEVIEW PARK WATER ASSN	45350
LEGACY WATER LLC	AB961
MATTAWA, CITY OF	52000
MOSES LAKE, CITY OF	56300
MT VIEW WATER SYSTEM	57000
NORTH SHORE ACRES	03370
OUTLAW CAMP	AC008
PANORAMA HEIGHTS	08043
PARKER SPRING ACRES WATER ASSOC	22881
PELICAN POINT WATER COMPANY	66800
PONDEROSA MOBILE HOME PARK	68420
QUAIL RUN MOBILE HOME PARK (SWSMP)	39424
QUINCY WATER DEPARTMENT, CITY OF	70450
R & P RENTALS	68437
RIDGEVIEW ESTATES WATER ASSOCIATION	03912
ROYAL CITY WATER	74700
ROYAL WATER DISTRICT (SWSMP)	00543

SAGE HILLS ESTATES 1	01371
SAGE HILLS SECOND WATER SYSTEM (SWSMP)	04398
SANDY POINT MOBILE HOME PARK	39346
SENTINEL GAP WATER ASSN	76620
SILVER SANDS CONDO WATER	02345
SKYLINE WATER SYSTEM INC	80210
SOAP LAKE WATER DEPT	81300
STRATFORD ROAD ESTATES	07542
SUN DESERT INC	19936
SUN LAKES STATE PARK (SWSMP)	SP920
SUNLAND ESTATES HOMEOWNERS ASSN (SWSMP)	85240
SUNSERRA AT CRESCENT BAR	AA745
W&L ORCHARDS	AB465
WANAPUM VILLAGE	29082
WARDEN, CITY OF	92850
WESTMONT ACRES	95240
WESTSHORE WATER COMPANY	56143
WILSON CREEK WATER DEPT, TOWN OF (SWSMP)	97400

Lincoln County

Water System Name	Water System ID
ALMIRA WATER SYSTEM	01700
COLUMBIA SPRINGS ESTATES	04298
CRESTON PUBLIC WATER	16150
DAVENPORT WATER DIVISION	18100
DEER MEADOWS WATER COMPANY INC	01852
EDWALL WATER ASSN	22550
HANSON HARBOR HOMEOWNERS ASSN (SWSMP)	19928
LAKEVIEW SUBDIVISION	19906
ODESSA	63050
REARDAN, TOWN OF (SWSMP)	71550
RIDGEVIEW WATER SYSTEM	AC016
ROOSEVELT LAKE RANCH (SWSMP)	47283
ROOSEVELT VIEWS SUBDIVISION	AA482
SEVEN BAYS ESTATES UNLIMITED (SWSMP)	77651
SPRAGUE, CITY OF	83150
SUNNYHILLS	23391
WILBUR, TOWN OF	96800

Water Systems without Planning Documents - Survey Results

The following 14 water systems indicated in their survey responses that they did not have a planning document. These water systems should be prioritized for technical assistance outreach.

Note: The ten water systems marked with an asterisk (*) were completed by a single contract operator and it cannot be determined from the response which systems are without plans. Also note that four water systems on this list do have a plan on the shelf at the DOH Eastern Regional Office even though they said they did not have one in the survey.

Water System Name	Water System ID	County	Plan Available at ERO	Reported Well Issue
MEADOW LANE WATER ASSN	53190	ADAMS		YES
SUNSET ACRES WATER ASSN *	85950	ADAMS		
SUNLAND ESTATES HOMEOWNERS ASSN *	85240	FRANKLIN		
SUNRISE ESTATES WATER SYSTEM *	13451	FRANKLIN		YES
DESERT VILLA	19068	GRANT	YES	
FIRST POTHOLES WATER USERS ASSN *	25250	GRANT		
MARINE VIEW HOME OWNERS ASSN *	51724	GRANT		
ORCHARD HOMES WS *	64080	GRANT		
PAINTED HILLS WATER ASSOCIATION *	65640	GRANT		
PARKER SPRING ACRES WATER ASSOC *	22881	GRANT	YES	
PELICAN POINT WATER CO *	66800	GRANT	YES	
SKYLINE ACRES INC *	80200	GRANT		
SUNRISE WATER ASSOCIATION	16177	GRANT		
WILSON CREEK WATER DEPT, TOWN OF	97400	GRANT	YES	



Well Concern Status and Depth

Figure 5. This map depicts the location of wells in the basin and the depth and issues/concerns identified in the survey.

Chapter 4: Outreach Efforts

Outreach Meetings

Water System Meetings

In the summer of 2018, Commerce organized outreach meetings in each of the four counties. The purpose of the meetings was to: provide information to the water systems about groundwater conditions based on existing data; talk about well monitoring requirements and why regular measurements are important; report out of the results of the February 2018 survey; and to explore ideas about what could be done to address groundwater decline. The organizer of the Lincoln County Mayors' Meeting requested an additional presentation, which brought the total to five. The meeting dates and attendance numbers are as follows (Commerce staff was excluded from these numbers):

O Lincoln County, Davenport; June 14, 2018 - 14 attendees

There was a good amount of discussion and commitment to stay involved going forward. The people in Lincoln County acknowledge there is a problem. They want 'something' to be done.

O Grant County, Ephrata; June 19, 2018 - 20 attendees

Good interest from people to stay involved. Offer from Conservation District to help facilitate future efforts.

O Adams County, Othello; July 10, 2018 - 18 attendees

There was a good amount of discussion and commitment to stay involved going forward. Water systems in Adams County are being impacted by declining water levels. The Town of Lind reported having to lower their pumps as they are losing 3 ft/yr in one well and 5 ft/yr in another.

There was considerable discussion regarding consolidation of existing systems around Othello.

O Franklin County, Pasco; July 16, 2018 - 12 attendees

The Franklin County meeting was somewhat different from the previous three. Franklin County has the fewest cities and towns utilizing groundwater and as such had the lowest turnout. The operator for Connell and Kahlotus said they had not detected any declines in their wells, but they had not been monitoring for very long.

O Lincoln County Mayors, Davenport; July 20, 2018 - 12 attendees

The two meetings in Lincoln County encompassed the majority of the county's water systems.

The total attendance for all five meetings was 76 people. Attendees represented water systems, conservation districts, local health jurisdictions, counties, universities, and state and federal agencies. Sign in sheets, agendas, and presentations can be found in Appendix D.

Ben Serr also presented to the board of the Columbia Basin Development League on September 11, 2018, regarding the Mid-Columbia Project efforts. The presentation was well received and Washington State Representative Mary Dye, who was working to find funding for the Columbia Basin Project to help

address the aquifer declines, presented after Ben. There appears to be a strong synergy between the work of the CBDL and the Mid-Columbia Resiliency Coordination Project.

Long-term Monitoring Network

Commerce held a meeting in Moses Lake on December 10 to discuss the idea of a Long-term Groundwater Monitoring Program for the Mid-Columbia Basin. The purpose of this meeting was to invite federal, state, and local agencies to discuss and brainstorm about what a long-term groundwater monitoring program could look like given the resources of the different organizations. Attendees included staff from USGS, Ecology, Health, local health jurisdictions, conservation districts, economic development organizations, county commissioners, ports, irrigators, and water systems. There were 26 attendees. Feedback from the meeting was positive.

Each organization identified what resource they have available, whether it is staff experienced with monitoring, tools, funding, or data management capability. Ecology does ongoing monitoring on a limited basis in the basin, mostly of irrigation and monitoring wells. USGS has data for certain timeframes, but they do not regularly collect data unless it is associated with a particular project. USGS does have ongoing monitoring of one well in the four-county area located southwest of the City of Davenport in Lincoln County. USGS does occasionally have limited financial resource to assist in monitoring efforts. Lincoln County Conservation District has an ongoing groundwater monitoring project that could potentially be expanded across all the counties. The other conservation districts all indicated, they have the staff, tools, and expertise to do this work, but there is not currently any funding to support it.

Brainstorming sessions were conducted about what a monitoring program might look like. Commerce has produced a document with three cost alternatives based on low, medium, and high funding ranges. Details for the three monitoring program options can be found in Chapter 5

Regionalization Efforts

Consolidations

Consolidations are mentioned here because there was considerable dialog about this at the Othello Outreach meeting in July 2018. Health has funded numerous feasibility studies in the area, and the water systems attending were interested in keeping consolidation with the City of Othello as an option.

In many areas of the basin, consolidations would likely be a last resort because of the distances between many of the water systems, however near Othello and Moses Lake there exist many small water systems adjacent to a large municipality. Consolidations in more isolated areas would most likely be an option of last resort and involve the development of a regional surface water source to be pumped to distant water systems that do not have any other source options.

Regionalization Efforts by Rural Community Assistance Corporation (RCAC)

Project staff attended three meetings in 2019 located in Davenport, Lincoln County, led by RCAC to discuss the prospect of water system regionalization in the county. The participants want to move

forward with asset inventories and exploration of activating the dormant PUD. Opportunities exist for mutual aid, equipment sharing, and even the sharing of operators.

Coalition Building

The need for local advocacy around declining groundwater was identified early on in the process because the water systems themselves are a very small portion of the overall demand being placed on the aquifers. If their direct actions by means of operating their water systems will not have a significant effect on the overall situation, they need another way to have an impact. The best way to do that is to encourage solutions to transition the farmers irrigating their crops with groundwater to other sources. For many of the farmers, it was anticipated that their use of groundwater would only be temporary while the Columbia Basin Project was completed, at which point they would being using project water. This did not happen, and while the Odessa Groundwater Replacement Program is slated to transition half of the remaining groundwater irrigation wells to project water, there remains a large gap. By forming a coalition to advocate for these solutions, it provides a voice for the small water systems that individually would likely not be heard at the State and Federal levels.

Commerce set forth to hold a series of facilitated meeting for the purpose of exploring the idea of forming a coalition of water systems, and supporting that effort should the participants decide to move forward. The Washington State Conservation Commission was contracted to provide facilitation services. Marie Lotz, the District Manager of Grant County Conservation District, specifically recommended Ray Ledgerwood with the Commission for facilitating the meetings. All the meetings were held in Moses Lake. The meeting dates and attendance numbers are as follows (Commerce staff was excluded from these numbers):

O March 15, 2019 - 31 attendees

This meeting was introductory and presented the concept of forming a coalition of water systems to work towards advocating for solutions to sustain the groundwater located in the Columbia Basin's aquifers. Attendees participated in visioning exercises, identified future accomplishments, and created a list of benefits to building a coalition. Mayor Logan presented on the work the City of Othello is doing to maintain a reliable source of water and support future growth.

O April 12, 2019 - 39 attendees

This meeting began with examples of other water resource-focused groups around the state that could be used as models, and a discussion about long-term monitoring. Ty Wick, founder of the Spokane Aquifer Joint Board, presented on the process and reasoning behind the formation of that organization and the benefits to its members and the region. Stakeholders were given the opportunity to share why this effort is important and how they could be involved. Participants identified concerns about forming a coalition.

O May 10, 2019 - 31 attendees

Meeting attendees started the meeting by sharing updates since the last meeting. Washington State Representative Mary Dye of the 9th Legislative District attended the meeting and shared her work to bring in more Federal dollars for the Columbia Basin Project. There were discussions about coordination with existing groups, and long-term groundwater monitoring. Grant funding for coalition development was strategized for the USBR Cooperative Watershed Management

Program (Phase 1). Proposals were created for the coalition name, mission, and a steering committee was identified. Columbia Northwest Engineering provided delicious BBQ.

June 20, 2019 - 25 attendees

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Meeting attendees started the meeting by sharing updates since the last meeting. The group chose Columbia Basin Sustainable Water Coalition as their name. A mission statement was developed. There was a thorough discussion about the USBR grant criteria and anticipated timeline expecting a Notice of Funding Availability in July. Examples of foundational documents were reviewed and strategic priorities were discussed. A letter of project support was circulated through the group for signatures.

O August 15, 2019 - 21 attendees

Meeting started with a review of last meeting, and an announcement by Ben Serr that he would be presenting on the project at the AWWA Pacific Northwest Section conference in Spokane at the end of April next year and is looking for co-presenters. Kevin Lindsey volunteered to present alongside Ben. Kevin has been involved with the Lincoln County groundwater monitoring work and the GWMA. It was reported that the USBR grant application opening had been delayed until August, and that Ben would not be available for working on the grant application as anticipated. The assignments for the grant were reshuffled (as of August 30, 2019, the grant application was still not open). There was a discussion about the USBR Applied Science Grant being an opportunity for developing a more robust groundwater monitoring network. A one-page hand out was developed and presented to the group at this meeting. The purpose of the document is to begin getting the word out about the Coalition. Improvements were suggested, and they will be incorporated into the document. The Columbia Basin Development League presented a proposal for services that could be provided to support the coalition. There was a discussion about purveyor representation in the coalition and how to increase their involvement. Outreach to legislators was discussed, and what data would be helpful for the group to have going forward. Attendance was lower at this meeting because many regular attendees were on vacation or had other conflicts.

The next meeting is scheduled for October 16, 2019 at the Moses Lake Fire Station from 9:00 am to 1:00 pm.

The Water System Coalition Building Meetings were successful in forming a coalition of water systems and other stakeholders. This coalition needs continued support of to get them up and running. See the recommendations section for more information.

All the meeting materials are located in Appendix K.

Project Support

Documentation of project support is located in Appendix B. It should be noted that all the meetings were well attended, and people continued to come back and contribute to moving this effort forward.

Water System Interviews

Commerce contacted the 13 water systems that had reported problems with their wells in the 2018 survey to provide clarity about their situation. Only three water systems chose to participate in the interviews.

Town of Lind

Interview with Joe Pessutti, operator for the Town of Lind (WS ID: 47350), Adams County, on August 29, 2019

The Town's water system has two wells, Well #7 (S01), and Well #8 (S04). They have a third well for emergency purposes, Well #6 (S02). Well #6 is not connected to the water system and is used for non-potable purposes such as construction water and other needs.

Well #8 is the primary production well, with Well #7 used as a supplemental source. Well #8 is encased to a depth of 720 feet. Well #7 is encased to a depth of 537 feet. The two wells maintain water levels in their own reservoirs, which are hydraulically equal. Well #8 is not able to fill the reservoir near Well #7 due to distance and waterline capacity.

Both of the wells have been experiencing declines. Data from Well #8 indicates it dropped on average approximately 2.6 feet per year, with a total decline of 50 feet from 2000 to 2018. Well #7 declined about 4.5 feet per year with a total decline of 157 feet from 1980 to 2015. There are large gaps in this data, and Well #8 appears to show water levels recover slightly every year in October after the irrigation season has ended, but still has an overall downward trend. Without data from the same time period every year, it is difficult to know exactly the rate of decline in both of these wells.

Well #7 was lowered twice to keep up with the groundwater decline. It was lowered 40 feet in August 1998, and lowered another 100 feet in May 2015. A Variable Frequency Drive (VFD) has been installed to limit drawdown associated with starting the pump. Well #7 has been experiencing an increase in the amount of air in the water produced. It has been constant for the last two years and has been generating customer complaints. Mr. Pessutti does not know where the air is coming from. He believes the water level is roughly 100 feet above the pump when pumping, although he suspects a problem with the air-line and does not trust the information he gets from it. The water level above the pump ranges from the high 90s to 134 feet. It never goes above 134 feet.

Well #8, is now starting to have air in the water on occasion. Water levels above the pump used to be at 135 feet. It is now about 80-90 feet in the summer, with levels dropping as low as 60 feet on startup, which triggers the low-level alarm. The well used to produce 1500 gallons per minute. It is now producing 1150 – 1200 gallons per minute. Mr. Pessutti said they "need to start planning and to think about doing something" to maintain reliability in Well #8.

The Town of Lind is planning to implement some system improvements to maintain system reliability. They have applied for Community Development Block Grant funds to install a VFD on Well #8 to reduce the initial drawdown on startup. They are also planning to reconfigure the distribution system so that Well #8 can fill the reservoir near Well #7 in the event that Well #7 becomes unusable.

Well data is located in Appendix F.

North Shore Acres

Interview with Del Sanford with North Shore Acres water system (WS ID: 03370), Grant County, on August 27, 2019

North Shore Acres has two wells in a well field, Well #1 (S01) and Well #2 (S02). Both wells are encased to a depth of 106 feet.

Mr. Sanford reported that the initial groundwater level in 1992 was 79'10" below ground level when first drilled. Recent measurements have been consistent with the 1992 level, with 79'3" measured in 2018, and 80'6" in 2019. He reported that groundwater levels were 3 feet lower than the current levels in 2012. He does not believe the groundwater levels are a concern at this time, even though it was reported in the survey that they were having problems.

Mr. Sanford credits the water level recovery to the implementation of the water use efficiency program. In 2012, the wells produced 5 million more gallons than they did last year, while adding 15 – 17 new homes on the system. Total production in 2012 was 22 million gallons, and in 2018 total production was 17 million.

Service meters were installed on all connections in 2013. At that time, they changed from a flat rate to an inclining block rate fee structure.

City of Moses Lake

Interview with Chad Strevy, Water Division Supervisor for the City of Moses Lake (WS ID: 56300), Grant County, on August 30, 2019

The City of Moses Lake has 18 active wells. Their wells range from shallow to deep, with 15 of the 18 encased below 500 feet. The shallowest well is encased to 135 feet, and their deepest is encased to 1,238 feet.

The city has been experiencing well problems due to groundwater decline. Well #33 (S26) is experiencing decreased production, and is now limited to running once per day. If it is run more frequently, it begins to pump air. This well is encased to 681 feet. The production capacity in Well #9 (S06 – encased to 1100 ft.) and Well #14 (S20 – encased to 1027 ft.) has been reduced by about 30 percent because of groundwater depletion. The city has pulled, on average, one well per year for the last ten years because of lowering groundwater.

The city monitors most of their wells for groundwater levels and maintains the information in a database that can be made available. Because of the dynamic pumping of the City's wells, it can be difficult to evaluate the aquifer levels from year to year. For example, one well may have been used frequently in January of one year, but not the next, which can have noticeable effects on the water levels. They have relied on the detailed GWMA report for the City of Moses Lake for understanding what is occurring.

The City has been exploring the development of shallow wells to offset the reduced production from their deep wells. There are several challenges faced by switching to shallow wells. They need to be careful about groundwater contaminants. North of the City is the Grant County International Airport, formerly Larson Air Force Base. There are documented plumes of groundwater contaminated with trichloroethylene (TCE). The area is a Superfund cleanup site. Pumping of shallow wells can move the plume and contaminate wells. Currently Well #29 (S16), the City's most shallow well, is limited to pumping 800 gpm so that it does not disturb the TCE plume in the area. Another challenge to accessing

shallow water is the City's water rights. There is uncertainty around the City's shallow water right claims. This issue must be resolved before new wells are developed. If it does not turn out favorably for the City, they may have to find rights to purchase. The city is considering the development of a wellfield southwest of town to try to avoid the TCE contaminated areas.

When asked about consolidations in the area, Mr. Strevy said that there have been conversations but nothing has gone forward. Typically the barriers are: resistance by the smaller water systems to being taken over, water systems over-valuing their system and wanting to sell it to the City, or the water systems are in such poor condition, that the necessary investment in the system is not worth it for the City to pursue. The City remains open to considering consolidations in the future.

Coordination Efforts

Office of Columbia River - Policy Advisory Group

Commerce staff attended all of the Policy Advisory Group (PAG) meetings during the project period, with the exception of the June 20, 2019 meeting. Commerce hosted a coalition building meeting that day and was unable to attend. Commerce has been keeping OCR informed about the project efforts.

Information on the PAG meeting can be found on their EZ View website at: <u>https://www.ezview.wa.gov/?alias=1962&pageid=37050</u>

Washington State University

Ben Serr has met with Professors Sasha McLarty and Julie Padowski to coordinate efforts of this project and their work on the update of OCR's 2021 Columbia River Basin Long-Term Water Supply and Demand Forecast. Dr. McLarty is working on the groundwater demand portion of the forecast, while Dr. Padowski is assigned to municipal demand. One of the update items that was proposed, but not funded, was an expanded monitoring network across the Columbia Basin. This proposal was very useful in developing the Long-Term Monitoring Network meeting and alternatives. In August 2019, discussion took place about collaborating with the University to apply for the USBR Applied Science Grant to support the development of an expanded monitoring network. This will be an ongoing effort beyond the end of the project.

Columbia Basin Development League

Ben Serr presented to the Columbia Basin Development League (CBDL) board and provided a write up of the project work for their newsletter. The CBDL has been supportive of the coalition building effort as it aligns with their goal of seeing the build out of the Columbia Basin Project including the East High Canal. They have been involved in all the coalition building meetings and provided a scope of work for services to support the initial formation of the coalition.

Chapter 5: Recommendations

Water System Water Level Data Reporting and Repository

Develop an online reporting system for water systems to report their required seasonal measurements. The Department of Health could do this adding a reporting page to the annual Water-Use Efficiency Report. The water system operators would collect the measurements. That data could then be managed in a database for future analysis and decision making about outreach and technical assistance efforts. By asking for this information, more water systems will measure depth to water in their wells. We were told several times throughout this project that operators would not measure if Health did not ask for the information. The risks of losing equipment in the well and introducing contamination made it not worth doing. Another downside to this approach is the chance to import bad data into the database. This is a known issue with the Water Use Efficiency reports that water systems must provide to Health. This addition to the reporting form may be able to be accomplished with Health's in-house IT staff.

Alternatively, it may be possible to collaborate with an organization such as the State of Washington Water Research Center (WRC) at WSU, to develop a data portal and management system. The Water Research Center is a non-regulatory third party, and more water systems may feel comfortable sharing water level data. The WRC may have the ability to verify data before adding it to their database. Ecology has a process for verifying the information going into their Environmental Information Management (EIM) database. Ecology does not have the capacity at this time to take on addition data sources because of this data verification step.

Appendix A includes a simple reporting form for water systems to use in conjunction with Department of Ecology's well level measurement guidance.

Long-term Monitoring

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There is a need for developing a more robust groundwater monitoring network in the Mid-Columbia Basin that includes water systems. We know there are groundwater declines occurring in this area, but the extent is not well understood. Many of the systems in the basin are very small and lack the resources, tools, or expertise to monitor water levels in their wells. This leaves them at risk for well failure. A comprehensive monitoring program could bridge this gap. To pursue this idea, a meeting was held in Moses Lake on December 10, 2018 to gather interested organizations and expertise to develop possible program alternatives. Participants included state and federal agencies, as well as county commissioners, staff, and conservation districts. Current and historic monitoring efforts were shared with the group, as well as examples of monitoring programs in other states. While a consensus surrounded the need for such a program, where such a program would 'live' and be maintained was left to question. Overall, participants agreed a well monitoring program would produce three main outcomes. Those include:

Data collection will inform decision makers about existing groundwater supplies.

- It will identify areas of investment for water infrastructure projects and the development of alternative water supplies.
- It can be used to improve public awareness about water use in the Columbia Basin.

Three alternative approaches were developed to achieve these outcomes. They range in cost and who implements the program. The alternatives are as follows:

Option #1 "Meeting Basic Needs"

The basic needs of water systems are to have enough information to make informed decisions and meet Department of Health (DOH) regulatory requirements. DOH requires static water measurements in each well seasonally, and those measurements must capture the high and low demand periods (<u>WAC</u> <u>249-290-415(10)</u>). System operators will also want to know water levels under pumping conditions because failure due to decline will happen when the pump is running.

Program outline:

- Work with existing entities to collect water system well data. The county conservation districts are local and have the tools and expertise. There may be opportunity to work with other agencies as well such as the Dept. of Ecology, US Geological Survey, and Washington State University.
- O Determine what equipment is required to meet the minimum needs while being economical, safe, easy to use, and consistent.
- Coordinate data standards for measurement and reporting so that data collection is consistent across the four counties. This will allow for direct comparisons.
- Coordinate data management so that it is easily retrievable for the water systems to satisfy decision making and reporting needs.
- Add another measurement during peak summer demand to collect data on the pumping water levels. This is not required by DOH.

The major challenges to this approach are:

- There is no established funding source. The water systems will need to find a way to pay for the well-level monitoring service. This could be done through the formation of a membership funded water system coalition. The membership dues could pay for the measurement services. This would be a member benefit and reduce costs through economies of scale. There may be limited federal funds available through the USGS or USBR to support this type of effort.
- The cost to have the conservation districts contract for this work has not been established. A WSU proposal estimated costs of roughly \$800 per well per year, but it was unclear what the frequency of monitoring was, so this estimate may be high if the well is to be monitored only four times per year.
- The current capacity of the conservation districts to take on this additional work is unclear. If the demand for these services was high, they may need additional staff.

• There would have to be some level of coordination between those collecting and managing the data to establish data standards.

The major benefits to this approach are:

- O Low cost.
- Locally led, grassroots effort.
- It would satisfy DOH regulatory requirements.
- It does not require an outside funding source.
- Takes advantage of local expertise, equipment, and resources.
- O Data management using a spreadsheet.
- It could provide enough information to determine trends in the aquifer.

This option provides only a basic view of the water level conditions in the aquifers. This would be a big improvement over the current level of understanding of the aquifers from a water system perspective. It may be difficult to engage the public with this information without additional data analysis. Even so, data with validity and consistency is very valuable.

Option #2 "The Intermediate"

As suggested, "The Intermediate" creates a middle ground benefit. It elevates the program beyond what Option #1 provides, but it is still financially constrained.

Program outline:

- Create a "Management Partnership" of water system representatives, agency staff, and other stakeholders for coordination of program objectives. The Palouse Basin Aquifer Committee or Walla Walla Watershed Management Partnership (RCW 90.92) could be used as a model.
- Work with existing entities to collect water system well data. The county conservation districts are local and have the tools and expertise. There may be opportunity to work with other agencies as well such as the Department of Ecology, US Geological Survey, and Washington State University. This is essentially the same as Option #1. The difference would be that these organizations would have more involvement and potentially provide outside funding, either through DOH, Ecology, or directly from the State Legislature. Grant funding may be available to support this work. Specifically the USBR Applied Science Grant would be a good source of funding for establishing the network.
- Monitoring equipment would likely be pressure transducers installed within a "tremie pipe". This type of installation is being used at a water system in the Palouse for gathering data as part of the Palouse Basin Aquifer Committee's groundwater monitoring efforts. Installation is estimated to be \$500 \$2000 per well depending on well depth and equipment specification.
- The Management Partnership would coordinate data standards for measurement and reporting so that data collection is consistent across the four counties. This will allow for direct comparisons.
- Coordinate data management in a database internally or with Health, Ecology, or WSU so that it is available through an online portal and is maintained for historical purposes.
- The Management Partnership would develop an internal and external communications protocol for meeting/discussing program deliverables as well a data reporting
- The Management Partnership would oversee an annual report given to counties, and state agencies to assess aquifer health.

The major challenges to this approach are:

- It would require a dedicated long-term funding source. This would likely be through a state agency budget or through a formal appropriation by the state legislature, much like the Walla Walla Watershed Management Partnership. There may be federal grant funds available through the USGS or USBR to help establish this type of regional effort. This would likely require support by local legislators.
- Regular reports to the legislature may be required if they provide an appropriation.
- There would have to be some level of coordination between those collecting and managing the data to establish data standards.

The major benefits to this approach are:

- It would be locally led and regionally coordinated.
- O This would be a much more robust effort than Option #1 in terms of what could be accomplished.
- The data gathered from this option would be more comprehensive than the first option.
- This would allow funding for paid staff and contracting with conservation districts.
- It would satisfy Health regulatory requirements. (Same as #1)
- Takes advantage of local expertise, equipment, and resources. (Same as #1)

"The Intermediate" would provide significantly better data for understanding the changes in the aquifer. Another major bonus would be a built in relationship with many of the stakeholders and the option to kick start a public outreach program from this work.

Option #3 "The Gold Standard"

"The Gold Standard" is meant to show what it might take to have a full-scale effort towards data collection, planning, and public participation. This option would encompass most of the benefits of the first two options. It would expand the work that Ecology currently does.

Program outline:

- While cost may be orders of magnitude higher, the outcome would be a paradigm shift for groundwater monitoring in the state. Borrowing from the <u>model developed by the State of Texas</u>, and now in development in Arizona, the water monitoring program would be managed at the state level, including strong policy and financial support from the state legislature.
- A detailed understanding of the future of water for the entire state of Washington is critical to economic, social, and environmental success. Statutory changes for the reporting requirements of the various water systems may be necessary. Exempt wells, for example, may need monitoring or metering devices to understand the amount of water actually used not for punitive or fee driven measures, but to have a real use data.
- Sustained funding cycles would need to be agreed upon and secured so work is not halfcomplete and then unfunded. This plan requires big, long-term thinking as well as some dedicated members of the state legislature to carry the torch for funding this program.
- This option would likely be implemented through an expansion of the water resources program at the Department of Ecology.
- Purchasing well monitoring telemetry devices for remote readings of water levels would provide near real-time data. This equipment could be considered for any of the other program options.
- Hire expert staff to inform best practices for water conservation and develop sound policy for the entire state. Also, hire graphic designers to represent the data visually as well as to create public outreach materials to inform about water levels.

The major challenges to this approach are:

- Cost. It would be in the millions of dollars. The Texas Water Development Board's operating budget was \$181 million in 2018 and employed 329 people.
- It would require a heavy lift from the legislature to create dedicated long-term funding source. This would likely be through the Department of Ecology; however, Texas created a separate state agency under the Texas Water Development Board. A similar approach could be taken in Washington.
- This would likely require new legislation.
- Revamping the water resources approach in the state may be required.
- It would not be led at the local level.

The major benefits to this approach are:

- There may be federal grant funds available through the USGS or USBR to help establish this type of effort. This would be a much more robust effort than Option #1 in terms of what could be accomplished.
- O The data gathered from this option would be far more comprehensive than the first two options.

- It would benefit other parts of the state.
- This would allow funding for paid staff and resources.
- It would satisfy Health regulatory requirements. (Same as #1)

Other work the agency could perform would be:

- Refining the understanding of which water systems are most impacted by groundwater decline.
- O Determine aquifer location where water is available, but there exists water quality issues that prevent it from being used for drinking water (i.e. taste & odor, temperature, contaminants, etc.).
- Analyze what additional demands population growth and land use changes will place on groundwater supplies (OCR may be doing this as part of their Columbia River Demand Forecast).
- Analysis of water rights seniority across the basin.
- O Promote educational materials for the public about the relationship between land use, water use, and economic development.
- O Determine possible impacts to water systems, irrigators, and the regional economy if the groundwater water is used up. What is the cost of ignoring the issue?

This approach would put Washington State alongside other national leaders in water resource management. Even if not feasible at this time, it would benefit the state to look to other leaders on this front and utilize their ideas, and implement pilot programs to illustrate how it could be done here.

Closing Observation

While the ideal program is likely a combination of these various parts, imbedded in each program is a need for continued communication between 'program' staff (Ecology, Commerce, Agriculture, Conservation Districts, Health, etc.) to inform each other of different happenings throughout the Basin and an effort should be made to begin this information sharing.

Support for the Columbia Basin Sustainable Groundwater Coalition

The Columbia Basin Sustainable Groundwater Coalition was formed as part of the outreach efforts of this project. A series of what was initially three, which then became five, facilitated meetings took place from March through August 2019. The purpose of the meetings was to discuss and support the formation of a coalition of water purveyors and other stakeholders for locally driven recommendations needed for addressing groundwater supply and monitoring issues. The work from this group is expected to influence and inform decision makers so that they may create policies and direct resources for long-term groundwater solutions. In this time, the coalition has developed their own identity, vision, and mission statement. This is in the process of being refined, but the working information at the August meeting included the following:

PROBLEM STATEMENT:

Groundwater levels in areas of the Columbia Basin have been declining for decades and now impact drinking water wells. It is critically important that water systems have a reliable water source. A broad stakeholder coalition was initiated to develop locally and regionally implementable activities to address the issue.

VISION-Why we exist:

To protect and maintain a water supply for present and future generations of the Columbia Basin

MISSION-What we do:

Address groundwater supply with active support and involvement of stakeholders creating locally driven recommendations that influence water delivery methods and influence and inform policymakers so they may create policies and direct resources for long-term groundwater solutions

STAKEHOLDERS-Who is affected:

Grant, Lincoln, Adams and Franklin County Officials, Municipalities, Ag Organizations and Commissions, Water Purveyors, Water-User Businesses, Environmental Groups, State and Federal Agencies, Chambers of Commerce, Tribal Nations (Colville, Yakama, Spokane), Educators, State and Federal Elected Officials, Irrigators, Irrigation Districts, Conservation Districts, Water Organizations: Columbia Basin Development League, Pacific Northwest Clean Water Association, etc.

SHORT-TERM PRIORITIES:

- O Build diverse and inclusive stakeholder group
- O Develop budget for grant applications
- Create foundational documents
- O Set monthly meetings
- O Develop communication/outreach plan
- O Consensus to address groundwater decline
- O Gather aquifer data for decision making including past groundwater studies

LONG-TERM PRIORITIES:

- O Develop a regional groundwater recharge plan
- Communicate the concept of water and wastewater as commodities and the benefits of water recycling
- Talk with the general public about the gravity of the declining aquifer situation in order to gain support for Coalition efforts
- Preserve drinking water sources by supporting transition of deep-well irrigation to Columbia Basin Project water or other sustainable sources of water

- O Support state and federal agencies actively working to build out Columbia Basin Project
- O Support the completion of the Odessa Ground Water Replacement Program and East High Canal

STEERING COMMITTEE:

Marie Lotz - Grant Co. Conservation District

Shawn O'Brien - City of Othello

Judi Ellis - City of Moses Lake

Paul Wollman - Warden Hutterian Brethren

Mark Stedman - Lincoln Co. Commissioner/Columbia Basin Development League President

David Wells - Councilmember Town of Wilbur

Needed Support

<u>The Coalition would benefit greatly from state support as the organization is being established.</u> They are pursuing federal grants for this purpose, but state resources would be very helpful. In the near term, Health, and other state agencies could assist the coalition with:

- Grant writing support for the <u>USBR WaterSMART Cooperative Watershed Management Program</u> Grant: Phase I. The notice of funding availability is expected in the third quarter of 2019. The Lincoln and Grant County Conservation Districts are working together and will determine which of them will be the primary applicant and divide the work up. Adams and Benton-Franklin County Conservation Districts are supportive of the effort. The main contact for coordination is Kristen Balko at the Lincoln County Conservation District. Grant funding is expected to be \$100,000 for two years. There is no matching requirement. A letter of support from Health for this grant would also be beneficial to the application. Sheryl Howe (ODW State Hydrogeologist) indicated she might have the capacity to support this effort.
- Meeting facilitation support would be very helpful in establishing this group. Commerce had tremendous success working with the State Conservation Commission to facilitate the four initial coalition-building meetings. The cost for facilitation through the Conservation Commission was less than \$2000.00 per meeting. The next major steps are to develop a multi-year strategic plan including elements for communications and outreach, advocacy, and goals and objectives; an annual work plan; and foundational documents such as articles of incorporation and bylaws. Eight to twelve facilitated meetings over the course of a year is recommended, with half of the meetings being for the Steering Committee and the other half being general Coalition meetings.

Local, State, and Federal Agency Coordination

The Department of Commerce, as part of this project, has been coordinating some communication between state agencies and other organizations around the issue of groundwater depletion, and a

discussion about long-term outcomes. This issue is important to the water systems, farmers, cities and towns, and counties. Availability of water underpins these communities and the regional economy, which contributes significantly to the state economy.

An interagency working group between the Department of Health, Department of Ecology, Department of Agriculture, and Department of Commerce specific to this groundwater depletion issue would be beneficial in coordinating efforts between the agencies. Other groups that could be included are tribes, the U.S. Bureau of Reclamation, the U.S. Geological Survey, the Washington State Water Research Center at Washington State University, the Washington State Department of Fish and Wildlife, the Washington State Conservation Commission, counties, irrigation districts, local conservation districts, and local health jurisdictions.

The purpose of this working group is twofold:

- Work to expand the groundwater-monitoring network to gain a better understanding of the groundwater conditions. It will be important to have data, before and after, to show how large infrastructure projects, such as the Odessa Groundwater Replacement Program (OGWRP), are affecting the conditions of the aquifers. By including water systems in the network, the local decision makers will be able to plan for their wells and future water sources. Municipalities need to plan for their own growth, not just for their water systems. If there are physical limitations on available water, their growth plans need to incorporate that, in order to not exacerbate the problem.
- Work collaboratively on sustainable infrastructure solutions for all water users in the basin. Ecology's Office of the Columbia River has been doing the bulk of this work through the OGWRP. Health, Agriculture, and Commerce all have interests in the area, and these agencies should be coordinating their efforts. OGWRP has been a difficult project for OCR and they are still working to secure the funding for completing it. The East High Canal is an even larger undertaking. If the East High is determined to be infeasible, it will require additional decisions about who can continue to draw water from the aquifers and for how long. This work requires coordination between agencies for the State to approach this issue effectively.

We recommend that the workgroup meet at least every six months.

Regionalization

This project considered three types of regionalization in the Mid-Columbia basin. Two were based on other ongoing efforts in the region and the third was water system coalition formation covered above. The other two were the consolidation of water systems and regionalization efforts in Lincoln County.

Consolidation of Water Systems - This was a topic of conversation at the Othello outreach meeting in July 2018. Health has invested in eight feasibility studies in the area to explore connecting the small water systems around Othello to the City's water system. The City is still promoting this as a solution for dealing with local groundwater depletion. They are exploring the use of canal water, and aquifer storage and recovery (ASR) to secure long-term source reliability. The small systems around the city will not have the capacity or resources to develop similar types of solutions. A regional approach makes sense if the small neighboring systems begin to

experience well failure. One water system in the area, Adams County Water District #1 (WS ID: 22525), has already had its well fail and is intertied with the City of Othello. The systems could choose to remain as separate entities once intertied, or they could have their ownership consolidated under the City. Advantages to turning the systems over to the City include bringing the system to City standards and economies of scale. However, the cost to bring the systems up to City standards may be a barrier. Health's DWSRF consolidation funding will likely be necessary. Besides Othello, there are many small systems around the City of Moses Lake. Should those water systems begin having issues, it would make sense to consolidate them with the City's water system. The consolidation conversation is not as far along in Moses Lake as it is in Othello. Health should advance the conversation with the City to see what opportunities and challenges exist for moving towards consolidation in the area.

• Regionalization in Lincoln County - Three meetings were facilitated by the Rural Community Assistance Corporation (RCAC) in Lincoln County to explore regionalization of water systems. Participants identified challenges associated with recruitment and retainment of operators, especially as the current operators retire. Sharing operators is one approach that could reduce costs and help spread operator coverage in the region. They also explored sharing equipment and bulk ordering. The group wanted to begin asset inventories to help identify system needs and areas of overlap. One opportunity is to activate the dormant County PUD. Consolidating ownership of some of the small water systems under the PUD is a way to begin to achieve economies of scale, and cover the loss of operators. Health should continue to support regionalization efforts in the County.

Regionalization provides opportunities for increased operational efficiency, reduction of customer costs, and improved service. Health will be an important partner in the consolidation of water systems in the Othello and Moses Lake areas, and the activation of the PUD in Lincoln County should they decide to move forward. Health should consider additional funding support and training to further these efforts.

Appendix A: Water Level Monitoring Template

The following form was designed to work in conjunction with the Department of Ecology's well measurement guidance, Publication Number 14-11-004, "How to properly collect & document water level data from your well".

Link to the Ecology publication: <u>https://fortress.wa.gov/ecy/publications/documents/1411004.pdf</u>

	Type		/4, 1/4 Section; Section #; Township; Range)			Additional Comments						
	Group		Source Location (1		Measurement Method (e.g. tape,	airline, sonic meter, etc.)						
g Form					Time Since	Pump was Shut Off						
Monitorin	Inty		Well Depth to 1st Open Interval		Water Level Qualifier	(i.e. static, rising or falling)						
Well Level	Cor		Use (e.g. Perm, Seasonal, Emerg.)			Measuring Point Height						
					Measuring Point Name (e.g. top of	casing or top of access port)						
	System Name		Source Name		Depth to	Water (feet or meters)						
						Operator's Name/Intials						
	Water System ID		Source Number			Time		 				
	Water System	Information	Well	Information	Year	Date						

Appendix B: Documentation of Project Support

June 20, 2019

Mr. Mike Means Office Director Washington State Department of Health, Office of Drinking Water PO Box 47822 Olympia, WA 98504-7822

Dear Mr. Mike Means:

We, the undersigned, support the outreach efforts conducted by the Washington State Department of Commerce and funded by the Washington State Department of Health, Office of Drinking Water, under the Mid-Columbia Resiliency Coordination project (DOH Contract: GVS23068).

Groundwater levels in areas of the Columbia Basin have been declining for decades. These declines have begun to impact water systems' wells. More needs to be done to address the problem so that drinking water wells will not be adversely impacted into the future. It is critically important that the water systems in this area continue to have a reliable water source.

We support the formation of a broad stakeholder coalition to work together towards developing locally and regionally implementable activities to address this issue.

We thank the Office of Drinking Water for the resources committed to this work, and hope the department will consider additional support in the future.

Sincerely,

Name	Title	Organization	Signature
SCOTT HATSELL	Commissioner	hives to County	Sever In Huteste
Marklettedman	Comm15510Kit	Linicola Co_	Markstalme
Kristen BACKO	Project MANager	Lincoln County Diski	this Kister Ball
Jon Turk	Hydrogeolog ist	Aspect Consultin	Fink
Scott Tarbutton	Hydrogeologist	WA Ecology - OCR	SZe
DAU.D LWELLS	Individual	Town PWILber	Sweet
STEPHANIE M. WELLS	INDIVIDUAL	WILBUR	Smulelles

Mr. Mike Means June 20, 2019 Page 2

Name	Title	Organization	Signature
MATTHEW Parts	E INDINDUAL	CNW ENGINEERING	Mon
Paul Wolling	1 Treasurer	Warden Hutterian	feul ubleman
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Renel Klempel	Water Foreman	city of MosesLake	Keyel Kenger
Shawn O'Brid	en City Engineer	City of Othello	Sham Othin
Judi Ellis	Et was	City of Moses Lake	Judi Elli
Joseph Pessut	4 Rowom	Town of Lind	Jun Cento
Paula Bell	Mayor	Town of Lind	Paula Bell
RICHARD LAW	CITY ENGINEER	CITY OF MOSESLAKE	1845C
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June 27, 2019

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We thank the Office of Drinking Water for the resources committed to this work, and hope the department will consider additional support in the future.

Sincerely,

Lincoln County Economic Development Council Margie Hall, Executive Director Margie@LincolnEDC.org / 509.368.7085

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Mr. Mike Means June 27, 2019 Page 2

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SCOTTAM. HUTSELL	Commissioner	hived County	Seatim Hutely	
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MARK R. STEPMAN	COMMISSIONER	Lascoly Co.	Naph R. Stedman	
Cloria Kuchenbuch	Mayor	Wilbur WA	Ana Fucht	
Einar Larson	Mayor	Almira, WY	n	
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RosARio R. Felic	MAYOR	CRESTON WA.	Reserver Jelico	
TIMOTHY TIPTON	COUNCILMOMBER/ MAYOR PRO TEM	CITY OF HARRINGTON	1-17=	
STEVE GOEMME	DAVENDET CITY ADMIN	City of DAVENPIRT	Spy Joeunnel	
Joyce Mings	L.C. Tourism	L.C.E.D.C.	Jaya V. Mingg	۸.
Dawn S Carfield	L.C. Fairgrounds	DEFICE Manager	Alaur Samorthe Cour	fick
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Summer Falls - Billy Clapp Lake; no copyright infringement intended.

Columbia Basin Sustainable Water Coalition A Story of Collective Action

Nearly a year ago Ben Serr on contract with the Department of Commerce started a series of meetings to discuss monitoring groundwater levels in the FLAG counties (Franklin, Lincoln, Adams, and Grant). The concern is declining groundwater in the aquifers. The target stakeholders were Group A and Group B water system purveyors, i.e., municipal authorities and smaller regulated purveyors. Private, residential water systems were outside the scope.

Ben's initial problem statement was modest, and no surprise to the municipalites experienced in the earlier GWMA (Columbia Basin Ground Water Management Area) study. <u>GWMA reported in 2012</u>

Municipal and non-municipal wells inside GWMA show a combination of (1) water level declines, (2) geochemical parameters indicative of fossil-aged water, and (3) no evidence in many areas of modern recharge.

Ben held a series of meetings throughout the Columbia Basin, starting with the narrow focus of designing and funding GWMA-type monitoring that would provide reliable longitudinal data about the health of the aquifers.

The stakeholders, however, have moved to complement the monitoring initiative with

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A story of collective action.

attention to longer-term solutions and by recognizing the continuity of ground- and surface water. Again, GWMA:

One approach consists of reducing groundwater-supplied irrigation pumping to reduce stress on the aquifer system and provide a corresponding reversal or slowing of the rate at which water levels in municipal wells are declining.

This continuity, of course, is precisely what the Odessa Ground Water Replacement Project is about, and now fuels water-resource talk about completing the Columbia Basin Project with construction of the East High Canal.

The result is the Columbia Basin Sustainable Water Coalition, an advocacy group that has emerged from Ben's workshops. It is being carried forward by the significant stakeholders of mid-Columbia Basin. Members range from Lincoln County commissioners to the Warden Hutterian Brotherhood. It is potent politically. The initial policy agenda is (1) to design a ground-water monitoring and secure long-term funding, and (2) partner with the Columbia Basin Development League to lobby for completing of the Columbia Basin Project.

The Columbia Basin Sustainable Water Coalition is a model of a community of interests coming together to achieve a common objective. As the coalition moves into an advocacy role, however, it needs to be careful about how it defines itself. Water issues almost always involve public money and are usually about connectedness. These are big-tent issues that do not yield to narrow partisanship. It needs to move forward in the same spirit of community with which Ben inaugurated the project.

I encourage you to support the Columbia Basin Sustainable Water Coalition and along the way learn more about how our communities, economies, and natural resources are married.

Don Schwerin, chair

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Appendix C: Survey Questions & Results



1. Are you aware that groundwater levels in portions of the Columbia Basin have been declining?

_____Yes _____No

2. Have you had any issues with your well(s), such as declining water levels, well failure, having to deepen a well, or lower your pump?

_____Yes _____No

Please explain your answer:

3. Does/do your well(s) meet current year-round demands without having to implement water restrictions?

_____ Yes _____ No

4. Are you concerned about your well(s) meeting demands in the next five to 15 years?

_____Yes _____No

Please explain your answer:

5. How much additional water, if any, do you need to meet future water demands?

6.a. Do you currently use a water level measuring device for each of your wells?

_____Yes _____No

6.b. If no, would you be willing to install a water level measuring device for each of your wells?

_____Yes _____No

7. Would you be willing to record and report the data from the water-level measuring device(s) in order to track the health of your aquifer?

_____Yes _____No

8. Does your water system have a current planning document such as a Water System Plan or a Small Water System Management Program?

_____Yes _____No

8.a If yes, does your plan include any of the following? Please check all that apply.

_____ Strategy for dealing with a long-term water shortage.

_____ Estimate of long-range (20-50 years) water demand and supply.

_____ Evaluation of new water sources.

8.b. If no, do you have enough resources to complete a planning document now?

_____Yes _____No

8.c. What resources do you need to a water system plan now? Please include costs or other required resources.

9. Do you have a plan and the funding for dealing with the failure of your primary well?

_____Yes _____No

Please explain your answer:

10. Has your water system discussed possible sources of water if wells run dry?

_____ Yes _____ No

Please explain your answer:

11. Has your water system considered shallow, rechargeable groundwater supplies?

_____Yes _____No

Please explain your answer:

12. Has your water system considered using surface water (river, canal, or lake)?

____Yes ____No

Please explain your answer:

13. Has your water system considered water reuse (using treated wastewater for irrigation or other needs)?

_____Yes _____No

Please explain your answer:

14. Has your water system formed local partnerships with nearby suppliers to address declining groundwater supplies?

____Yes ____No

If yes, please list the water systems included in the partnership:

If no, are you considering working with nearby water systems to address declining groundwater supplies?

_____Yes _____No

15. Optional question: What is the one thing that most concerns you about your water system? Please use this space to provide any further comments.

16. Would someone from your water system be interested in participating in a meeting with other water purveyors and Commerce staff regarding Columbia Basin water supplies?

If yes, please provide the name and contact information for that person here:

Thank you for your input!

Survey Results:











Questions 6 & 7





Question 8.a.



Question 8.b.









Question 12







Last Question





Appendix D: 2018 Outreach Meeting Notes and Agendas

Note: The Lincoln County Mayors Meeting presentation is included as the example presentation. It has all the content presented at the previous meeting plus content specific to Lincoln County.

You Are Invited!

Please attend one of the regional meetings of drinking water systems to discuss the future of groundwater in the basin and how it may affect your water system

Project Background

Health & Commerce Partner for Water Systems

The Department of Health, Office of Drinking Water formed a partnership last year with the Department of Commerce, Small Communities Initiative to work with water systems on issues related to groundwater depletion in the Mid-Columbia Basin. The area of focus includes Adams, Franklin, Grant, and Lincoln counties. We need your feedback now to help us better understand how we can assist you. See how to RSVP for a meeting below.

Declining Ground Water

More than 130 water systems in the area take their water from underground water sources. Some of these sources are thousands of years old and do not refill by rain or streams. Others contain younger water, but refill so slowly that water is used faster than it is replaced. Demand for groundwater has caused the water table to drop significantly in some areas of the basin. Many water systems do not know how their wells are being affected.

Attend a Regional Meeting

Please join us at one of the upcoming meetings to discuss how we have gotten here, what we know about current conditions and efforts, results from the February water system survey, what other water systems are saying, and to voice your own challenges and concerns about the future of your water source.

LINCOLN COUNTY

Thursday, June 14, 3:00 – 5:00 pm Lincoln County Public Works Building 27232 SR25 N, Davenport 99122

GRANT COUNTY

Tuesday, June 19, 3:00 – 5:00 pm Grant County Public Works Building 124 Enterprise St SE, Ephrata 98823

ADAMS COUNTY

Tuesday, July 10, 3:00 – 5:00 pm Council Chambers, Othello City Hall 500 E. Main St., Othello 99344

FRANKLIN COUNTY

Monday, July 16, 3:00 – 5:00 pm Franklin County PUD Auditorium 1411 W. Clark St., Pasco 99301

Please RSVP

Contact Ben Serr to RSVP for a meeting, or for more information.

Email: <u>benjamin.serr@commerce.wa.gov</u> Phone: 509-724-1699







Department of Commerce

Columbia Basin Water Fact Sheet—Lincoln County



Survey Results

Across the Four County Region

- Over 40% of responding water systems are or have experienced issues, or are concerned about providing water over the next 15 years.
- The most concerned group are water systems without a water system plan. The primary reasons for lacking a water system plan are funding and expertise.
- Nearly half of respondents do not have measuring devices or are not measuring regularly.



Aquifers in Adams, Franklin, Grant, and Lincoln Counties

The Department of Commerce is working with the Department of Health, Office of Drinking Water to continue outreach efforts to water system purveyors located in the Columbia Basin. Between February and April of 2018 the Department of Commerce surveyed all 137 Group A Water Systems in Adams, Franklin, Grant, and Lincoln Counties. Results represent responses from 93 water systems. In Lincoln County, 14 of 16 (88%) local water systems responded.

What will happen if my water system does not measure water level?

When you measure water levels you understand your well conditions and can plan for needs rather than suffer a catastrophic, even permanent, loss of water. (DOH 331-572, May 2016)

Our Water Story is Unclear

Most wells in this region are located above the Grande Ronde and Wanapum aquifers, but it is unclear which wells are drawing from which aquifer or the overburden. Updated water data for these aquifers has become less available since 1988.



Contact: Ben Serr, Growth Management Services 509.724.1699 | beniamin.serr@commerce.wa.gov

		PLEA!	SE SIGN IN	Daven	Port 6/14/18
Last Name	First Name	Title	Organization	ign In w/ Initials	Email
Bell	Fred		City of Davenport	R	fredbell@centurytel.net
Hall	Margie	Exec. Director	Lincoln County EDC	175M	margie@lincolnedc.org
Goemmel	Steve -	City Administrator	City of Davenport	Did not attend	sigoemmel@centurytel.net
Stedman	Mark	Commissioner	Lincoln County	MO	<u>mstedman@co.lincoln.wa.us_</u>
Behrens	Greg	Counsin Spares Est		~	gregb1950@gmail.com_
White	Dean	Water & Soil Resources Technician	Lincoln County Conservation District	DLN	dwhite@wadistrict.net_
Gardipe	Jamie	Regional Planner	мдо нод	H	jamie.gardipe@doh.wa.gov
Johnson	Sherman	Mayor	Town of Reardan	Mu	tounofleardan @ gmail , comm
Sauer	Justin	Public Works Director	City of Sprague	Dil not sittend	publicworks@sprague-wa.us_
Webster	Rod	Public Works Director	Town of Odessa	RW	pwd@odessaoffice.com_
Reppe	Yvonne	VP	Roosevelt Lake Ranch Water Association	CA	<u>YReppe@pioneertitleco.com</u>
)	

If you did not find your name, please add your name on the attached sheets.

		PLEA	SE SIGN IN	Daven	port 6/14/18
Last Name	First Name	Title	Organization	Sign In w/ Initials	Email
Bell	Fred		City of Davenport	On first page	fredbell@genturytel.net
		Field Office Chief	USGS		
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If you did not find your name, please add your name on the attached sheets.

Davenport/ Lincoln County Meeting Notes

June 14, 2018 3:00 – 5:00 pm

14 people in attendance, plus Ben, Jon, and Cathi

Lincoln County Passive Rehydration Project; A smaller (cheaper) project than originally envisioned will fill Black Lake and Artesian (sp?) in Spring 2019.

As aquifers continue to decline, "In the meantime, they're still transferring water rights and drilling holes." – Rod Webster

Around Reardan, a few years ago WSU(?) came in and said the water was 10,000 years old and is not declining. – Reardan Mayor

Ben asked - Would you like a place to put your well data?

Maybe. It would have to be mandated to make people do it. - Rod Webster

No one is using the GWMA model that was developed.

Dean during Lincoln County Conservation District presentation – his comment made me think maybe monthly measurements are too much to expect??

Water conservation can cause problems with a city's wastewater system.

We need a long-term strategy, not snapshots of information - Lincoln County Public Health

We need better equipment for measuring - Scott Hutsell

"We have all this data but it's not solving the problem." - Yvonne Reppe

Who wants to admit their having problems with their water when it can negatively affect economic development? – Lincoln Co Public Health

Why don't people want to install measuring equipment?

What would be helpful would be a form letter that my councilmembers could sign that listed specific concerns and a specific ask to the legislature. – Rod Webster

Lack of solutions.

Passive rehydration

We/someone should have figured out why and how Pacific Lake filled up - it had been empty.

Who owns the water?

Ben would like to form a stakeholder group/ sounding board.

What does an 'ask' look like?

Lots of turnover with mayors and operators in Lincoln County
How do you build on this (Mid-Columbia) effort in a sustainable manner?

Water systems need to advocate for themselves. Water system coalition-building.

Water systems' water use is just a drop in the bucket – why is Health ODW ramming conservation down our throats?

Idea – When you issue building permits, mandate wells that are easy to measure regularly (install probe pipes / satellite sensors). Ben mentioned that new municipal wells are required to install such equipment.

Idea – Require GIS coordinates for well logs.

Toolbox - What is needed?

What do you want DOH to know? Maybe a better question is broader – What do DOH, ECY, and the legislature need to know?

We need Columbia River water.

We need to think of managing the overall water system

East Basin irrigators association sent a lobbyist to DC and got millions.

Columbia Basin Development League - need to broaden our partnerships - Mark Stedman

Maybe PWB Pilot Project could add work on coalition-building? Mayors group

Columbia Basin Water Fact Sheet—Grant County



Survey Results

Across the Four County Region

- Over 40% of responding water systems are or have experienced issues, or are concerned about providing water over the next 15 years.
- The most concerned group are water systems without a water system plan. The primary reasons for lacking a water system plan are funding and expertise.
- Nearly half of respondents do not have measuring devices or are not measuring regularly.



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What will happen if my water system does not measure water level?

When you measure water levels you understand your well conditions and can plan for needs rather than suffer a catastrophic, even permanent, loss of water. (DOH 331-572, May 2016)

Our Water Story is Unclear

Most wells in this region are located above the Grande Ronde and Wanapum aquifers, but it is unclear which wells are drawing from which aquifer or the overburden. Updated water data for these aquifers has become less available since 1988.



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etersore usas. gov benjamin.serr@commerce.wa.gov townofwilsoncreek@outlook.com electsylviahammond@gmail.com cathi.read@commerce.wa.gov ion.galow@commerce.wa.gov marie-lotz@conservewa.net Miguels@northernfruit.com amie.gardipe@doh.wa.gov jimmbaird@aol.com keenns@msn.com sckahle@usgs.gov Ephrater 6/19/18 Email Sign In w/ Initials S 162 P C M 2 2 6 0 Town of Wilson Creek Agt done fic **Conservation District** Sun Valley Orchard PLEASE SIGN IN Sage Hills 1 and 2 Fr hate Organization Grant County Farmworker Commerce USGS Commerce Commerce **DOH ODW** 0 Candidates Coisport S 20 O WRY DOUTS Program Manager **Regional Planner** hydre tech Mayor-Hydrogeologist mager Senior Planner Down Manager 2 of 2 Title Sue First Name Benjamin Kenneth Miguel Marie Sylvia Jamie Kevin Cathi Jim lon Firster Hammond Last Name Newland Sanchez Gardipe Galow Kahle Baird Read Enns Lotz Serr

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Shuler	Kristine	Clerk-Treasurer/City Administrator	City of Warden	+ Shuller	<u>kshuler@cityofwarden.org.</u>
Smits	Brenda	Regional Planner	мао ноа	A A	<u>brenda.smits@doh.wa.gov</u>
Stokke	Bob	President	Sage Hills Div 1 HOA	BS	bstokke@live.com
Strevy	Chad	Water Division Supervisor	City of Moses Lake	CY)	<u>cstrevy@cityofml.com</u>
Taff	Timm		Adams Co. Health Dept.	Ð	timmt@co.adams.wa.us
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Klempel	Reuel	Water Foreman	City of Moseshake	R	Klempelr@gmail.com
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If you did not find your name, please add your name on the attached sheets.

Ephrata/ Grant County Meeting Notes June 19, 2018 3:00 – 5:00 pm

21 people in attendance, plus Ben, Jon, and Cathi

Moses Lake PW staff noted the cost of pulling pump/ transducer issues; they have 7 or 8 wells left; in Wanapum and Grand Ronde aquifers.

Conservation District – What all is included in a Water System Plan? Importance of conservation/ efficiency efforts. However - Irrigators are consuming the vast majority of water; water systems can't control this.

It's difficult for individual water systems to advocate for themselves individually.

What about aquifer storage and replacement efforts? Othello is looking at. Moses Lake – Shallow wells more feasible.

Priorities are based on when water rights are issued; first in time, first in right.

It can become political – farmers, towns, economy are interrelated.

Where does money come from? Water systems need to advocate for themselves.

Would completion of East High Canal take stress off the aquifer(s)? We don't know if it would stabilize or slow the rate of depletion. Need to get funding for East High Canal to get more irrigators off aquifers. Columbia Basin Development League is advocating for this.

Water rights are being transferred into the area (from same aquifer); we need more information on this.

Lots of marijuana farms in Grant County - how is this affecting water?

Are we just gonna pump it until it's all gone - that's not forward thinking.

Ecology Rule regarding drop in aquifer levels; never been utilized as far as we know; possible curtailment?

Water rights from Columbia River is dedicated to agricultural purposes; what about water system use? Bureau of Reclamation – rights can be used for municipal purposes.

Lots of interests (Tribes, recreation, fisheries, etc.) – challenging to work with all when dealing with Columbia River itself.

Coalition building? Ben shared examples. Would coalition involvement be worthwhile for you? What all options are available?

Water systems' perspective has not been voiced like other stakeholders.

What would we advocate for? Coalition would need to figure that out. Possibly:

Completion of Columbia Basin Project

Next phase of Lincoln County passive rehydration project and other aquifer storage & recovery projects

Collection of basic depth to water well data; very powerful and necessary to understand the results of efforts.

Long-term measuring program

This effort needs to be owned by locals.

Conservation District is willing to facilitate data gathering effort; data evaluation; advocacy; facilitate meetings.

Ben wants to bring agencies together.

Portion of Voluntary Stewardship Program funding could be used (aquifer protection).

Small systems are spread out, but important to advocate for their concerns.

Columbia Basin Development League; closely aligned; could benefit from advocacy of drinking water systems.

Strength in numbers. Value to involvement.

Ben looking for stakeholders/ sounding board.

Columbia Basin Water Fact Sheet—Adams County



Survey Results

Across the Four County Region

- Over 40% of responding water systems are or have experienced issues, or are concerned about providing water over the next 15 years.
- The most concerned group are water systems without a water system plan. The primary reasons for lacking a water system plan are funding and expertise.
- Nearly half of respondents do not have measuring devices or are not measuring regularly.



Aquifers in Adams, Franklin, Grant, and Lincoln Counties

The Department of Commerce is working with the Department of Health, Office of Drinking Water to continue outreach efforts to water system purveyors located in the Columbia Basin. Between February and April of 2018 the Department of Commerce surveyed all 137 Group A Water Systems in Adams, Franklin, Grant, and Lincoln Counties. Results represent responses from 93 water systems. In Adams County, 15 of 28 (54%) local water systems responded.

What will happen if my water system does not measure water level?

When you measure water levels you understand your well conditions and can plan for needs rather than suffer a catastrophic, even permanent, loss of water. (DOH 331-572, May 2016)

Our Water Story is Unclear

Most wells in this region are located above the Grande Ronde and Wanapum aquifers, but it is unclear which wells are drawing from which aquifer or the overburden. Updated water data for these aquifers has become less available since 1988.





Department of Commerce contact: Ben Serr, Growth Management Services 509.724.1699 | benjamin.serr@commerce.wa.gov

Last Name	First Name	Title	Organization	Sign In w/ Initials	Email
Bell	Paula	Mayor	Town of Lind	QB.	<u>townoflind@sosmail.us</u>
Brown	Kevin	Watermaster	Ecology ERO	see oner	pabr461@ECY.WA.GOV
Farris	Wade	City Administrator	City of Othello	SEE OTHER	wfarris@othellowa.gov
Galow	uof	Small Communities Initiative	Commerce	Tai	jon.galow@commerce.wa.gov_
Marshall	nhol	Adams County Commissioner	Adams County	N	
Pessutti	Joe	Public Works	Town of Lind	ĊÐ	ipessutti@hughes.net
Read	Cathi	Program Manager	Commerce	S.	<u>cathi.read@commerce.wa.gov</u>
Richey	Sasha	Professor	wsu	Col .	sasha.richey@wsu.edu
Serr	Benjamin	Senior Planner	Commerce	BAS	benjamin.serr@commerce.wa.gov
Smits	Brenda	Regional Planner	MDO HOD	A	<u>brenda.smits@doh.wa.gov</u>
Swift	Larry	Public Works Director	City of Ritzville		larry.swift@ritzville-wa.us

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Last Name					
	First Name	Title	Organization	Sign In w/ Initials	Email
Thompson	Terry	Adams County Commissioner	Adams County	SEE	
Wollman	Paul	Manager	Warden Huttarian Bretheren 1	M	pkwollman@gmail.com_
RINDRO	149 MK		ES TAPES	Hre	CRNARO Q SM WREET
HARVER	Ann	Holoms Cut	Adams Carp	All 7	attarvey a 200ms.
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Othello/ Adams County July 10, 2018 3:00 – 5:00 pm Meeting Notes 21 people in attendance, plus Ben, Jon, and Cathi

(Ben) Important for water systems to advocate for themselves. Advocate to state legislature, Congress; CBDL has been doing this for agricultural interests (e.g., expansion of Columbia Basin Project)

(Wade Farris) Othello is willing to consolidate smaller systems, but need funding; we'd be more efficient. Some of Othello's 9 wells have declining levels and output.

(John Marshall) Ritzville has also experience problems. Getting more ag onto surface water (i.e., East High Canal) is the most important thing to slow the decline – they are depleting aquifer.

(Othello) Othello food processors create wastewater that can be treated and reused. Othello looking into ASR.

(Retired gentleman) Problem – past studies have shown that even with the East High Canal, it would take all of the irrigators off groundwater; GWMA study said it slowed decline only a bit. (It was noted that there were different assumptions regarding adding new food processors vs. not)

But still, that alone will not be enough; what else can we do?

(Other Adams Co Comm) I went to Simplot – they are reusing water – we need to do more of that.

(Other gentleman/ economist) No federal money (BoR) will be available expansion of CBP. Can't even get a feasibility study done. It doesn't pencil out; doesn't meet BoR standards.

(John) State has put \$300 million into it

(Mayor Shawn Logan) What are the smaller water systems thinking?

(private system) Some would like to join city water/ some don't; it would be nice to not have to do all the testing ourselves

(other system) We are weighing pros and cons; this is difficult to discuss without a firm schedule or proposal in mind. Not sure what aquifer we are in, but wells have declined

(Lind operator) We just had to deep a well recently; it has been declining \sim 5 ft/year (their 1,000 foot deep well, that is) It also has entrained air in the water which can cause problems in the distribution system.

Some systems experience higher (naturally occurring) fluoride with less use.

Are systems interested in putting together a coalition? Some say yes.

(Mayor Logan) Recognizes and appreciates that Health is trying to help. Health helped Othello estimate the cost to run water lines to other systems, but it would cost at least \$10 million. But it's not if this will happen, it is when. We would like you (smaller nearby systems) to work with us to continue planning; it won't cost anything but your time at this point. We all need a sustainable plan so you don't dry out and die. Othello wants to solve the supply issue for the next 75 years. We want to include you in this process.

(Wade Farris) A coalition could pursue money for the Othello-area consolidation project. (Wade also mentioned IACC Conference and tech teams)

(Ben) We don't want to get the point of being in a crisis/ emergency. We have a problem – how to address it? What is our ask?

Ben wants to form an advisory group to act as a sounding board for him, and also something that continues on even without state involvement. Coalition could advocate for money for more well level monitoring (through OCR) – it is important to understand what is happening.

(Jon) Are the Conservation District(s) interested in this?

(Kevin/ Adams Cons Dist) Our monitoring is somewhat scattered; sometimes difficult to get

permission. We are coordinating with Grant Conservation District.

(Grant Cons Dist) We are looking for funding to continue to monitor ag wells; we could add municipal wells.

(private system) We use Health forms to do reporting; if they asked about well levels, it would be easy to report. (That made Ben happy \odot)

(Ben) We will be producing a Report, including a 'Toolbox'.

(Ben) What do you want Health to know?

We are interested in being a part of a coalition. We need to advocate (in Washington DC) to get surface water to irrigators.

It was pointed out that some irrigators on wells do not want to go on surface water now, even if they could. Cost issues. They are not required to relinquish their groundwater rights.

Are wells 'cascading' / leading to contamination? And/or leaking upper aquifer water into lower aquifer?

Columbia Basin Water Fact Sheet—Franklin County



Survey Results

Across the Four County Region

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What will happen if my water system does not measure water level?

When you measure water levels you understand your well conditions and can plan for needs rather than suffer a catastrophic, even permanent, loss of water. (DOH 331-572, May 2016)

Our Water Story is Unclear

Most wells in this region are located above the Grande Ronde and Wanapum aquifers, but it is unclear which wells are drawing from which aquifer or the overburden. Updated water data for these aquifers has become less available since 1988.





Department of Commerce Contact: Ben Serr, Growth Management Services 509.724.1699 | benjamin serr@commerce.wa.gov

mark-nielson@conservewa.net cathi.read@commerce.wa.gov jon.galow@commerce.wa.gov jamie.gardipe@doh.wa.gov rl.rommereim@gmail.com arlene.hyatt@doh.wa.gov julie.padowski@wsu.edu jenndgoulet@gmail.com Pasco 7/16/18 electzahra@gmail.com rickd@bfhd.wa.gov bhaws@jub.com Email roda Kelt 5 Sign In w/ Initials Alene 5 MM ! t -8 **Conservation Districts** North Slope Estates Franklin & Benton PLEASE SIGN IN J-U-B ENGINEERS, Benton-Franklin Health District Organization Commerce Commerce **DOH ODW DOH ODW** Property WSU Inc. Capacity Development Small Communities Program Manager **Clinical Assistant Regional Planner** Project Engineer Project Manager District Manager Vice President Surveillance & Investigation Sr. Manager Professor Initiative Title First Name Ramona Jennifer Arlene Zahra Jamie Mark Cathi Julie Rick Ben lon Rommereim Last Name Padowski Dawson Gardipe Nielson Goulet Roach Galow Hyatt Haws Read

If you did not find your name, please add your name on the attached sheets.

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Last Name	First Name	Title	Organization	Sign In w/ Initials	Email
Serr	Benjamin	Senior Planner	Commerce	SHO	benjamin.serr@commerce.wa.gov
Smits	Brenda	Regional Planner	рон орм	Je starter	brenda.smits@doh.wa.gov
Turner	Larry	Public Works Director	City of Connell	A	LTurner@connellwa.org.
Winder	Dan	Commissioner Chair	Basin City Water & Sewer District	Darwilli	dwinder@valmont.com
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Department of Commerce

Lincoln County Mayors' Water System Meeting

Benjamin A. Serr Senior Planner



We strengthen communities

Infrastructure

The Department of Commerce touches every aspect of community and economic development. We work with local governments, businesses and civic leaders to strengthen communities so all residents may thrive and prosper.



Planning



Community

Facilities



Housing



Safety / Bi Crime Victims As





Why Are We Here?

Three Main Issues:

- Declining Water Levels in Portions of the Basin
- Water Systems Need a Reliable Water Source
- Not Enough Localized Well Data



Mid-Columbia Resiliency Coordination Project

- DOH Funded Project
- Commerce Selected to Perform Outreach to 137 Water Systems in Adams, Lincoln, Franklin, and Grant Counties
- Serving ~92,000 Residents
- Limited Duration June 2019



Background



Background – The Aquifers



Data Sources: USGS, WA DOH

Department of Commerce

Background – The Aquifers



Background – The Aquifers





Background – Columbia Basin Project



Background – Columbia Basin Project Cont.

- Build Out Stalled in the 1970-1980s
 - Federal Funding
 - Endangered Species Act
 - Cost/Feasibility
 - Dryland Farming Preferred by Some
- Water Rights Were Issued
- Resulted in 30 40 Years of Pumping
- Aquifers Do Not Recharge or Very Slowly



Background - What is Being Done

- Ecology Office of Columbia River
 - Odessa Groundwater Replacement Program Expansion of the East Low Canal (Ongoing)
 - Lincoln Co. Passive Rehydration Prefeasibility Assessment Report (2011)
- Health
 - Outreach to 25 Basin Cities (2013-2015)
 - ERWOW Measurement Outreach (2016-2017)





Well Level Data



Well Level Data

- Best Sources are Dept. of Ecology and USGS
 - Lacks Continuity
 - Data Integrity Issues
 - Spread Out
 - Not Water System Specific
 - Multiple Aquifers
- No Repository of Water System Data
 - Some GWMA



Lincoln Co. CD



Well Level Data

- Best Sources are Dept. of Ecology and USGS
 - Lacks Continuity
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 - Spread Out
 - Not Water System Specific
 - Multiple Aquifers
- No Repository of Water System Data
 - Some GWMA



Ecology



Ecology



Ecology



Ecology



USGS (1850 – 1985)



USGS – Wanapum (1984 – 2009)



USGS – Grande Ronde (1984 – 2009)



USGS – Wanapum (2007 – 2050)



USGS – Wanapum (2007 – 2050)





GWMA – Aquifer Demand




GWMA – Change in Depth to Water in ft/year

GWMA – Gaps in Data



Lincoln Co. CD - Wanapum



Lincoln Co. CD – Wanapum & Grande Ronde



Lincoln Co. CD – Grande Ronde



Winter 2018 Survey Results



Well Depth and Concern



Well Depth and Concern



MID-COLUMBIA RESILIENCY COORDINATION: FINAL REPORT 2019

Well Depth and Concern



Well Depth and Concern



Data Sources: USGS, WA DOH

Department of Commerce

Well Depth and Concern



Discussion & Questions





Appendix E: Long-Term Monitoring Stakeholder Meeting



Long-term Groundwater Monitoring Program for the Mid-Columbia Basin

Stakeholder Meeting

December 10, 2018, 9am-12

- City of Moses Lake, Council Chambers
- 401 S. Balsam Moses Lake, WA 98837

Agenda:

- 9:00-9:15 Introductions Who is here?
- 9:15-9:30 Overview Why are we here?

9:30-10:00 Brief topical presentations and case studies for groundwater modeling – What has already been done?

- **O** USGS
- O Department of Ecology, Eastern Regional Office
- O Texas, Florida, Saskatchewan
- 10:00-10:30 Resources of the group What do we bring to the table?

(i.e. expertise, time, funding, tools, data management)

- 10:30-10:45 Break
- 10:45-11:30 Building a groundwater monitoring program What could this look like?
- 11:30-12:00 Next steps Where do we go from here?

Name	Sign-in with initals	Email	Organization
Ami Keiffer	AV	ami.keiffer@commerce.wa.gov	Commerce
Ann Harvey		aharvey@co.adams.wa.us	Adams County
Arlene M Hyatt	AN	Arlene.Hyatt@DOH.WA.GOV	Health
Benjamin Serr	PSS.	benjamin.serr@commerce.wa.gov	Commerce
Brenda M Smits	2A	brenda.smits@doh.wa.gov	Health
Cathi Read	Cl	cathi.read@commerce.wa.gov	Commerce
Clyde Lay		clay@usbr.gov	USBR
Corina M Hayes		Corina.Hayes@DOH.WA.GOV	Health
Dan Haller	/	dhaller@aspectconsulting.com	Aspect Consulting
Dean White	MA	dwhite@wadistrict.net	Lincoln County Conservation District
Ed Dzedzy	AT	edzedzy@co.lincoln.wa.us	Lincoln County
Elizabeth Frasser		efasser@usgs.gov	USGS
Elsa Bowen		ebowen@wadistrict.net	Lincoln County Conservation District
Harold Crose	AL AL	harold-crose@conservewa.net	Grant County Conservation District
Jamie C Gardipe	C MA	jamie.gardipe@doh.wa.gov	Health
John Marshall	>	johnm@co.adams.wa.us	Adams County
Jon Galow	14	jon.galow@commerce.wa.gov	Commerce
Kevin Brown		pabr461@ECY.WA.GOV	Ecology
Kristen Blako	KA	Kbalko@wadistrict.net	Lincoln County Conservation District
Leah Uhl	nh -	leah-uhl@conservewa.net	Grant County Conservation District
Llyn Doremus	antes	LDOR461@ECY.WA.GOV	Ecology
Marc Maynard	D	mmaynard@usbr.gov	USBR
Margie Hall	MH I'	margie@lincolnedc.org	Lincoln EDC
Marie Lotz	UNaucos	marie-lotz@conservewa.net	Grant County Conservation District
Mark Nielson		mark-nielson@conservewa.net	Benton Franklin Conservation District
Mark Stedman	mitcolman	mstedman@co.lincoln.wa.us	Lincoln County
Mary Dye		mary.dye@leg.wa.gov	Legislature
Melissa M. Downes		MNIH461@ECY.WA.GOV	Ecology
Rick Dawson		rickd@bfhd.wa.gov	Benton Franklin Health District
Rob Coffman		rcoffman@co.lincoln.wa.us	Lincoln County
Sasha Richey		sasha.richey@wsu.edu	WSU
Scott Hutsell	S with the but	shutsell@co.lincoln.wa.us	Lincoln County

Sheryl Howe		sheryl.howe@doh.wa.gov	Health
Stephen McFadden	Prusent	stantion & caradams. NR. US	Adams County Economic Development
Steve Goemmel	4		Davenport
Sue Kahle	1 Cikable	sckahle@usgs.gov	USGS
Terry Thompson	4	terry@farmerterry.com	Adams County Commissioner
Timm Taff	(1)	timmt@co.adams.wa.us	Adams County
Tom English	the	tom-english@conservewa.net	Grant County Conservation District
Tracy L. Band	AD	TREH461@ECY.WA.GOV	Ecology
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Groundwater level monitoring activities of the Washington Water Science Center

Sue Kahle December 10, 2018 Stakeholder Meeting Moses Lake

U.S. Department of the Interio U.S. Geological Survey



Outline

- Monitoring experience
- Equipment
- Organizational capacity
- Data management
- Funding

Monitoring experience

- Long-term networks
 - Few sites measured for many decades
- Project specific networks
 - Measured once at accessible wells across entire study area
 - Measured monthly/season for a few years at a subset of wells
- Depth to groundwater
 - Tape down methods
 - Pressure transducers

≥USGS



Monitoring experience – long-term network (example)

- 750' piezometer in Davenport monitoring well
- Grand Ronde Basalt
- 1971 present





Monitoring experience – project networks



Equipment

- E-tapes and steel tapes
 - Maintained by WSC personnel
 - Calibrated at USGS Hydrologic Instrumentation Facility
- Pressure transducers



≥USGS

Organizational capacity

- Personnel
 - Main office in Tacoma
 - Field Offices in Kennewick and Spokane
- Quality Assurance
 - Methods, measurements, and reporting per USGS and WA WSC requirements

Data management

- Center QA plan
- All data are collected, checked, and entered into the National Water Information System (NWIS)
- NWIS maintained indefinitely and accessible online



Open-File Report 2013-1151

U.S. Department of the Interior U.S. Geological Survey

≥USGS

Data management https://waterdata.usgs.gov/nwis



Funding

- Two primary funding sources Federal and local stakeholders
- Most local projects are stakeholder funded
- Possible partial match to start a network
- Available and interested in working with the various agencies who monitor and/or use groundwater data

≥USGS

Contacts

- Sue Kahle Groundwater Systems Section Chief <u>sckahle@usgs.gov</u>
- Andy Long Groundwater Specialist ajlong@usgs.gov
- Lisl Fasser Groundwater Data Manager efasser@usgs.gov



Focus on Eastern Region







In the past ~10 years that number dropped to ~125 wells

So why do we lose wells from our monitoring network?

- Wells go offline
 - If pump and airline are pulled we can't measure deep wells
- Airline is plugged, crimped, broken off
- Unless airline is repaired we can't measure
- No longer have suitable access to well
- Not uncommon for access roads to get
 overgrown, especially if well is not pumping
- Unsafe conditions
 - Derelict well houses, wellheads, structures can quickly become unsafe is not maintained







<section-header>













ERO Also Deploys Pressure Transducers Throughout Region

- Primarily either dedicated monitoring wells (drilled to be a monitoring well) or wells that are no longer being pumped, and we got permission to monitor
- Collects pressure reading every hour
- Pressure reading indicates height of water above transducer



What do these wells look like?





What do these wells look like?



What do the transducers look like?









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- Use gauge to measure how many psi of air it takes to push water completely out of airline
- Multiply psi reading by 2.31 ft/psi
- Subtract the result (ft) from the total vertical length of airline
- This gives the depth to the water (from the gauge)



Department of Commerce

Columbia Basin Long-term Groundwater Monitoring Program Stakeholder Meeting

December 10, 2018 Moses Lake City Hall

We strengthen communities

The Department of Commerce touches every aspect of community and economic development. We work with local governments, businesses and civic leaders to strengthen communities so all residents may thrive and prosper.





Planning Infrastructure

re Community Facilities

unity Housing ties



Safety /

Crime Victims

Business Assistance





For Today...

Who is here? Why are we here? What has already been done? What do we bring to the table? Where do we go from here?





Florida Department of Environmental Protection

- 1999 lawsuit led to TMDL regulations
- 1999-2013 Monitoring via EPA Consent Decree (from lawsuit)
- 2016-present Long-term CWA program with broader overall water quality goals

"Having CWA 303(d) Program priorities informed by data and information from other relevant programs* will help achieve and demonstrate environmental results over time."

*Fish and Wildlife, Dept. of Ag., Water Conservation Districts, environmental groups, local stakeholders.



Department of Commerce

Saskatchewan Water Security Agency



Texas Water Development Board

- 1913 Texas Legislature created Board of Water Engineers to regulate appropriates of water
- 1950's Severe drought
- 1972 Texas Natural Resources Information System
- 1985 Texas Water Development Board, responsible for long-range planning and water project financing.
- 2007/2012/2017 TWDB publishes the State Water Plan
- 2016 Online data with in-depth information about water planning

Department of Commerce



Texas Water Development Board

Examples of Online Data Tools

Groundwater Data Viewer

https://www2.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer

Water Data for Texas By Reservoirs, Drought, Groundwater, Coastal https://waterdatafortexas.org/groundwater

Major Aquifer 3D Viewer

http://www2.twdb.texas.gov/apps/waterdatainteractive/gamsdataviewer

Department of Commerce

10
WSU Groundwater Monitoring Proposal

Module 5 (M5): Groundwater Monitoring

A new groundwater monitoring effort is proposed to expand the current monitoring effort in declining groundwater areas across the study region. This effort would engage a diverse group of stakeholders, including private users, counties, conservation districts, and state agencies. The task would serve as a pilot data collection program that could transition into a self-sustaining activity lead by counties, cities, conservation districts, and/or Ecology. Without data available to track historical groundwater patterns, the ability of managers to make accurate water plans is limited. Increasing the availability of monitoring data that is continuous in time is a fundamental necessity to fully understand changing groundwater availability for current and future water rights holders. Finding ways to offload that data collection from Ecology is also perceived to be a priority given Ecology's limited capacity and other priorities. This initial investment could lead to significant new data being collected to inform Ecology decision-making without the commensurate staff investment by Ecology long-term.

Tasks (20% Phase 1, 80% Phase 2):

- 1. Conduct two-year GW monitoring of expanded network in declining GW areas using combination of spring/fall spot readings and targeted water level transducer installations.
 - a. Assume start in spring 2019 and end in spring 2021.
 - b. Assume 100 new wells, with 90% spot checks and 10% installed equipment at \$500/installation plus downloads, travel, prep and setup, and assuming get at least 5/day average.
- 2. Develop continuation program options for expanded declining groundwater monitoring network (Ecology, Conservation District, County, private for continued data collection).
- 3. Incorporate new data collection into the "Existing Data Collection" task in the Groundwater Integration module (M6).

<u>Module 5: Groundwater Monitoring:</u> This module pilots improved groundwater data collection with a goal of developing a user-pay, county-funded, or other Ecology or non-Ecology long-term program for monitoring critical water supplies that will significantly influence future demand.

- New and expanded groundwater monitoring sites to increase the ability to assess changes in current hot-spot regions
- New declining groundwater continuation program to allow long-term support for enhanced monitoring network
- Total Cost: \$163,264.00

Item	Phase 1	Phase 2	Phase 3	Total
	7/1/2018-	7/1/2019-	7/1/2021-	
	6/30/2019	6/30/2021	6/30/2022	
Core Tasks	\$32,652.80	\$130,611.20	\$0.00	\$163,264.00

ndwater Monitoring Resources Identified	nber 10, 2018	ses Lake, WA
Mid-Columbia: Long-Term Groundwate	December 1	Moses Lak

Data Management	 Historical data (mostly USGS data) QA, National Water Information System Waterdata.us.gov To develop gw flow models To develop gw flow models 1980, RASA study and repeat RASA 2015 (sue will send links to RASA dta) 	 Date used for water rights decisions, regulatory and other decisions 400 wells measured annually (historically) - 125 a year (currently) Primarily ag wells Measure annual spring highs (before pumping starts) EIM - Environmental Information Management System EROGWDB - Most ecology data Prefer transducer data
Tools/Equipment	 Measuring equipment 	 Measuring equipment Hand measuring Pressure transducers Aquifer Storage and Recovery Guidance document GPS units
Funding	 Federal \$ Stakeholder \$ Small pot of match funding (prioritized by director) 	
Staff Time		
Expertise	 Monitoring experience Quality assurance and method reporting 	 400 wells measured annually (historically) 125 a year (currently) Engineering's can meet regarding ASR
Entity	usgs	Ecology

					 Outside data can be included (if it meets with requirements for process and data collection) Dedicated E/M coordinator
Health					 Dept of Health ODW – Can require well level data to be submitted
Conservation Districts	 Grant, Lincoln (Dean) Relationships with well- owners; two- way communication, project management, fiscal agents, facilitation 	 Contract Management/ project management Facilitation Writing funding applications Fiscal agent for projects 		 Lincoln County CD – e- tape, sonic meters 	• Cons. Dist. – GIS work (tools)
Counties			 Lincoln County Cons Dist – Funding with OCR 	 GIS – Grant County 	
wsu					 Proposed data management and collection/Regional Groundwater depth monitoring
Others	 Private consultants (thru agencies, groups, etc.) Irrigation Districts 	 Staff Time: Grant CD, Lincoln CD, USGS, ECY, Benton 	 OCR - Funding for monitoring - long term Voluntary Stewardship 		 Various on-going studies – ASR, etc, contain aggregated data GWMA – Database could be expanded

Program (for	monitoring?)	• Bureau of Rec –	WaterSMART	programs (does	require match,	could be in kind)				
Franklin Health	District)	Train for	people to	measure:	 USGS, ECY, 	Lincoln County	CD, Grant	County CD	8	
OCR	 Some individual 	water systems	do a lot of their	own monitoring						

Other notes

- Communication is essential, so people know what the issues are
 - w/ public
 - w/ legislative branches 0 0 0
- w/& between agencies/partners
 - Other water technologies .
 - ASR projects
- Other studies .
- Technical education to water systems •
- What/From where/Who/How is the water (in the basin) being replaced? •

Long-Term Well Monitoring Program Options for Water Systems in the Mid-Columbia Basin

The Mid-Columbia Basin is located within Adams, Franklin, Grant, and Lincoln counties. The region has two major aquifers that supply drinking and irrigation water, the Wanapum and Grande Ronde. Documentation by the United States Geological Survey (USGS), Columbia Basin Ground Water Management Area (GWMA) studies, and the Washington State Department of Ecology has documented declining groundwater in these critical aquifers. Some portions of these aquifers contain ancient water that is not readily recharged. Pumping water from these aquifers has been compared to mining. Once extracted, it is gone for good.

The basin has over 130 community water systems that rely on groundwater to serve their customers. Together they supply water to roughly 90,000 residents. Not every water system is experiencing water level declines in their wells, but because the geology in the area is complex, the only way to know if a specific well is experiencing declines is to measure it regularly.

There is a history of well monitoring efforts across the Columbia Basin by various organizational entities. However, these monitoring efforts are not very useful for water systems wanting to know what is happening in their wells. The water systems who have a long-term history of monitoring are able to detect if they have declining water levels. More than a dozen systems have seen aquifer levels declining in their wells.

Many of the systems in the basin are very small and lack the resources, tools, or expertise to monitor their wells. This leaves them at risk for well failure. A comprehensive monitoring program could bridge this gap. To pursue this idea, a meeting was held on December 10, 2018 to gather interested organizations and expertise to develop possible program alternatives. Participants included state and federal agencies, as well as county commissioners, staff, and conservation districts. Current and historic monitoring efforts were shared with the group, as well as examples of monitoring programs in other states. While a consensus surrounded the need for such a program, where such a program would 'live' and be maintained was left to question. Overall, however, participants agreed there are three main outcomes a well monitoring program would produce. Those include:

Data collection will inform decision makers about existing groundwater supplies.

It will identify areas of investment for water infrastructure projects and the development of alternative water supplies.

It can be used to improve public awareness about water use in the Columbia Basin.

Option #1 "Meeting Basic Needs"

The basic needs of water systems are to have enough information to make informed decisions and meet Department of Health (DOH) regulatory requirements. DOH requires static water measurements in each well seasonally, and those measurements must capture the high and low demand periods. System operators will also want to know water levels under pumping conditions because failure due to decline will happen when the pump is running.

Program outline:

Work with existing entities to collect water system well data. The county conservation districts are local and have the tools and expertise. There may be opportunity to work with other agencies as well such as the Dept. of Ecology, US Geological Survey, and Washington State University.

Determine what equipment is required to meet the minimum needs while being economical, safe, easy to use, and consistent.

Coordinate data standards for measurement and reporting so that data collection is consistent across the four counties. This will allow for direct comparisons.

Coordinate data management so that it is easily retrievable for the water systems to satisfy decision making and reporting needs.

Add another collection during peak summer demand to get data on the pumping water levels. This is not required by DOH.

The major challenges to this approach are:

There is no established funding source. The water systems will need to find a way to pay for the services of those doing the monitoring. This could be done through the formation of a membership funded water system coalition. The membership dues could be used to pay for the measurement services. This would be a member benefit, and keep costs down to the members through economies of scale. There may be federal funds available through the USGS or USBR to support this type of effort.

The cost to have the conservation districts contract for this work has not been established. A WSU proposal estimated costs of roughly \$800 per well per year, but it was unclear what the frequency of monitoring was, so this estimate may be high if the well is to be monitored only four times per year.

The current capacity of the conservation districts to take on this additional work is unclear. If the demand for these services was high, they may need additional staff.

There would have to be some level of coordination between those collecting and managing the data to establish data standards.

The major benefits to this approach are:

Low cost.

Locally led, grassroots effort.

It would satisfy DOH regulatory requirements.

It does not require an outside funding source.

Takes advantage of local expertise, equipment, and resources.

Data management could be handled by a spreadsheet.

It will provide enough information to determine trends in the aquifer.

This option provides only a basic view of the water level conditions in the aquifers. This would be a big improvement over the current level of understanding of the aquifers from a water system perspective. It will be difficult to engage the public with this information without additional data analysis. Even so, data with validity and consistency is very valuable.

Option #2 "The Intermediate"

As suggested, "The Intermediate" creates a middle ground benefit. It elevates the program beyond what Option #1 provides, but it is still financially constrained.

Program outline:

Create a "Management Partnership" of water system representatives, agency staff, and other stakeholders for coordination of program objectives. The Palouse Basin Aquifer Committee or Walla Walla Watershed Management Partnership (<u>RCW 90.92</u>) could be used as a model.

Work with existing entities to collect water system well data. The county conservation districts are local and have the tools and expertise. There may be opportunity to work with other agencies as well such as the Dept. of Ecology, US Geological Survey, and Washington State University. This is essentially the same as Option #1. The difference would be that these organizations would have more involvement and outside funding, either through DOH, Ecology, or directly from the State Legislature. Grant funding may be able to be secured to support this work.

Monitoring equipment would likely be pressure transducers installed within a "tremie pipe". This type of installation is being used at a water system in the Palouse for gathering data as part of the Palouse Basin Aquifer Committee's groundwater monitoring efforts. Installation is estimated to be \$500 - \$2000 per well depending on well depth and equipment specification.

The Management Partnership would coordinate data standards for measurement and reporting so that data collection is consistent across the four counties. This will allow for direct comparisons.

Coordinate data management in a database internally or with DOH, Ecology, or WSU so that it is available through an online portal and is maintained for historical purposes.

The Management Partnership would develop a communications protocol for internal and external for meeting/discussing program deliverables as well a data reporting

The Management Partnership would oversee an annual report given to counties, and state agencies to assess aquifer health.

The major challenges to this approach are:

It would require a dedicated long-term funding source. This would likely be through a state agency budget or through a formal appropriation by the state legislature much like the Walla Walla Watershed Management Partnership. There may be federal grant funds available through the USGS or USBR to support this type of effort. This would likely require support by local legislators.

Regular reports to the legislature may be require if they receive an appropriation.

There would have to be some level of coordination between those collecting and managing the data to establish data standards.

The major benefits to this approach are:

It would be locally led.

This would be a much more robust effort than Option #1 in terms of what could be accomplished.

The data gathered from this option would be far more comprehensive than the first option.

This would allow funding for paid staff and contracting with conservation districts.

It would satisfy DOH regulatory requirements. (Same as #1)

Takes advantage of local expertise, equipment, and resources. (Same as #1)

"The Intermediate" would provide significantly better data for understanding the changes in the aquifer. Another major bonus would be a built in relationship with many of the stakeholders and the option to kick start a public outreach program from this work.

Option #3 "The Gold Standard"

"The Gold Standard" is meant to show what it might take to have a full-scale effort towards data collection, planning, and public participation. This option would encompass most of the benefits of the first two options. It would expand the work that the Department of Ecology currently does.

Program outline:

While cost may be considerably higher, the outcome would be a paradigm shift for groundwater monitoring in the state. Borrowing from the model developed by the State of Texas, and now in development in Arizona, the water-monitoring program would be managed at the state level, including strong policy and financial support from the state legislature.

A detailed understanding of the future of water for the entire state of Washington is critical to economic, social, and environmental success. Statute changes for the reporting requirements of the various water systems may be necessary. Exempt wells, for example, may need monitoring or metering devices to understand the amount of water actually used not for punitive or fee driven measures, but to have a real use data.

Sustained funding cycles would need to be agreed upon and secured so work is not half-complete and then unfunded. This plan requires big, long-term thinking as well as some dedicated members of the state legislature to carry the torch for funding this program.

This option would likely be implemented through an expansion of the water resources program at the Department of Ecology.

Purchasing well monitoring telemetry devices for remote readings of water levels would provide near real-time data. This equipment could be considered for any of the other program options.

Hire expert staff to inform best practices for water conservation and develop sound policy for the entire state. Also, hire graphic designers to represent the data visually as well as to create public outreach materials to inform about water levels.

The major challenges to this approach are:

Cost

It would require a heavy lift from the legislature to create dedicated long-term funding source. This would likely be through the Department of Ecology; however, Texas created a separate state agency under the Texas Water Development Board. A similar approach could be taken in Washington.

This would likely require support by local legislators.

Revamping the water resources approach in the state may be required.

It would not be led at the local level.

The major benefits to this approach are:

There may be federal grant funds available through the USGS or USBR to support this type of effort. This would be a much more robust effort than Option #1 in terms of what could be accomplished.

The data gathered from this option would be far more comprehensive than the first two options.

It would benefit other parts of the state.

This would allow funding for paid staff and resources.

It would satisfy DOH regulatory requirements. (Same as #1)

Other work the agency could perform would be:

Refining the understanding of which water systems are most impacted by groundwater decline.

Determine aquifer location where water is available, but there exists water quality issues that prevent it from being used for drinking water (i.e. taste & odor, temperature, contaminants, etc.).

Analyze what additional demands population growth and land use changes will place on groundwater supplies (OCR may be doing this as part of their Columbia River Demand Forecast).

Analysis of water rights seniority across the basin.

Promote educational materials for the public about the relationship between land use, water use, and economic development.

Determine possible impacts to water systems, irrigators, and the regional economy if the groundwater water is used up. What is the cost of ignoring the issue?

This approach would put Washington State alongside other national leaders in water resource management. Even if not feasible at this time, it would benefit the state to look to other leaders on this front and utilize their ideas, and implement pilot programs to illustrate how it could be done here.

Closing Observations

While the ideal program is likely a combination of these various parts, imbedded in each program is a need for continued and nearly consistent communication between 'program' staff (Ecology, Commerce, Conservation Districts, Health, etc.) to inform each other of different happenings throughout the Basin and an effort should be made to begin this information sharing. It will be interesting to see how the continued outreach of Commerce in developing a water system coalition will assist in a monitoring program. Perhaps this new entity becomes the driver of data collection and report sharing to citizens and legislators; maybe that is a key conversation point for these upcoming outreach meetings. Even if nothing is officially developed, starting the conversation with the December 10 meeting stakeholders and continuing to talk about the need for a monitoring program may in and of itself drive enough interest towards that end goal.

Appendix F: Water System Depth to Water Well Data

Sage Hills Second Water System Static Water Levels

Feb 20, 1995: 157' BGS (Well Log)

Sept 20, 2016; 198' (Air Line)

Oct 20, 2016: 202'

Apt 25, 2017: 176'

- Aug 21, 2017: 204'
- Oct 10, 2017: 186'
- Apr 1, 2018: 178'
- July 30, 2018: 197'

Jan 22, 2019: 178'

Ken Enns, Operator

		Notes	got 48.5 ft. for normal mode, got98.1 7 ft. for deep also got98.1 7 ft. for deep mode, ignore 83.5 ft. for attempting to measure below the well water level	Salinital interview interview in the activity interview in the down Salinital of the well caling had to go the well caling had to go the power cable of the gower cable with the gower cable with the gower cable with the gower cable with the gower cable with the gower cable of the gower cable of the gower cable of the gower cable of the gower cable of the gower cable of the gower cable of the gower from the gower cable of the gower cable of the gower with the gower cable of the gower set of the gower cable of the gower from the gower cable of the gower set of the gower cable of the gower set of the gower cable of the gower set of the gower cable of the gower cap well set of the gower cable of the gower cap well set of the gower cap well and gower to set of the gower to set	mode, ignore 35.0 and 50.0 ft; also got 111.2 ft. (2X response) for deep mode, ignore 83.5 ft.	unwork the Elapo Choin the north of Elapo Choin the north side of the scaling between the easing but this requires length of power calls eat the roporthe casing: since the sonic meter's since the sonic meter's socioe the sonic meter's	mode, ignore 5.43, 50.1 and 30.75, 13b 50 got ignore 33.41, (2X ignore 33.41, (2X response) for attempting neasure below the apparent waterlevel; did neasure the tappe since thouse the tetappe since thouse contracter measurements are quite Cose on the Etappe	Laike Rossewer (Lossis to becrose to kill pool at Laioft, get 55. ft. hor normal model, ginore Gas At ft. br normal mode, ginore 55. At 11, and dep mode, ginore 55. 01, and 1561.01t. for deep mode, ginore 33. 01, and	be at about full pool have be at about full pool have nonaminade, ignore 50.2 and 40.01r, alsoget 50.2 and 40.01r, alsoget ignore 54.61r, and 10.14 full de deep mode, ignore response for attemptop esponse for attemptop apparent water level; he well water level; he
		Well Water Elevatio n (feet)	1299.44	1299.44	1292.94	1292.82	1291.04	1294.34	1296.74
		Sonic Meter Time	14:48:00		16:57:00		14:58:00	16:12:00	15:58:00
		Sonic r Mete r SWL	46.6		53.1		55.0	51.7	49.3
		Sonic Meter r Depther e (feet)	al 48.5		al 55.0		al 56.9	33.6 33.6	al 51.2
		c Soni er Mete n Mod	ole norm		ole norm		or De norm	ole norm	ole norm
_		er Soni ur Mete	variat		variat		variat	variat	variat
		er Sonic Met ur Temperat e Regior	~		7		~	~	7
0106/06	6102/42	Sonic Met in Temperati	51		51		20	64	46
10		Cascadi g Water		2		8			
	5 Inc	Etape Time		15:00:00		17:02:00			
	5	Etape SWL (feet)		46.56		53.18			
-	5	Etape Depth		48.50		55.12			
2018	0107 (ment Point Height (inches	23.25	23.25	23.25	23.25	23,25	23.25	23.25
redmeno		Measure- ment Point Location	t TOCabove ground	TOC a bove ground	t TOC a bove ground	TOC a bove ground	t TOC a bove ground	t TOC a bove ground	t TOC a bove ground
2	- Ainr	Meter	Ravensga e 200U Ri	Solinst 101, P6, M2	Ravensga e 200U R(Solinst 101, P6, M2	Ravensga e 2000 Ri	Ravensga e 200U Ri	Ravensga e 2001 Ri
from		Measure- ment Type	sonic meter	Etape	sonic meter	Etape	sonic	sonic meter	sonic meter
u Hille V		Measure r	Dean White & Jared Hayes and Jamin with Iliad Water Co.	Dean White & Jared dayes and Janin Mater Co.	Dean White	Dean White	Dean White	Dean White	Dean White
or Supp		Topo Map Elevation (feet)	1346	1346	1346	1346 1346	1346	1346	1346
mante		GPS Date	7/13/2018	8107/E1//	7/13/2018	7/13/ 2018	7/13/ 2018	7/13/ 2018	7/13/ 2018
Moscire	Nicasul	Waypoin t #	441	441	441	141	41	441	441
		d Position Error (feet)	00 m	α. ri	3.8	ço m	ŝ	a m	00 11
v of Wa		UTM 11 NAD83 N	5312028	5312028	5312028	5312028	5312028	5312028	5312028
- Current		UTM 11 NAD83 E	359582	359582	359582	359582	359582	359582	359582
- 4er		PVC 1 Liner ?	2	ę	2	ę	ę	ę	e
		SWL When Drilled (feet)	a 18,99	1 12 12 12 12 12 12 12 12 12 12 12 12 12	11 48, 99	a 1 48,99	a 1 48,99	a 18 48,99	11 148,99
		Date	06/10/198 05/31/198	06/10/198 05/31/198	06/10/198 , 05/31/198	06/10/198 05/31/198	06/10/198 05/31/198	06/10/198 05/31/198	06/10/198 05/31/198
		Well Casing (Inches	و	۵	9	م	۵	م	و
		Well bepth (feet)	150	4 150	A 150	150	150	150	A 150
_		ology We D# Tag	1385, know n N	1385, n N	1385, know n N	1385, know N	1385, kn ow Z	11385, kn ow 7	1385, know n N
_		sathe Eo	ear, un	ear, 18 r 100° un	ear, 18 , hazy, un 0° F	ear, 18 .hazy, un 0°F un	arty oudy, un	artly budy, 18 asant, un ight un	ear, cool, titing 18 ider un arker un
		Start We Time	4:40:00 hot.	4:40:00	cl hot. 6:48:00 9-	.6:48:00 9.9 9.9	4;45 00 46 0 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6:06:00 Million Millio	5:50:00 da
		Well Name	Sunny Hills Group A 1	Sunny Hills Group A 1	Sunny Hills Group A 1	Sunny Hills Group A 1	Sunny Hills Group A 1	Sunny Hills Group A 1	Sunny Hills Group A 1
		Date	7/13/2018	7/13/2018	8/14/2018	8/14/2018	9/13/2018		11/8/2018

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2018	Date	Time	Level	Comments
January	6	200	241.3	• E
February	3	2:30	240.2	
March	24	2005	238.4	
April				
May	22	11:30	2387	
June	LC	2,00	238.6	
July				
August				
September	9	10:30	249.1'	
October	19	11:30	247.0	
November	20	11:30	244.5	
December	8	16:30	242'	

Well #7 Water Level Measured 3.1' Above the Floor

2018	Date	Time	Level	Comments
January	61	3:00	249.7"	
February	14	J.CO	258.2'	Doublecheelsed on the 22" at 11 258.0'
March	24	00:1	256.6	
April				
May	24	8100	25603"	
June	26	800	265'	
July	23	3:00	265.2	Pump pulled on 10th
August				
September				
October				
November	30	1100	262.6	
December	18	00:11	259.8	

Town of Lind Well 7 Water Level Report Prepared: February 22, 2019 Joseph Pessutti

Date	Static Elevation	Drawdown Elev.
08-1980	1037	95Z-
05-1983	1001-	
08-1985	1014	984-
11-1987	943	913-
08-1998 Pu	mp Lowered 40	>
07-2004	832	/
10-2013	828	1.
01-2014	880-	
05-2015 Pur	np Lowered 100	2-

Town of Lind Well 8 Water Level Report Prepared: February 15, 2019 Joseph Pessutti

Date	Static Elevation	Drawdown Elev.
10-2000	937	
2-2010	911'	883-
7-2010	903	891
9-2010	900-	875
11-2010	906-	888'
12 - 2010	907'	891-
1-2012	909	
2-2012	908-	879
41-2012	907'	882
6-2012	900	863-
7-2012	893-	858-
8-2012	891	857
9-2012	893	857
10-2012	898	865-1
11 - 2012	897'	866
1- 2013	899-	869
3-2013	901	865
4 -2013	900	861
5-2013	9001	861
6-2013	893	851
7-2013	883	845
8-2013	885	845
9-2013	886	847
10-2013	895	855-
12 - 2013	898	871'
1-2014	902	862
2-2014	898-	859-
41-2014	897	859

Page 1 of Z

Town of Lind Well 8 Water Level Report Prepared: February 15, 2019 Joseph Pessutti

Date	Static Elevation	Drawdown Elev.
6-2014	888	85z
7-2014	888	846
8-2014	889	861
10-2014		846
5-2015		847
7-2015	891	845
8-2015	888	845
9-2015	892	844
12-2015	896	857
3-2017	898-	850-
6-2018	884	831
7-2018	880-	832
8-2018	879'	832
9-2018	883-	832
1-2019	687	
-		
) ·*		r

Page Z .f Z

Appendix G: Project Articles

VOICE OF THE PROJECT | 2018 QUARTERLY NEWSLETTER | VOLUME 8, ISSUE 2

VOICE OF THE PROJECT

Supporting the Columbia Basin Project since 1964.

COLUMBIA BASIN DEVELOPMENT LEAGUE G

OUR MISSION

Serving as the voice of the Columbia Basin Project – advocating for completion and sustainable maintenance.



- UPDATE ON CRT NEGOTIATIONS
- FROM THE CHAIR
- FROM WASHINGTON TO WASHINGTON: LEAGUE REPORTS PROGRESS
- UPCOMING EVENTS
- HEALTH & COMMERCE PARTNER FOR WATER SYSTEMS
- SHARING THE COLUMBIA BASIN PROJECT STORY AT THE 2018 SANDHILL CRANE FESTIVAL
- SAILING ON THE OGWRP
- COMMISSIONER BURMAN VISITS THE COLUMBIA BASIN PROJECT

PERMIT NO. 7 CASHMERE MAILING HOUSE **UIA9 30ATZO9 2U** PRSRT STD

Cashmere, WA 98815 Str xog Od CBDF

NEARLY \$2 MILLION IN FEDERAL FUNDING **BUDGETED FOR COLUMBIA BASIN PROJECT**

n May, the League received news that the Columbia Basin Project (Project) will receive \$1.99 million in FY18 discretionary federal funding, with \$750,000 toward the Odessa Groundwater Replacement Program (OGWRP), \$650,000 toward the Potholes Supplemental Feed Route, and \$590,000 for the completion of the Pasco Pump Lateral.

What does all this mean? Well, the funding helps to ensure a more stable water supply to Potholes Reservoir by fine tuning the operation of the Supplemental Feed Route. A long-standing drainage problem in South District will be resolved through the completion of the Pasco Pump Lateral project. Continued East Low Canal expansion will be

Continued on page 2

UPCOMING EVENTS

AWARENESS DAY

/HEN: SEPTEMBER 8, 2018

QUINCY, WA

WWW.QUINCYVALLEY.ORG/FARMER-CONSUMER-AWARENESS-DAY LEARN MORE AT:

LEAGUE 54TH ANNUAL CONFERENCE

By: Ben Serr | Senior

WHEN: NOVEMBER 1, 2018

BIG BEND COMMUNITY COLLEGE MOSES LAKE, WA ATEC BUILDING

LEARN MORE AT: CBDL.ORG

contact Ben Serr at (509) 724-1699 or

, WA State Dept. of Co

HEALTH & COMMERCE PARTNER FOR WATER SYSTEMS

The Department of Health, Office of Diniking Water formed a partnership last year with the Department of Comment and Commelse initiate to work with the biolise diniking water yestems on issues related to groundwater depletion in the Mid-Columbia Basin. The area of focus includes Adams, Frankin, Grant, and Lincoln counties. More than 130 water systems in the area, serving about 32,000 relations, and Lincoln counties. More than 130 water systems in the area, serving about 32,000 relations, and Lincoln counties. More than 130 water systems in the area, serving about 32,000 relations, and Lincoln counties. More than 130 water systems for work systems for an know if or how their wells are bing affected.

Water systems can take steps to understand the status of their wells and plan ahead. The Depart-ment of Health recommends the following:

Collect water level measurements and determine the long-term trend. Understand how soon .

- Review and update your water system's emergency and water shortage response plans. Update water demands will exceed supply. •
 - Share your wells' depth-to-water data so that other systems in your area can prepare. Request all of your emergency contacts. Consider practicing your emergency procedures. •
- this information from neighboring systems. This to your costorners so that they understand how groundwater well depletion will affect them row and in the future. Let them know what emergency procedures are in place, what they must .
- do, and what it may cost. Adopt measures that enco
 - measures that encourage water use efficiency, including rebates for water-efficient fix-Establish new sources of supply by creating emergency or permanent interties. tures and a rate structure that encourages co .

resources and help of policy makers and bringing state and federal resources to the table, work can be done to increase our localized knowledge about the aquifers, and it may be possible to slow the level of decline. This One more thing water systems can do is advocate for themselves. More attention needs to be placed on understanding the aquifers that these water systems depend on. By getting the attention ent Program and expanding the East Low important. They reduce the demand being placed on these finite water is why projects like the Odessa Groundwater Replac extend their productivity into the future. Canal are

The Department of Commerce will be holding two rounds of meetings with the water systems. The first round is happening soon.

iding any of the following meetings, or have If you are interested in atte

MEETING TIMES AND LOCATIONS

STEPS TO UNDERSTAND THE STATUS OF THEIR WELLS AND WATER SYSTEMS CAN TAKE PLAN AHEAD. 7 I VOICE OF THE PROJECT NEWSLETTER

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H2Ops Article

High 5! Introducing the Columbia Basin Sustainable Water Coalition

Hats off to the folks from Health and Commerce, who in 2017 set up a partnership to help the drinking water systems facing groundwater depletion in the Mid-Columbia Basin. The area of focus includes Adams, Franklin, Grant, and Lincoln counties. Our former Eastern Regional Office Planner, Ben Serr, is working with Cathi Read and Jon Galow, from the Department of Commerce's Small Communities Initiative, to lead the outreach effort.

More than 130 Group A - Community water systems in the area, serving about 92,000 residents, rely on groundwater for their drinking water. The demand that these communities and agricultural irrigation place on the area aquifers is causing the water table to drop significantly in some areas of the basin. Many of these water systems don't know if or how their wells are affected.

The aquifers in the basin do not readily recharge because of the complex geology of the area. The Columbia Basin Ground Water Management Area (GWMA) conducted a carbon dating study of the water from 77 municipal wells and found, on average, the water was 9,200 years old with little to no recharge of the aquifers occurring. This places water systems in a predicament. They are in an area where water is being withdrawn faster than it can be replaced, they have little control over the demand placed on the aquifers, the cities and towns are economically linked to the farmers using the majority of the groundwater, and there is a lack of data for water systems to use for decision-making purposes.

The outreach work over the last 20 months includes:

- A survey of the systems
- O Analysis of existing data
- O Informational meetings for stakeholders in each of the four counties
- Presentations to the mayor's group in Lincoln county, the Eastern Washington Planners' Forum, and the Columbia Basin Development League
- O Hosting an agency meeting on long-term monitoring
- Facilitating a series meetings to form a broad-based stakeholder coalition

The coalition building meetings have been very productive. This spring, a group of stakeholders decided to create the <u>Columbia Basin Sustainable Water Coalition</u>. This is an opportunity for water systems to advocate for themselves around this issue. By getting the attention of policy makers and bringing state and federal resources to the table, the coalition can work to increase local knowledge about the aquifers and promote projects that slow the level of decline.

The coalition has established a steering committee of six members and identified the following mission:

The mission of the Columbia Basin Sustainable Water Coalition is to protect and maintain the water supply for present and future generations through active support and involvement of stakeholders to influence policy decisions and water delivery methods

Commerce will submit a final report summarizing the project, the status of ongoing local efforts, and recommendations for us before the project ends this summer.

DOH Newsletter Article

Health & Commerce Partner for Water Systems in the Mid-Columbia Basin

By Ben Serr, Senior Planner, Growth Management Services, Department of Commerce

The Department of Health, Office of Drinking Water formed a partnership in 2017 with the Department of Commerce, Small Communities Initiative (SCI) to work with water systems on groundwater depletion in the Mid-Columbia Basin (Adams, Franklin, Grant, and Lincoln counties). There are more than 130 Group A – Community water systems in the area, serving about 92,000 residents that rely on underground sources for their drinking water. Demand for groundwater also used by agricultural irrigation has caused the water table to drop significantly in some areas of the basin. Many water systems do not know if or how their wells are being affected.

The aquifers in the basin do not readily recharge because of the complex geology of the area. The Columbia Basin Ground Water Management Area (GWMA) conducted a carbon dating study of the water from 77 municipal wells and found, on average, the water was 9,200 years old with little to no recharge of the aquifers occurring. This places water systems in a predicament. They are in an area where water is being withdrawn much faster than it can be replaced, they have little control over the demand placed on the aquifers, the cities and towns are economically linked to the farmers using the groundwater, and there is a lack of data for water systems to use for decision making purposes. So what can a water system do?

There is an opportunity for water systems to advocate for themselves around this issue. By getting the attention of policy makers and bringing state and federal resources to the table, work can be done to increase our localized knowledge about the aquifers and fund projects that slow the level of decline, including the Odessa Groundwater Replacement Program and the eventual building the East High Canal, projects that were promised to local farmers to supply surface water for irrigation as part of the Columbia Basin Project (CBP).

The majority of the agricultural wells, whose water rights date back to the 1960s, were never meant to be permanent. They were a stopgap until the CBP was completed. However, build out of the project stalled in the 1970s due to funding and later, endangered species issues. Instead of phasing out groundwater usage as planned, pumping of the aquifers has been increasing for almost 50 years, resulting in groundwater declines of approximately 200 feet in some areas. Water systems have felt the effects. Some have had to lower their pumps to chase the water down their wells. Others are looking at switching to shallow sources, which require costly treatment systems. Others still are looking at using CBP water to treat and inject using aquifer storage and recovery. Unfortunately, not all of the systems impacted have clear alternatives.

In 2018, Commerce began outreach with water systems in the basin (backed by DOH funding). Former DOH ODW ERO Regional Planner, Ben Serr, now with Commerce, led the effort alongside SCI staff to

conduct a survey of the systems, analyze existing data, and facilitate outreach meetings, present to the mayor's group in Lincoln County and the Columbia Basin Development League, and host stakeholder meetings on long-term monitoring.

In 2019, efforts transitioned to support the formation of a coalition of water systems that will continue on to advocate for a solution to protect the remaining groundwater. This important work would likely require funding at the state and federal level to support education on the way water is viewed and used and fund groundwater monitoring such as a regionalized monitoring program that would provide important data for local decision making and understanding the aquifer at the regional scale. Commerce continues to work with the US Geological Survey, US Bureau of Reclamation, WA Department of Ecology, and Washington State University on this issue.

What can water systems in the Mid-Columbia Basin do now? The following approaches have been identified to help maintain source reliability:

- Collect water level measurements and determine the long-term trend. Understand how groundwater levels relate to pump levels.
- O Consider source alternatives and the costs to implement them.
- Review and update emergency and water shortage response plans. Update emergency contacts. Practice emergency procedures.
- Share depth-to-water well data to understand local trends. Request this information from neighboring systems.
- Talk to customers so that they understand how groundwater well depletion will affect them now and in the future. Let them know what emergency procedures are in place, what they must do, and what it may cost.
- Adopt measures that encourage water use efficiency, including rebates for water-efficient fixtures and a rate structure that encourages wise water choices.
- Establish new sources of supply by creating emergency or permanent interties. State financing is available for interties with nearby systems.

Commerce will submit a final report, summarizing the project, status of ongoing local efforts, and recommendations for DOH prior to the project end date of June 30, 2019. If you have questions, please contact Ben Serr at (509) 724-1699 or <u>benjamin.serr@commerce.wa.gov</u>.

Appendix H: Listing of Water Systems for Outreach

Adams County Group A - Community Water Systems Department of Commerce Survey Recipients Week of February 26, 2018

No	System ID	Water System Name
1	22525 X	ADAMS COUNTY WATER DIST #1
2	04530 N	BASIN VIEW WATER ASSOCIATION
3	52172 8	BIRD DOG FAMILY LTD PARTNERSHIP II
4	15523 2	COUNTRY LANE EAST
5	24500 Y	FAIRVIEW DOMESTIC WATER ASSN
6	89060 C	GOLDEN PLAINS MHP #1
7	31600 X	HATTON, TOWN OF
8	85203 C	HI LO HOMEOWNERS ASSN
9	32736 0	HIGHLAND ESTATES WATER SYSTEM
10	47350 8	LIND, TOWN OF
11	53190 T	MEADOW LANE WATER ASSN
12	64830 8	OTHELLO COUNTRY CLUB WATER ASSN
13	64845 3	OTHELLO MANOR WATER SYSTEM
14	64850 R	OTHELLO WATER DEPARTMENT
15	70690 A	RADAR MOBILE HOME PARK
16	70910 M	RAINIER TRACTS WATER ASSN
17	72700 8	RITZVILLE WATER DEPARTMENT
18	75200 T	SADDLE MOUNTAIN WATER ASSOC.
19	AB043 J	SCHOONOVER HUTTERIAN BRETHREN
20	72410 4	SECT 11 DIV 1 RIDGEVIEW WATER ASSN
21	83116 X	SPORTSMAN TRAILER PARK
22	07764 Y	STAHL HUTTERIAN BRETHREN
23	85080 M	SUMMERSET WEST WATER ASSOCIATION
24	85201 B	SUNBURST ESTATES WATER ASSN
25	85950 1	SUNSET ACRES WATER ASSOCIATION
26	92829 L	WARDEN HUTTERIAN BRETHREN 1
27	93450 9	WASHTUCNA WATER DEPARTMENT
28	94910 Y	WEST SIDE MOBILE COURT

Franklin County Group A - Community Water Systems Department of Commerce Survey Recipients Week of February 26, 2018

No	System ID	Water System Name
1	04461 U	BASIN CITY WATER SEWER DISTRICT
2	AB809 G	CLARK ADDITION WATER SYSTEM
3	13550 5	CLEARWATER DOMESTIC WATER ASSN
4	14600 2	CONNELL, CITY OF
5	15461 X	CYPRESS COUNTRY ESTATES
6	23240 J	ELTOPIA WATER ASSOCIATION
7	37400 2	KAHLOTUS, CITY OF
8	17189 A	KEPPS ACRES ASSOCIATION
9	45800 F	LANDOWNERS WATER ASSOCIATION
10	54100 J	MESA WATER DEPARTMENT
11	10761 0	NORTH SLOPE ESTATES PROPERTY
12	66350 8	PASCO HEIGHTS DOMESTIC WATER ASSN
13	11901 R	RADAR HILL WATER SYSTEM
14	72500 0	RINGOLD DOMESTIC WATER CORP
15	38792 V	RIVER RIDGE ESTATES
16	76750 T	SCOOTENAY WATER ASSN INC
17	13451 J	SUNRISE ESTATES WATER SYSTEM
18	86100 R	SUNSET DOMESTIC WATER ASSN
19	94650 L	WEST 15 DOMESTIC WATER ASSN
20	94830 B	WEST MESA DOMESTIC WATER ASSN
21	96100 T	WHITE BLUFF WATER ASSOCIATION

Grant County Group A - Community Water Systems Department of Commerce Survey Recipients Week of February 26, 2018

No	System ID	Water System Name
1	34544 3	ADMIRAL WATER USERS ASSN
2	04600 1	BASIN WATER SOURCES INC
3	06350 2	BEVERLY WATER DISTRICT
4	11500 Q	CASCADE VALLEY WATER DISTRICT
5	11488 T	CASCADE VILLAGE MHP
6	AB548 4	COUGAR CAMPERS
7	15300 Q	COULEE CITY, TOWN OF
8	18189 C	COUNTRY CLUB ESTATES WATER SYSTEM
9	06456 9	COUNTRY CORNER MOBILE HOME PARK
10	15950 T	CRESCENT BAR SYSTEM
11	03129 F	CRESCENT VIEW CONDOMINIUM OWNERS
12	19056 0	DESERT AIRE OWNER ASSN
13	19068 9	DESERT VILLA
14	06536 W	DIAMOND POINT WATER SYSTEM
15	22850 H	ELECTRIC CITY, CITY OF
16	23650 A	EPHRATA WATER DEPARTMENT
17	25250 X	FIRST POTHOLES WATER USERS ASSN
18	25800 D	FORDAIR WATER CO-OP INC
19	27395 T	GEORGE, CITY OF
20	28400 3	GOLDEN VALLEY WATER ASSN
21	28700 F	GRAND COULEE WATER DEPT, CITY OF
22	08520 N	GROVE TERRACE MHP TWO, LLC
23	31500 T	HARTLINE WATER SYSTEM
24	33200 J	HILLCREST WATER USERS ASSN
25	45312 4	LAKEVIEW MOBILE TERRACE
26	45350 4	LAKEVIEW PARK WATER ASSN
27	51724 P	MARINE VIEW HOME OWNERS ASSN
28	AA503 N	MARLIN HUTTERIAN
29	52000 9	MATTAWA, CITY OF
30	05848 H	MEADOW PARK WATER SYSTEM
31	56300 X	MOSES LAKE, CITY OF
32	57000 L	MT VIEW WATER SYSTEM
33	03370 C	NORTH SHORE ACRES
34	64080 H	ORCHARD HOMES WATER SYSTEM
35	AC008 G	OUTLAW CAMP
36	65640 A	PAINTED HILLS WATER ASSOCIATION
37	22881 T	PARKER SPRING ACRES WATER ASSOC
38	66800 L	PELICAN POINT WATER COMPANY

39	68420 Q	PONDEROSA MOBILE HOME PARK
40	39424 R	QUAIL RUN MOBILE HOME PARK
41	01639 8	QUINCY VALLEY ADULT PARK
42	70450 1	QUINCY WATER DEPARTMENT, CITY OF
43	03912 M	RIDGEVIEW ESTATES WATER ASSOCIATION
44	74700 C	ROYAL CITY WATER
45	00543 7	ROYAL WATER DISTRICT
46	01371 R	SAGE HILLS ESTATES 1
47	04398 3	SAGE HILLS SECOND WATER SYSTEM
48	AC812 P	SAGEDALE APARTMENTS
49	76620 W	SENTINEL GAP WATER ASSN
50	02345 4	SILVER SANDS CONDO WATER
51	80200 H	SKYLINE ACRES INC
52	AB958 E	SKYLINE EAST ORCHARD
53	80210 R	SKYLINE WATER SYSTEM INC
54	81300 P	SOAP LAKE WATER DEPT
55	07542 5	STRATFORD ROAD ESTATES
56	19936 M	SUN DESERT INC
57	AD198 D	SUN VALLEY ORCHARD FARMWORKER
58	85240 V	SUNLAND ESTATES HOMEOWNERS ASSN
59	16177 Y	SUNRISE WATER ASSOCIATION
60	AA745 A	SUNSERRA AT CRESCENT BAR
61	85940 R	SUNSET ACRES WATER ASSN
62	AC293 G	T-11 FARMWORKER HOUSING
63	19208 0	VIKING ROAD WATER SYSTEM
64	AB465 H	W&L ORCHARDS
65	08131 X	WAGON WHEEL MHP
66	29082 Q	WANAPUM VILLAGE
67	92850 Q	WARDEN, CITY OF
68	94110 X	WEILER-MARTIN TRACTS WATER ASSN
69	95240 W	WESTMONT ACRES
70	56143 8	WESTSHORE WATER COMPANY
71	AC660 4	WHISPERING ROCK FARMWORKER HOUSING

Lincoln County Group A - Community Water Systems Department of Commerce Survey Recipients Week of February 26, 2018

Number	System ID	Water System Name
1	01700 Y	ALMIRA WATER SYSTEM
2	04298 Y	COLUMBIA SPRINGS ESTATES
3	16150 U	CRESTON PUBLIC WATER
4	18100 N	DAVENPORT WATER DIVISION
5	01852 D	DEER MEADOWS WATER COMPANY INC
6	22550 4	EDWALL WATER ASSN
7	19928 D	HANSON HARBOR HOMEOWNERS ASSN
8	31450 Y	HARRINGTON, CITY OF
9	45366 F	LAKEVIEW TERRACE MHP
10	63050 N	ODESSA
11	71550 7	REARDAN, TOWN OF
12	47283 E	ROOSEVELT LAKE RANCH
13	77651 8	SEVEN BAYS ESTATES UNLIMITED
14	83150 V	SPRAGUE, CITY OF
15	23391 F	SUNNYHILLS
16	96800 P	WILBUR, TOWN OF

Appendix I: DOH Strategy for Municipal Water Supplies in the Columbia Basin & DOH Pubs.

DOH Strategy for Ensuring Reliable Long-Term Municipal Water Supplies in the Columbia Basin

A recent study completed by the <u>Columbia Basin Ground Water Management Area</u> (GWMA) highlights the potential for significant declining groundwater supplies for many municipalities in Adams, Franklin, Grant and Lincoln Counties. The October 2012 study identified current and future water supply conditions for 124 wells owned by 25 different water systems in the basin. According to the study, at least half of them will likely not meet their future water needs, eight of them by 2030 (including Moses Lake).

Since many of the municipalities may be facing a water supply crisis during the coming decades, the study suggests possible long-term water supply options tailored for each municipality and identifies some of the pros and cons of each. For many municipalities, the study suggests eliminating utilization of the deep basalt aquifer system which is experiencing rapidly declining water levels and moving their water supply to one of the more sustainable water supply options:

- More shallow aquifer(s) OR
- Surface water.

The declining water supplies in the area could be a substantial public health problem if not addressed with diligence. This will have big impacts on not just one or two water systems, but potentially a large number of communities. We recognize that each municipality is unique and solutions must be tailored accordingly. It is the responsibility of the municipalities to identify and implement solutions.

Through coordination and cooperation with GWMA staff and the Office of Columbia River (OCR), we have an opportunity to provide technical assistance to these communities as they plan for the development of long-term solutions for a more sustainable water supply in the future.

Assuming the Legislature continues to fund the declining water supply in the Odessa area, it is estimated that OCR has \$32M to fund construction projects and mitigation activities. Some of that funding may be used to assess and mitigate the municipalities' declining water supply and has support from OCR and their policy advisory group.

Office of Drinking Water's Role

Vision: Consistent with our mission to ensure reliable water supplies, we are committed to providing targeted planning assistance to municipalities affected by declining groundwater supplies in the Columbia Basin supplies now and for the long-term.

Our goal: To help municipalities that are facing water supply challenges plan for a more reliable future water supply.

How we will achieve our goal

We anticipate using the information presented in the study to begin a dialogue with these municipalities about their ability to meet current and future potable water needs. The following strategies will contribute to achieving our goal:

1. Implement the appropriate level of planning tailored for each water system facing a water supply crisis. This may include placing more emphasis on and comprehensive review of:

- o 20-year planning efforts.
- Water use efficiency programs.
- Water shortage response plans.
- o CIP long-term investments that seek out a more reliable supply of water.
- Reclaimed water for non-potable needs.
- 2. Encourage regional solutions where possible, and suggest possible partnership frameworks for municipalities to use to coordinate with each other.
- 3. Use ODW's alternative water supply papers to guide our decision making, in the event that alternative water supplies are considered (such as trucking water).
- 4. Use our capacity program to assess technical, managerial and financial health.

Near-Term Activities (2013-15 Biennium)

We anticipate using OCR funding to help pay for or fully fund these activities:

- Hold an "open house" event with all 25 municipalities, DOH, OCR, the GWMA team and the Spokane Joint Aquifer Board (if interested) to discuss the GWMA report, gauge level of awareness about the problem and share a vision for what to do next.
- Develop a standard questionnaire/survey to be sent to all affected municipalities to assess
 their level of risk. The risk assessment would be combined with information from the
 region and GWMA report to target our level of outreach and technical assistance for each
 municipality.
- Suggest that OCR hire a consultant to help municipalities develop an outreach strategy to inform the public about the water supply challenges.

Install water level measuring devices to monitor declining water levels in wells throughout the basin. Installation and recording/reporting of data from these devices will be coordinated through OCR.

 Request letter from agency leaders outlining support and commitment to coordination with municipalities in their effort to secure a reliable future water supply.

Short-Term Activities (2013-18)

We will use the information collected from the near-term activities to achieve 5-year short-term goals (2013-18):

- Use survey results to target planning needs for each municipality.
- Use water level data collected from wells to assess rate of decline.
- Begin to identify potential new water sources.
- Identify OCR funding options for municipalities to complete water system plans that incorporate strategies that will provide reliable future water supply.
- Request OCR funding to hire a project planner position to help municipalities take the next step in ensuring a reliable future water supply.
- Collaborate with OCR and municipalities in identifying and pursuing funds to implement strategies reflected in plans.

Long-Term Activities (2018-2030)

Our general focus will emphasize using our existing planning process to ensure that the most vulnerable affected water systems prioritize the development of long-term water supply solutions.

Staff Impacts

- 1. This work will be led primarily out of HQ by Mike Dexel (DOH representative for OCR advisory group), with limited assistance by Ginny Stern.
- 2. Eastern Regional Office planners and engineers will provide much support and onground implementation.
- 3. Explore hiring project planner through OCR funding program to assist with the specific regional planning emphasis, complexity and overall workload.

Next Steps

- 1. Mike will contact Derek Sandison at OCR to review some of the ideas proposed in this discussion paper.
- 2. Mike will work with ERO to develop a more detailed implementation workplan outlining roles and responsibilities along with timelines for completion.
- 3. ERO and Mike, in consultation with GWMA, will begin to identify some of the key questions that we think should be asked in the survey tool.



Measuring water levels in wells

It is important to measure the water level in your wells on a regular basis. Doing so will allow you to identify and diagnose well-production issues long before they cause serious problems such as water outages and pump damage. Besides, state drinking water rules require all water systems to maintain records of static well-water levels on a seasonal basis, including low demand and high demand periods (WAC 246-290-415(9)).

Issues that cause reduced well production include:

- Bacterial growth or mineral encrustation that plug well casing slots or screens.
- Over-pumping or drought conditions that cause a regional drop in the aquifer level.
- Problems with the operation of the well pump or pump motor.

If a utility does not track water level data over time and well production drops dramatically, the contractor hired to fix the well can only guess the nature of the underlying problem. Guesswork often leads to money wasted on a trial-and-error approach to rehabilitating the well.

The right time to measure the well water level

Measure the **static water level** and the **pumping water level** weekly during the highest water use times of the year, and at least monthly during the rest of the year. Collecting this data over a number of years will reveal any seasonal variations to water levels in the aquifer, and show trends on how the well performs when the pump is running the most.

- **Pumping water level** is the depth of the water in the well when the pump is on.
- Static water level is the depth of the water in the well when the pump is off long enough for the aquifer to return to its normal level. A good time to measure static water level is early in the morning before customers use much water. Surrounding water uses and seasonal weather patterns affect the static water level.

A drop in the pumping water level when there is no drop in the static level may reveal the well is not allowing water in. This could mean the slots or screen are plugged. A lower discharge rate from the pump and a higher pumping water level could mean a problem with the pump.



Todd Shepherd, water quality specialist for Tacoma Water, uses an electric water level probe to measure the water level in Well 6B. Photo courtesy of Tacoma Water.


What to do if you are losing pumping capacity from the well

- Inform your customers. If necessary, implement a water conservation plan to decrease usage.
- Hire a licensed well driller or pump contractor to give you a professional assessment of the severity of the problem.
- Contact the local health department and the Office of Drinking Water. Ask for information about emergency sources of water.
- Take precautions if the pump is drawing air into the system. This may mean the water level dropped (at least for a little while) below the pump intake. Pumping too much air for too long can burn out a pump. If the pump circuit breaker repeatedly trips, this may also indicate that the pump has overheated from pumping air.

Ways to measure the water level

Air Line Device



Example: If the open end of an installed air tube is 300 feet below the top of the well casing and the pressure gauge reads 38 psi, the water level depth would be 213 feet below the top of the well casing.

300 feet - (38 psi x 2.31 ft/psi) = 213 feet

Air Line Device

Electric Water Level Probes

Electric water level probes consist of a spool of dual conductor wire, a probe attached to the end and an indicator. When the probe contacts the water, the circuit closes and a meter light or audible buzzer attached to the spool signals contact. Read the depth from graduated markings on the wire.

Remember to:

- Disinfect the measuring device with a dilute chlorine bleach solution before using it to prevent contaminating your well. Make sure the instrument is working by dipping the probe into a bucket of clean water.
- Slowly lower the probe down the well casing. If the probe gets caught up on wires, pipes or other material in the well, pull back and try again. You may need to try several times before finding a free path down to the water.



Electric Water Level Probe

- If the probe gets stuck, leave it hanging in place. Don't cut it off and let it fall into your well because it could damage the pump. Tie the measuring probe securely to the top of the wellhead and retrieve it next time you pull the pump out for maintenance or repair.
- When the electronic indicator light or buzzer signals that you've reached the water, mark the cable at the top of the well casing, and record the depth-to-water results.

Pressure Transducers

Pressure transducers are submersible sensors that measure the pressure of the column of water above them in the well and send information to above ground data loggers. They continuously record water levels.

Sonic Well Sounders

Sonic well sounders use sound waves to measure the depth to water level by bouncing sound waves off the surface of the water. Sonic well sounders are simple to use and provide instant data. There is no risk of contaminating the well because nothing touches the water and there are no probes or wires to hang up.

Wetted Steel Tapes

You can measure the depth of water by lowering a wetted steel tape to into the well until the lower part of the tape is under water. A chalk coating on the last few feet of tape indicate the exact water level. When you remove the tape from the well, you can read the depth of the water directly from the dry length of tape.



For more information:

Call the Office of Drinking Water at 800-521-0323 or the:

- Southwest Region, Tumwater 360-236-3030
- Northwest Region, Kent 253-395-6750
- Eastern Region, Spokane 509-329-2100

Visit the following Web sites:

Department of Health, Office of Drinking Water: http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater

Department of Ecology for well logs: http://www.ecy.wa.gov/programs/wr/wells/wellhome.html

Department of Ecology publication: Focus on Water Well Collection: How to properly collect & document water level data from your well (ECY 14-11-004)



For people with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TDD/TTY call 711).

- 3 -



Questions & Answers

Mid-Columbia Basin

Protecting your system and your community by monitoring well water levels.

It is important to understand changes in underground water sources in the Mid-Columbia Basin area. Insufficient water may have serious results on public health and the economic health of cities and towns in the area. There are things you can do to prepare.

Where is the Mid-Columbia Basin Groundwater Management Area?

The Mid-Columbia Groundwater Management Area takes in most of Adams, Franklin, Grant, and Lincoln counties. A loss of available groundwater may affect dozens of cities and towns, nearly 100 community water systems, and many other smaller public and private water systems.

What is happening?

Most public water systems in the area take their water from underground water sources. Some of these sources are thousands of years old and do not refill by rain or streams. Others contain younger water, but refill so slowly that water is used faster than it is replaced.



How do we know what is happening in our well?

Some water systems have seen drops in their well water level through regular measurements. In cases where water level measurements aren't taken, wells that are consistent for many years, suddenly are unreliable, because water levels dropped so much.

Are Group A water systems required to measure water levels?

All groundwater systems must measure the static water level on a seasonal basis, including low and high demand periods; please see WAC 246-290-415(9). You must keep a record of the measurements and provide it to us on request. Please see *Measuring Water Levels in Wells* (331-428)* for more information.

What will happen if my water system doesn't measure depth to water?

Systems that don't measure water levels won't be prepared when the well runs dry, causing substantial operational, managerial, and financial challenges. When you measure water levels you understand your well conditions and can plan for your needs rather than suffer a catastrophic, even permanent, loss of water.



How can I determine the risk of water depletion for my water system?

There are many risk factors, some that you can control. Your level of risk increases if:

- Your system has only one source.
- Your well operates using junior water rights, which may have restrictions.
- You have not measured depth-to-water since the well was first constructed.
- The water level in any of your wells drops by more than five feet per year.
- The water level is predicted to drop below the bottom of the well in the next 20 years.
- Your system as a whole lacks the capacity to satisfy demand in the next 20 years.
- Your system does not measure water levels at least four times per year.
- Other systems in your area have experienced well failure or decreased capacity.
- You have added new wells to maintain your supply volume.
- You have deepened your wells in the past.
- Your well's depth-to-water is greater than 750 feet.
- You do not have enough information to know whether you have these risk factors.

Can't I just truck water from somewhere else?

You cannot use trucked water as a permanent source of supply. You may truck water only for temporary, emergency situations. Call our Eastern Regional Office at 509-329-2100 or see *Truck Transportation* (331-063)* for more information.

How can my water system prepare for groundwater source depletion?

You should prepare for groundwater source depletion by carrying out the following tasks:

- Collect water level measurements and determine the long-term trend. Understand how soon water demands will exceed supply.
- Review and update your water system's emergency response plan. Update all of your emergency contacts. Consider practicing your emergency procedures.
- Share your well's depth-to-water data so that all of your area's systems can prepare. Request this information from neighboring systems.
- Talk to your customers so that they understand how groundwater well depletion will affect them now and in the future. Let them know what emergency procedures are in place, what they must do, and what it may cost.
- Adopt measures that encourage water use efficiency, including rebates for water-efficient fixtures and a rate structure that encourages wise water choices.
- Establish new sources of supply by creating emergency or permanent interties. Ask your regional planner what state financing is available for interties with nearby systems.

For more information:

Call your ODW regional office.

Eastern Region: Spokane Valley 509-329-2100

*Our publications are online at

http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/PublicationsandForms

For people with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TDD/TTY call 711).

Appendix J: DOH Contract



CONTRACT	NUMBER:
CVS22068	

SUBRECIPIENT *

INTERAGENCY AGREEMENT Between STATE OF WASHINGTON DEPARTMENT OF HEALTH And DEPARTMENT OF COMMERCE

THIS AGREEMENT is made by and between the State of Washington Department of Health, hereinafter referred to as DOH, and the State of Washington Department of Commerce, hereinafter referred to as Contractor pursuant to the authority granted by Chapter 39.34 RCW.

PURPOSE: The purpose of this contract is to provide education and outreach to impacted Group A Water System customers in the Mid-Columbia Basin to help organize and communicate efforts and plans regarding current and future water supply conditions.

THEREFORE, IT IS MUTUALLY AGREED THAT:

STATEMENT OF WORK AND BUDGET: The Contractor shall furnish the necessary personnel, equipment, material and/or services and otherwise do all things necessary for or incidental to the performance of the work set forth in Exhibit A, attached hereto and incorporated herein.

PERIOD OF PERFORMANCE: Subject to its other provisions, the period of performance of this Agreement shall commence on **the Date of Execution** and be completed on **June 30, 2019**, unless terminated sooner as provided herein. Any work done outside of the period of performance shall be provided at no cost to DOH.

FEDERAL FUNDING ACCOUNTABILITY AND TRANSPARENCY ACT (FFATA): If checked above, this Agreement is supported by federal funds that require compliance with the Federal Funding Accountability and Transparency Act (FFATA or the Transparency Act). The purpose of the Transparency Act is to make information available online so the public can see how federal funds are spent.

To comply with the act and be eligible to enter into this Agreement, your organization must have a Data Universal Numbering System (DUNS®) number. A DUNS® number provides a method to verify data about your organization. If you do not already have one, you may receive a DUNS® number free of charge by contacting Dun and Bradstreet at <u>www.dnb.com</u>.

Information about your organization and this Agreement will be made available on <u>www.USASpending.gov</u> by DOH as required by P.L. 109-282. DOH's form, Federal Funding Accountability and Transparency Act Data Collection Form, is considered part of this Agreement and must be completed and returned along with the Agreement.

PAYMENT: Compensation for the work provided in accordance with this Agreement has been established under the terms of RCW 39.34.130. The parties have estimated that the cost of accomplishing the work herein **will not exceed \$217,000** in accordance with Exhibit A, attached hereto and incorporated herein. Compensation incudes but is not limited to all taxes, fees, surcharges, etc. Payment will not exceed this amount without a prior written amendment. DOH will authorize payment only upon satisfactory completion and acceptance of deliverables and for allowable costs as outlined in the statement of work and/or budget.

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Source of Fu	10S:							
Federal:	\$217,000	State:	\$0	Other	: \$0	0	TOTAL	\$217,000

Contractor agrees to comply with applicable rules and regulations associated with the federal funds.

BILLING PROCEDURE: Payment to the Contractor for approved and completed work will be made by warrant or account transfer by DOH within 30 days of receipt of the invoice. Upon expiration of the Agreement, any claim for payment not already made shall be submitted within 60 days after the expiration date or the end of the fiscal year, whichever is earlier.

AGREEMENT ALTERATIONS AND AMENDMENTS: This Agreement may be amended by mutual agreement of the parties. Such amendments shall not be binding unless they are in writing and signed by personnel authorized to bind each of the parties.

ASSIGNMENT: The work to be provided under this Agreement, and any claim arising thereunder, is not assignable or delegable by either party in whole or in part, without the express prior written consent of the other party, which consent shall not be unreasonably withheld.

CONFIDENTIALITY/SAFEGUARDING OF INFORMATION: The use or disclosure by any party of any information concerning a client obtained in providing service under this Agreement shall be subject to Chapter 42.56 RCW and Chapter 70.02 RCW, as well as any other applicable Federal and State statutes and regulations.

Any unauthorized access or use of confidential information must be reported to the DOH IT Security Officer at (360) 236-4432. The notification must be made in the most expedient time possible (usually within 24 hours of discovery) and without unreasonable delay, consistent with the legitimate needs of law enforcement, or any measures necessary to determine the scope of the breach and restore the reasonable integrity of the data system.

CONTRACT MANAGEMENT: The contract manager for each of the parties shall be responsible for and shall be the contact person for all communications and billings regarding the performance of this agreement.

The Contr	act Manager for DOH is:	The Contract Manager for the Contractor is:		
Name:	Arlene Hyatt	Name:	Cathi Read	
Office:	Office of Drinking Water	Title:	Commerce Specialist	
Agency:	Department of Health	Agency:	Department of Commerce	
Address:	PO Box 47822	Address:	PO Box 42525	
State Zip	Olympia, WA 98504-7822	City State Zip:	Olympia, WA 98504-2525	
Phone:	(360) 236-3131	Phone:	(360) 725-3016	

DISPUTES: In the event that a dispute arises under this Agreement, it shall be determined by a Dispute Board in the following manner: Each party to this agreement shall appoint one member to the Dispute Board. The members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, Agreement terms and applicable statutes and rules and make a determination of the dispute. The determination of the Dispute Board shall be final and binding on the parties hereto. As an alternative to this process, either of the parties may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control.

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GOVERNANCE: This Agreement is entered into pursuant to and under the authority granted by the laws of the State of Washington and any applicable federal laws. The provisions of this Agreement shall be construed to conform to those laws.

In the event of an inconsistency in the terms of this Agreement, or between its terms and any applicable statute or rule, the inconsistency shall be resolved by giving precedence in the following order:

- A. Federal statutes and regulations
- B. State statutes and regulations
- C. Agreement amendments
- D. The Agreement (in this order)
 - 1. Primary document (document that includes the signature page)
 - 2. Statement of Work (Exhibit A)

INDEPENDENT CAPACITY: The employees or agents of each party who are engaged in the performance of this Agreement shall continue to be employees or agents of that party and shall not be considered for any purpose to be employees or agents of the other party.

PRIVACY: Personal information collected, used or acquired in connection with this Agreement shall be used solely for the purposes of this Agreement. Contractor and its subcontractors agree not to release, divulge, publish, transfer, sell or otherwise make known to unauthorized persons personal information without the express written consent of the agency or as provided by law. Contractor agrees to implement physical, electronic and managerial safeguards to prevent unauthorized access to personal information.

DOH reserves the right to monitor, audit or investigate the use of personal information collected, used or acquired by the Contractor through this Agreement. The monitoring, auditing, or investigating may include but is not limited to "salting" by DOH. Contractor shall certify the return or destruction of all personal information upon expiration of this Agreement. Salting is the act of placing a record containing unique but false information in a database that can be used later to identify inappropriate disclosure of data contained in the database.

Any breach of this provision may result in termination of the Agreement and the demand for return of all personal information. The contractor agrees to indemnify and hold harmless DOH for any damages related to the Contractor's unauthorized use of personal information.

RECORDS MAINTENANCE: The parties to this Agreement shall each maintain books, records, documents and other evidence which sufficiently and properly reflect all direct and indirect costs expended by either party in the performance of the services described herein. These records shall be subject to inspection, review or audit by personnel of both parties, other personnel duly authorized by either party, the Office of the State Auditor, and federal officials so authorized by law. All books, records, documents, and other material relevant to this Agreement will be retained for six years after expiration and the Office of the State Auditor, federal auditors, and any persons duly authorized by the parties shall have full access and the right to examine any of these materials during this period.

Records and other documents, in any medium, furnished by one party to this Agreement to the other party, will remain the property of the furnishing party, unless otherwise agreed. The receiving party will not disclose or make available this material to any third parties without first giving notice to the furnishing party and giving it a reasonable opportunity to respond. Each party will utilize reasonable security procedures and protections to assure that records and documents provided by the other party are not erroneously disclosed to third parties.

RIGHTS IN DATA: Unless otherwise provided, data, which originates from this Agreement shall be "works for hire" as defined by the U.S. Copyright Act of 1976 and shall be owned by DOH. Data shall include, but not be limited to, reports, documents, pamphlets, advertisements, books magazines, surveys,

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studies, computer programs, films, tapes, and/or sound reproductions. Ownership includes the right to copyright, patent, register, and the ability to transfer these rights.

SEVERABILITY: If any provision of this Agreement or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Agreement which can be given effect without the invalid provision, if such remainder conforms to the requirements of applicable law and the fundamental purpose of this Agreement, and to this end the provisions of this Agreement are declared to be severable.

SUBCONTRACTING: Neither the Contractor, nor any subcontractors, shall enter into subcontracts for any of the work contemplated under this agreement without prior written approval of DOH. In no event shall the existence of the sub operate to release or reduce the liability of the Contractor to DOH for any breach in the performance of the contractor's duties. This clause does not include contracts of employment between the contractor and personnel assigned to work under this Agreement.

Additionally, the Contractor is responsible for ensuring that all terms, conditions, assurances and certifications set forth in this Agreement are carried forward to any subcontracts. Contractor and its subcontractors agree not to release, divulge, publish, transfer, sell or otherwise make known to unauthorized persons personal information without the express written consent of DOH or as provided by law.

If, at any time during the progress of the work, DOH determines in its sole judgment that any subcontractor is incompetent, DOH shall notify the Contractor, and the Contractor shall take immediate steps to terminate the subcontractor's involvement in the work. The rejection or approval by DOH of any subcontractor or the termination of a subcontractor shall not relieve the Contractor of any of its responsibilities under the Agreement, nor be the basis for additional charges to DOH.

SUSPENSION OF PERFORMANCE AND RESUMPTION OF PERFORMANCE: In the event contract funding from State, Federal, or other sources is withdrawn, reduced, or limited in any way after the effective date of this Agreement and prior to normal completion, DOH may give notice to Contractor to suspend performance as an alternative to termination. DOH may elect to give written notice to Contractor to suspend performance when DOH determines that there is a reasonable likelihood that the funding insufficiency may be resolved in a timeframe that would allow performance to be resumed prior to the end date of this Agreement. Notice may include notice by facsimile or email to Contractor's representative. Contractor shall suspend performance on the date stated in the written notice to suspend. During the period of suspension of performance each party may inform the other of any conditions that may reasonably affect the potential for resumption of performance.

When DOH determines that the funding insufficiency is resolved, DOH may give Contractor written notice to resume performance and a proposed date to resume performance. Upon receipt of written notice to resume performance, Contractor will give written notice to DOH as to whether it can resume performance, and, if so, the date upon which it agrees to resume performance. If Contractor gives notice to DOH that it cannot resume performance, the parties agree that the Agreement will be terminated retroactive to the original date of termination. If the date Contractor gives notice it can resume performance is not acceptable to DOH, the parties agree that the Agreement will be terminative date is not acceptable to DOH, the parties agree that the Agreement will be terminated retroactive to the original date of termination.

TERMINATION: Either party may terminate this Agreement upon 30 days prior written notification to the other party. If this Agreement is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Agreement prior to the effective date of termination.

TERMINATION FOR CAUSE: If for any cause, either party does not fulfill in a timely and proper manner its obligations under this Agreement, or if either party violates any of these terms and conditions, the aggrieved party will give the other party written notice of such failure or violation. The responsible party will be given the opportunity to correct the violation or failure within 15 working days. If the failure

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or violation is not corrected, this Agreement may be terminated immediately by written notice of the aggrieved party to the other.

WAIVER: A failure by either party to exercise its rights under this Agreement shall not preclude that party from subsequent exercise of such rights and shall not constitute a waiver of any other rights under this Agreement unless stated to be such in a writing signed by an authorized representative of the party and attached to the original Agreement.

ALL WRITINGS CONTAINED HEREIN: This Agreement contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the parties hereto.

IN WITNESS WHEREOF, the parties have executed this Agreement.

CONTRACTOR SIGNATURE	DATE
Munh	10/19/2017
PRINT OR TYPE NAME AND TITLE	
MAMILIE. Bronkley	Assistant Director
DOH CONTRACTING OFFICER SIGNATURE	DATE
De Labley	Contract Specialist
This contract has been approved	as to form by the attorney general.

RECEIVED

OCT 1 9 2017

DOH Contracts Office

DOH Contract GVS23068

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EXHIBIT A STATEMENT OF WORK DOH CONTRACT GVS23068 DEPARTMENT OF COMMERCE DATE OF EXECUTION THROUGH JUNE 30, 2019

	Date of Execution –	June 30, 2019	1
DOH Contract GVS23068	Mid-Columbia Resiliency Coordination	Budget for this Task: \$	217,000
	Description and Objectives		Staff Allocations
Declining aquifers threat. An October 2012 study id study, at least half of tho Resiliency Coordination p and help the systems org Objectives of this project 1. Provide a constru- impact it has on t Management Are 2. Communicate iss 3. Promote regiona 4. Collaborate with 5. Identify gaps and 6. Encourage regior 7. Provide a facilitat This effort is consistent w water.	en the reliability of at least 116 Group A - Community wate lentified current and future water supply conditions for 25 se systems will be unable to meet future water needs, eigh iroject will provide education and outreach to the potential anize and communicate their current efforts and future pla t: tictive and coordinated voice for the water utilities in comm these communities with stakeholders such as the Office of t a, Departments of Agriculture and Ecology, the agricultura ues specific to the water utilities to the stakeholder groups I partnership building. Impacted communities to identify the pros/cons of using d needs in current data gathering efforts. I al solutions and suggest possible partnerships to improve to for community meetings and workgroups. with the Capacity Development Strategy to ensure a safe an	r systems serving the Mid-Columbia Basin. of those water systems. According to that t of them by 2030. The Mid-Columbia lly impacted systems and their customers, ins. hunicating the issue facing the region and the the Columbia River, the Groundwater I community, and the region's consumers. ifferent water sources. coordination and success. d reliable supply of high quality drinking	The program tasks will be performed by existing Commerce staff in the Small Communities Initiative (SCI) and Growth Management Services (GMS) with appropriate expertise and skills to accomplish program objectives and outcomes.
	Specific Outputs ar	nd Outcomes	
			CE Company on the Environment of the Market Action of the Market Action of the State of the Company of the State of the

.

Strengthened, more effective partnerships between utilities, decision-makers, regulators, stakeholders, and technical assistance providers. Improved participation of the small communities in the larger conversation and improved understanding of the extent of the issues by all stakeholders. Improved managerial and technical capacity of impacted utilities. :

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EXHIBIT A STATEMENT OF WORK DOH CONTRACT GVS23068 DEPARTMENT OF COMMERCE DATE OF EXECUTION THROUGH JUNE 30, 2019

Small systems that are better prepared to scope the extent of the issue, develop water shortage response plans, collaborate with other stakeholders to develop regional water supply strategies for economic development and comprehensive planning, and collaborate with other stakeholders to develop a regional plan to address groundwater preservation.

Deliverables	Deliverable Due Dates
Meeting notes and agendas from all facilitated meetings.	Due with following quarterly report
Create an easy to use template/spreadsheet for recording water level data and provide to the impacted water syste	ems. Due with following quarterly report
 Letters of support for regional cooperation, awareness of the issues, and locally- and regionally-implementable activ (if these can be obtained from the stakeholders). 	vities Due upon contract completion
Survey results from questionnaires sent to all impacted systems.	Due upon contract completion
 Quarterly reports describing all work performed under the contract with all work produced that quarter. 	
 Lists of affected water systems that have produced, or are producing, planning documents designed to respond to water supply challenges, such as water shortage response programs, water use efficiency programs, water supply pl and comprehensive plans. 	lans, Due with following quarterly report
 Final report to include: All available data. Expressions of support & awareness of affected communities, regional committees, and boards. A summary report for each water system to include findings and recommendations based on questionnaire and interviews. Consideration of Potential regionalization efforts as a resiliency tool. Efforts made toward creation of a regional plan/strategy prepared by impacted systems, with recommendations for next steps. 	Due within 60 days of contract completion

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MID-COLUMBIA RESILIENCY COORDINATION: FINAL REPORT 2019

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EXHIBIT A STATEMENT OF WORK DOH CONTRACT GVS23068 DEPARTMENT OF COMMERCE **DATE OF EXECUTION THROUGH JUNE 30, 2019**

Approach Assess the current level of understanding and participation of the impacted communities via questionnaire, meetings, planning documents and interviews

- Attend and facilitate local meetings and assist in the formation of regional groups and committees that involve the impacted communities to increase awareness, improve opportunities to seek funding assistance, and address planning goals.
- Work with the identified communities and other stakeholders to help facilitate understanding and improve communication.
- Attend the Columbia River Policy Advisory Group meetings. Attend the Small Community Initiatives (SCI) steering committee meetings and seek guidance and feedback from this group.
- Create and compile fact sheets, trainings and/or other resources to help communities understand the extent of the problem.
- Assist the impacted communities as necessary to find community-based opportunities and solutions.
- Establish questions for the questionnaire and send to the 116 DOH identified water systems. Set up meetings for 1-on-1 interviews with water systems.
- Create questions for the interviews.
- Conduct the interviews.
- Prepare a summary report for each water system to include findings and recommendations based on questionnaire and interviews.
- Hold at least one community meeting/training in each of the four counties (Franklin, Grant, Lincoln and Adams) per year. Create an easy to use template/spreadsheet for recording water level data and provide to the impacted water systems.

Budget Information: See separate attachment document, Mid-Columbia Resiliency Scope and Budget Overview

DOH Contract Manager: Arlene Hvatt **Department of Health** PO Box 47822 Olympia, WA 98504-7822 Email: Arlene.Hyatt@doh.wa.gov Phone: (360) 236-3131

DOH Contract GVS23068

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Mid-Columbia Resiliency Scope and Budget Overview

			SF18			Γ			SF	61			
	Ben Serr GMS	New Staff	SCI	SUB-TOTAL	Research Services	Totals	Beń Serr GMS	New Staff	SCI	SUB-TOTAL	Research	Totals	Totals
FIE	0.20		- 0.0	0.25	C.43	0.68	0.30	0.50	0.05	0.85	0.15	1.00	1.68
Budget	\$26,282	. \$0	\$7,607	\$33,889	\$51,841	\$85,730	\$39,270	\$64,694	\$7,783	\$111,747	\$19,523	\$131,270	\$217,000
Collect Data/ Fact Finding / Reporting													
Review reports and complie relevant data/infortration													
Identify gaps				1									
 Prepare fact sheets and presentations 									N. 1972				
Quarterly/progress reports		12											
Final report				T									
				1									
Outreach to Smail Water Systems													
Survey small water systems			_										
1-on-1 interviews with water systems													
 County/regional meetings/trainings (1 per county per year) 													
 Summary report for each water system 													
Coordination with Stakeholders													
Policy Advisory Group members (OCR/Countles/In/gation Districts)													
 SCI points of contact/ liaison (DOH ERD/HQ: ECY WQ/WR; COM Growth Mangement) 													
 Facilitate regional coordination/partnerhsips (where possible/ opportunities arise) 													
State legislators/federal representatives			4 4 4	1									
•				1									
	BIOS anny-2102 Aint	July 2018-June 201	9										
Mid-Columbia	Year 1	. Year 2											
TOTAL	SFY.1B 0.68	SFY 19 1.(17-19										
A-5AL	45,982	70,8:	87 116,819	100200									
B-BEN C-PSC	16,896	. 25,9	10. 42,805								•		
E-GOODS	5,064	6,1	45 11,209	2004010									
G-I KAVEL	- 2005'E	Ϋ́,	00 10,000										23
N-GRANTS	•												
IA-INURAECI TC-INTRA	14,235	9,12	78 35,165										
TOTAL	85,730	131,21	20 217,000	1000									
SIAG	(85,730)	12,161)	70) (217,000										
TOTAL			,										



CONTRACT AMENDMENT

NAME OF CONTRACTOR	2. CONTRACT NUMBER
Department of Commerce	GVS23068
a ADDRESS OF CONTRACTOR (STREET)	2a. AMENDMENT NUMBER
P.O. Box 42525	
b. CITY, STATE, ZIP CODE	1
Olympia, WA 98504-2525	,
 THIS ITEM APPLIES ONLY TO BILATERAL AMENDMENT The Contract identified herein, including any previous amendments there below by mutual consent of all parties hereto. THIS ITEM APPLIES ONLY TO UNILATERAL AMENDMENT 	S. eto, is hereby amended as set forth in Item 5
The Contract identified herein, including any previous amendments there Item 5 below pursuant to that changes and modifications clause as conta	eto, is hereby unilaterally amended as set forth in ined therein.
. DESCRIPTION OF AMENDMENT: The purpose of this amendment year 21 funding in the amount of \$40,951.63 to year 22. All other terms ar original contract. This will allow for the continued education and outreach in the Mid-Columbia Basin.	it to extend the period of performance and change ad conditions remain in full force and effect of the h to impacted Group A Water System Customers
 5a. <u>Statement of Work:</u> Exhibit A is revised in accordance with Exhibit 5b. <u>Consideration:</u> This amendment will neither increase nor decrease to consideration of this contract and all amendments shall not exceed \$2. 	t A-1, attached hereto and incorporated herein. he Contract Consideration; therefore, maximur 17,000.00.
5c. <u>Period of Performance:</u> is extended through August 31, 2019.	
5d. The Effective Date of this Amendment: is the Date of Execution.	
 All other terms and conditions of the original contract and any subseque effect. This is a unilateral amendment. Signature of contractor is not require 	nt amendments thereto remain in full force and d below.
Contractor hereby acknowledges and accepts the terms and condition	ns of this amendment. Signature is required below
CONTRACTOR SIGNATURE (also, please print/type your name) Mortia Mc Morry Assistant Director	6/18/19
DOH CONTRACTING OFFICER SIGNATURE	DATE
Frank Webley	6/21/19
Chief & With the Contract Specialist	

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DOH Contracts Office

DOH Amendment GVS23068-1 Revision 04/19 Page 1 of 4

EXHIBIT A-1 STATEMENT OF WORK DOH CONTRACT #23068-1 WASHINGTON STATE DEPARTMENT OF COMMERCE DATE OF EXECUTION THROUGH AUGUST 31, 2019

DOI	L Contract # 23068-1	Mid-Columbia Resiliency Coordination	Budget for this Task: \$217,000		
		Description and Objectives		Staff Allocations	
Declin An Oct study, Resilie help th	ing aquifers threate tober 2012 study ic at least half of thos ncy Coordination j e systems organize	en the reliability of at least 116 Group A - Community water lentified current and future water supply conditions for 25 of se systems will be unable to meet future water needs, eight of project will provide education and outreach to the potentially and communicate their current efforts and future plans.	systems serving the Mid-Columbia Basin. those water systems. According to that them by 2030. The Mid-Columbia impacted systems and their customers, and		
Object	tives of this projec	et:		The program tasks will be	
1.	 Provide a constructive and coordinated voice for the water utilities in communicating the issue facing the region and the impact it has on these communities with stakeholders such as the Office of the Columbia River, the Groundwater Management Area, Departments of Agriculture and Ecology, the agricultural community, and the region's consumers. 				
2.	Communicate iss	ues specific to the water utilities to the stakeholder groups.		Services (GMS) with	
3.	Promote regional	partnership building.		to accomplish program	
4.	Collaborate with	impacted communities to identify the pros/cons of using diff	erent water sources.	objectives and outcomes.	
5.	Identify gaps and	needs in current data gathering efforts.			
6.	Encourage region	al solutions and suggest possible partnerships to improve co	ordination and success.		
7.	7. Provide a facilitator for community meetings and workgroups.				
This et water.	fort is consistent w	with the Capacity Development Strategy to ensure a safe and a	reliable supply of high quality drinking	2	
		Specific Outputs an	d Outcomes		
	Strengthened, mo	re effective partnerships between utilities, decision-makers,	regulators, stakeholders, and technical assista	nce providers.	

Improved participation of the small communities in the larger conversation and improved understanding of the extent of the issues by all stakeholders.

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MID-COLUMBIA RESILIENCY COORDINATION: FINAL REPORT 2019

EXHIBIT A-1 STATEMENT OF WORK DOH CONTRACT #23068-1 WASHINGTON STATE DEPARTMENT OF COMMERCE DATE OF EXECUTION THROUGH AUGUST 31, 2019

Improved managerial and technical capacity of impacted utilities.

Small systems that are better prepared to scope the extent of the issue, develop water shortage response plans, collaborate with other stakeholders to develop regional water supply strategies for economic development and comprehensive planning, and collaborate with other stakeholders to develop a regional plan to address groundwater preservation.

Deliverables	Deliverable Due Dates
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EXHIBIT A-1 STATEMENT OF WORK DOH CONTRACT #23068-1 WASHINGTON STATE DEPARTMENT OF COMMERCE DATE OF EXECUTION THROUGH AUGUST 31, 2019

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