



Greater Harney Valley – Groundwater Study Advisory Committee Meeting  
Tuesday, October 17, 2017  
10:00am – 4:00pm  
Harney County Community Center – 484 Broadway St., Burns, OR



## October 17, 2017 - Meeting Summary

### Participants

#### Advisory Committee Members

Allison Aldous, The Nature Conservancy  
Angie Ketscher, Citizen/Landowner  
Brandon Haslick, Burns Paiute Tribe  
Brenda Smith, High Desert Partnership  
Erin Maupin, Citizen/Landowner  
Fred Otley, Citizen/Landowner  
~~Herb Vloedman, Citizen/Landowner (not present)~~  
Gary Ball, US Fish and Wildlife Services  
JR Johnson, OWRD  
Karen Moon, Harney County Watershed Council  
Mark Owens, County Commission and Landowner  
Steve Rickman, Landowner/Business Owner  
~~Tony Hackett, Downright Drilling (not present)~~  
Wayne Evans, Citizen/Landowner

#### Groundwater Study Team

Darrick Boschmann, OWRD  
Jerry Grondin, OWRD  
Justin Iverson, OWRD  
Halley Barnett, OWRD  
Steve Gingerich, USGS  
Hank Johnson, USGS  
~~Esther Pischel, USGS (not present)~~  
~~Amanda Garcia, USGS (not present)~~  
~~Nick Dosch, USGS (not present)~~

#### Others

Harmony Burrigh, OWRD (Facilitator)  
Jonathan LaMarche, OWRD  
Bob Houston, DOGAMI  
Jason Spriet, OWRD

### Meeting Overview, Action Items, Recommendations, and Updates

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The purpose of this meeting was to learn about key components of the groundwater study, provide updates on activities since the last Advisory Committee meeting, and brief the Committee on upcoming activities. OWRD delivered a presentation on how larger climate cycles affect local water cycles and patterns of water availability. During the work session, OWRD and USGS updated the Committee on activities since July as well as upcoming activities. The Oregon Department of Geology and Mineral Industries (DOGAMI) delivered a presentation on the geologic mapping work they have been doing in the Harney Basin and how that information will be used in the groundwater study. The presentation was followed by a trip to an outcropping to look at the different geologic units and discuss their location, thickness, orientation, water bearing properties (their ability to hold water), and other characteristics.



Figure 1 and 2. Looking at rock outcroppings with Bob Houston and Carlie Duda from the Oregon Department of Geology and Mineral Industries (DOGAMI)

**Action Items**

<b>Who</b>	<b>What</b>	<b>When</b>
OWRD and USGS	Work on a briefing handout describing methods to estimate evapotranspiration	February 20
Harmony B, Karen M, Angie K, and Halley Barnett	Work on a brief handout describing the groundwater study.	September 30 <b>Outstanding</b>
Harmony B and Karen M	Update the Harney County Watershed Council website with Groundwater Study information.	September 30 <b>Outstanding</b>
Harmony B, Karen M and Angie K	Develop a draft outreach strategy for the Advisory Committee to consider at the next meeting.	September 30 <b>Outstanding</b>
Mark O	Convene additional meetings of the sub-committee to continue working on local monitoring efforts.	October 17

**Decisions/Recommendations**

- None

**Proposed Future Discussions**

- OWRD’s geologic compilation map and initial thoughts on hydrostratigraphic units
- Groundwater concepts:
  - Groundwater contours
  - Hydraulic connectivity
  - Hydraulic head
  - Hydraulic gradients
- Steps and methods to develop a water budget
- Regular check-ins on other monitoring/data collection efforts.

**Updates**

The next meeting is scheduled for Thursday, January 18 from 10am - 4pm at the Harney County Community Center. The chair (Mark Owens) and facilitator (Harmony Burrigh) will develop and distribute an agenda for review prior to the next meeting. If you would like to propose discussion topics, email them to: [harmony.s.burright@wrd.state.or.us](mailto:harmony.s.burright@wrd.state.or.us).

## Detailed Meeting Notes

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### PRESENTATION

The meeting began with a 1 hour community presentation, followed by an opportunity for members of the public to make comments for the Advisory Committee to consider during their meeting.

Hank Johnson, a groundwater scientist, with the US Geological Survey delivered an abridged version of a presentation he gave at a previous meeting on closed basin hydrology, including an overview of the major drainages. He provided a high level summary of how water generally moves through a closed basin and how it can exit a closed basin.

Jonathan LaMarche, a surface water scientist with the Oregon Water Resources Department delivered a presentation on large-scale climate cycles, how those climate cycles affect local water cycles, and how these cycles can be observed in surface water and groundwater hydrographs. According to Jonathan, climate and geology are important “bookends” that determine water availability. He showed an example of a hydrograph that followed patterns in the climate (rising and falling in response to wet years or dry years). He discussed how you could look for these patterns in data to differentiate when water levels are responding to climate and when they are responding to human influences (e.g., groundwater pumping). The presentations can be accessed online at: <http://bit.ly/malheurlakebasin>.

### Key Discussion Topics/Questions:

- There was general interest among the group to understand how climate data factors into the groundwater study. The Groundwater Study Team indicated that it will be important to generally understand how changes in groundwater levels/groundwater storage respond to changes in climate over time (inter-annual variability). It can help us understand how long it takes the system to respond to different climate conditions (lag time). It is also important to be able to understand and differentiate between climate influences on groundwater levels and human influences on groundwater levels. If you look at patterns in the larger climate cycles you can see similar patterns at the local level – though it is different for each place depending on the hydrogeologic system. The current focus is to characterize the system. Climate data will be an input to the model and can help the group look at how the system responds under different climate scenarios and different management scenarios.
- Fred noted that there are many factors that can influence recharge from one area to the next and from one year to the next, including the following:
  - How the precipitation falls (whether it falls as snow or rain) and how it freezes and thaws can influence how and when the water enters the system and whether it is able to effectively recharge the groundwater system or whether it will runoff as surface water.
  - Vegetation management and the relative evapotranspiration of vegetation in different drainage areas can affect how much water is available to recharge the system.

- During the presentation Jonathan indicated that the Donner Und Blitzen watershed isn't as responsive as the other drainage areas to precipitation in the preceding years, which may suggest that there is a greater groundwater component to that system whereas the Silver Creek and Silvies River drainages are more surface water dominated. Fred wondered if this information would suggest the presence of distinct groundwater systems. Jonathan indicated that the hydrologic setting can vary from place to place – the hydrologic setting is primarily influenced by geology and climate. Climate and hydrology are the “book ends” for the system, with lots of other variables that influence how water moves through the system (topography, vegetation, soils). Jonathan indicated that information about geology and groundwater levels will help to identify whether aquifers are connected or distinct.

**Decisions Points/Recommendations:** None

**Action Items:** None

**Proposed Future Discussion Topics:** None

## PROJECT MANAGEMENT UPDATES

OWRD provided updates on policy and budget outcomes from the 2017 session, as well as overall project management updates.

- Funding for the Harney Groundwater Study remains unchanged and the study will continue as planned. The study is on schedule and there are no modifications to the work plan.
- OWRD did not receive any additional funds for another basin study team that we would have deployed elsewhere in the state.
- OWRD's budget for drilling new observation wells was cut by \$100k, which will limit the number of new wells that can be drilled in the next biennium. Some of the drilling budget will be used to drill wells in the Walla Walla basin where there are observed groundwater declines. Some funding will also likely be used to drill a few more dedicated observation wells in Harney County.
- OWRD's cost-share measurement program will be extended to groundwater (it was previously only available to surface water users). This will allow OWRD to share the costs of installing measurement devices for groundwater users. This goes into effect on January 1. OWRD is modifying their internal program for accessing these funds and will likely bring this to the SAC at the January quarterly meeting. OWRD encourages every groundwater user in the community to install meters and report use since this will support the study and will also be useful for future management in the basin.

**Decisions Points/Recommendations:** None

**Action Items:**

- Justin I. will bring information about the water measurement cost-share opportunity to the January GWSAC meeting.

**Proposed Future Discussion Topics: None**

**OWRD TECHNICAL UPDATES**

Jerry Grondin with OWRD updated the Committee on activities they have accomplished since July as well as upcoming activities, including:

- **Geology** - OWRD has compiled geologic maps, drilled 9 dedicated observation wells, coordinated with the Department of Oregon Geology and Mineral Industries (DOGAMI) on geologic mapping activities, identified preliminary hydrostratigraphic units, and lithcoded 2,364 wells. The next steps are to tie lithcodes at wells to the hydrostratigraphic units, finish a draft of the geologic compilation map that can be shared with the Advisory Committee, and refine the hydrostratigraphic units. OWRD is also working to drill more observation wells in the basin.
  - **Question** – What is a lithcode? A lithcode is contained in a driller’s well log – it describes what type of rock they found at different depths. This information is entered into a database and can be used as a tool to understand the subsurface.
  - **Question** – Where are the priority areas for the remaining observation wells? The site west of Chickahominy reservoir and the OSU Agricultural Research Center are the priority areas.
- **Groundwater Hydrology** – 118 wells were included in the August quarterly measurement, and 225+ wells were included in the Fall synoptic measurement. There are also 21 continuous recorder wells collecting data year round. OWRD is entering current and historic groundwater data into the database. The groundwater database is migrating to a more user friendly format. OWRD is also beginning to look at groundwater trends and flow directions, though no official analysis has been conducted yet.
- **Aquifer Properties** – OWRD has taken the specific capacity data of 1,592 wells and needs to tie it to hydrostratigraphic units. OWRD anticipates conducting aquifer tests between January-February. This information will be used to conduct an analysis of aquifer properties.
- **Groundwater Budget** – There are now two evapotranspiration stations set up in the basin to measure evapotranspiration of native vegetation and crops. Spring discharge was measured at sites in the Warm Springs Valley. Surface water seepage runs are planned for the Silvies River, Silver Creek, and Donner Und Blitzen tributaries – these seepage runs help to understand areas of recharge to and discharge from groundwater to surface water features.
- OWRD shared the following general observations, but were careful to note that focused analyses had not yet been conducted:
  - Groundwater Flow in the Silvies River, Silver Creek, and Donner und Blitzen watersheds in general flows toward Malheur-Harney Lakes with some local variances. Possible outflow to the Virginia Valley has not been confirmed or ruled out – additional data is needed to make this determination better define groundwater flow.
  - Precipitation from Winter 2017 did have some influence on groundwater at some wells – it varied from area to area and well to well.

- Ongoing groundwater level declines continue in the Weaver Springs and Crane-Buchanan areas. The rate of groundwater decline adjacent to Weaver Springs area appears to be less than within the Weaver Springs area.
- The 4,100 foot groundwater level contour appears to have migrated from the vicinity of Wrights Point to North of Highway 20.

**Decisions Points/Recommendations:** None

**Action Items:**

- A member of the public would like to see the Hines Public Wells measured as a part of the groundwater study and volunteered to connect OWRD to the City of Hines.

**Proposed Future Discussion Topics:**

- OWRD's geologic compilation map and initial thoughts on hydrostratigraphic units
- Some concepts that the group would like to revisit at a future meeting are:
  - Groundwater contours
  - Hydraulic connectivity
  - Hydraulic head
  - Hydraulic gradient

## USGS TECHNICAL UPDATES

USGS updated the Committee on activities they have accomplished since July as well as upcoming activities, including:

- **Water Budget** – USGS is working on different elements of the water budget, including estimates of evapotranspiration. They are working to map vegetation across the basin and are working with other agencies that have already compiled vegetation maps (NRCS, USFWS, etc).
  - **Request** – There was a request from an Advisory Committee member to have more information about how evapotranspiration is estimated. There are questions circulating in the community, and it would be good to have some resources available. USGS will provide a road map at the next meeting for how a water budget is developed, including ET estimates.
- **Isotopic Analyses** – Hank Johnson with the USGS provided an update on the work they have been doing to analyze isotopes in water samples from wells and springs in the basing. Isotope analysis is the identification of isotopic signature, which can be used to understand where the water originally came from. This can shed light on how water travels in the basin. Hank provided a preliminary analysis based on recent lab results. He will share a more in depth analysis at a future meeting.
  - **Observations** – The Advisory Committee was very interested in the isotopic analyses and would like to receive updates in the future.

- **Groundwater Level Map** – USGS is still working on the interactive groundwater level map (online tool to view groundwater level data). They anticipate this will be ready to share by the next meeting.

**Decisions Points/Recommendations:** None

**Action Items:**

- OWRD and USGS will work to pull together materials that communicate how evapotranspiration is estimated.

**Proposed Future Discussion Topics:**

- Steps and methods to develop a water budget

### OTHER MONITORING/DATA COLLECTION EFFORTS

- **Harney County Watershed Council (HCWC)** – Angie with HCWC has completed three rounds of monitoring (79 wells). Darrick will be going out with Angie in January.
- **The Nature Conservancy (TNC)** – Allison informed the group that The Nature Conservancy is pursuing funding to study ecosystems that are dependent on groundwater and how these ecosystems may be impacted by groundwater development. They would like to give a presentation at a future meeting about how groundwater levels affect ecosystems that rely on groundwater inputs.
- **US Fish and Wildlife Service (USFWS)** – Gary informed the group that the USFWS still plans to install a gage at the lake. He will keep the group updated.
- **Department of Environmental Quality (DEQ)** – DEQ has proposed to collect groundwater quality samples in 2018 to establish a baseline understanding of groundwater quality in the basin. This is a voluntary process that equips well owners with information about their water. DEQ is presenting to the Harney County Court on the 18<sup>th</sup>. If DEQ moves forward they will be looking for volunteers throughout the County.
- **Other efforts** – LiDar is being flown in the Silver Creek Basin to support the Harney Basin Wetlands Initiative. LiDar has already been flown on the refuge. There is an opportunity to gather additional LiDar data when the Silver Creek Basin is being flown if there is interest and funding available from local partners.

**Decisions Points/Recommendations:** None

**Action Items:** None

**Proposed Future Discussion Topics:**

- Regular check-ins on other monitoring/data collection efforts.



## **GEOLOGIC MAPPING - DOGAMI**

Bob Houston with DOGAMI delivered a presentation on their geologic mapping activities in the Harney Quadrangle and their plans to map other quadrangles. He talked about the importance of these mapping efforts since it can be an input to emergency preparedness, economic development, and scientific investigations. He gave an example of how information collected by DOGAMI has been used to support local decision-making. Following the presentation Bob and his colleague accompanied the group to two outcroppings in Highway 395 that show a good cross-section of the geology in the basin.

**Decisions Points/Recommendations:** None

**Action Items:** None

**Proposed Future Discussion Topics:** None