

# Henry's Fork Watershed Council Annual Watershed Conference

Tuesday, December 4, 2018

Participants began registering at 8 a.m. at the SpringHill Suites in Rexburg.

Brandon Hoffner, of the Henry's Fork Foundation (HFF), called the meeting to order. Participants introduced themselves. Brandon called for two minutes of silence so that participants could prepare themselves for a respectful and objective meeting, noting that it has been a tradition of the council since its inception. Brandon explained that the intent of Watershed Council meetings and conferences are to work together and better our communities. Brandon then opened up the meeting to any announcements or comments.

## Community Building

Darrin Miller, USGS, shared that he is relatively new to his position and looks forward to getting to know the Watershed Council participants better.

Jeff Raybould, Idaho Water Resource Board, shared that he was here 25 years ago when the Watershed Council had a bit of a rocky start. Things began during a disagreement about the Henry's Fork Basin Plan, but folks wanted a better way to solve problems. Over time the Watershed Council has thrived because of everyone's willingness to cooperate. This year is the 25<sup>th</sup> anniversary of the Henry's Fork Watershed Council.

Jerry Rigby, Rigby, Andrus & Rigby Law, agreed saying that the group began with the basin plan for the water board and some were fearful that the plan would change the rules, which added to the initial agitation within the Watershed Council.

Brandon Hoffner, HFF, added that when it comes to water issues, the Watershed Council is certainly not perfect, but we are able to work through issues pretty well thanks to the trust this group worked so hard to develop over the years.

## Keynote Speaker

Gary Spackman, Idaho Dept. of Water Resources

Often folks run into the issue of believing they already know the answer to a question and go out to gather facts that support their position. However, if we're willing to say that we don't know everything about a subject, and are willing to engage and talk about it, we are much better set up for success.

The Idaho Department of Water Resources (IDWR) is kind of like the "water police", responsible for enforcement. Following the settlement agreement, an issue was ordered requiring measurement and reporting of diversions by installing measuring devices. This affected 5,000 wells and 3,000 users, and not all completed installation in the required time. Throughout the summer of 2018, IDWR committed man power in the field to check and verify installation at

those sites. They ended up with a small list of non-compliant wells and worked with those users to see what was needed.

Now, for the most part, all devices are in place allowing for greater transparency in water use. It is much more clear how much water is being diverted and this transparency has decreased the instances of folks being suspicious of one another. With measuring devices, users can log on and see what everyone is diverting any given day and see that everyone is doing what they are supposed to be doing.

After the settlement agreement, 19 wells were chosen to help track aquifer recharge progress. As we know, the annual ground water index has been decreasing since the 1980s. Since 2016, the aquifer has been recovering, but significant flooding in 2017 may have helped that. So, the increase is great, but some can be attributed to IDWR's intentional recharge efforts and some may just be due to flooding. In general, we are not on a long-term track to meet the benchmarks set, even though 2017 was a good year. There is a lot to be proud of, but we can't rest on our laurels. We must keep working hard to replenish the aquifer.

## **Development of a Sustainable Water Supply for the Mountain Home Air Force Base & The Boise Feasibility Study**

Randy Broesch, Idaho Dept. of Water Resources

In 1982, Idaho Dept. of Water Resources (IDWR) designated a portion of Elmore County as a groundwater management area and recognized that ground water levels were decreasing on the Mountain Home Plateau. The Mountain Home Air Force Base (AFB) saw a need for a more reliable water supply as a 2010 study found that the groundwater supply would be depleted in 30-36 years.

The Water Board looked into becoming a municipal water provider and the AFB looked into military funding, which is very difficult to get for an AFB. In 2016, the Water Board started negotiating a partnership with the AFB to be a long-term municipal provider. Final stages of negotiations are on hold due to the AFB's contract limitations. Discussions are ongoing on how to split the responsibilities of the project – perhaps the Water Board will handle the infrastructure to get water to the base and the AFB will provide a water treatment plant.

Regarding the Boise River Feasibility Study, IDWR is looking into the feasibility of a raise of Arrowrock Dam on the Boise River for additional surface water. However, it was found to not be in the best interest of all involved. IDWR then worked with the Bureau of Reclamation for ideas for additional water supply on a smaller scale and came up with potential minor raises at Lucky Peak, Arrowrock, and Anderson. The original Arrowrock project would rebuild the entire dam, making it a very big project.

The WIIN Act is helping to streamline the process by helping projects like these move forward. IDWR is focused on Anderson Ranch with a goal of 2021.

## **Status of Waters of the United States and the Columbia River Treaty**

Jerry Rigby, Rigby, Andrus & Rigby Law, PLLC

### Columbia River Treaty

The 1964 Columbia River Treaty (CRT) governs Columbia River flows for flood control and power generation. This treaty guaranteed flood control space in Canadian reservoirs, largely to prevent flooding in Washington and Oregon. In 2024, flood control would change from “guaranteed” to “called upon” and require Canada to mitigate floods that “could not be adequately controlled by all the related [U.S.] storage facilities” existing in 2024. This has implications for using Snake River reservoirs to capture spring water for flood control down in the lower Columbia River in lieu of Canadian Reservoirs. In some circumstances, this could require Snake River reservoirs to be emptied every year during the winter to make sure that there was enough storage to capture spring runoff. Additionally, it is argued that the Canadian Hydropower Entitlement payments included in the treaty are substantially higher than market price and should be rebalanced. Last, it is argued that US Entity should reconsider and eliminate Ecosystem Function as an additional purpose of the CRT because habitat and other ecosystem functions are already addressed under current US and State-specific laws and regulations.

### Waters of the United States (WOTUS) update

In the late 1980s, a court case with Rapanos as the defendant went to the supreme court to dispute the interpretation of “navigable waterways”. After the court case, the Corps of Engineers and EPA promulgated a new 75-page regulation attempting to clarify the scope of the WOTUS (The WOTUS Rule). Many folks saw the WOTUS Rule as an attempt to expand federal jurisdiction over water that had previously been under state jurisdiction. The WOTUS Rule did three things: 1) listed waters covered under the CWA, 2) listed specific exclusions, 3) defined terminology. There have been many jurisdictional issues from 2015-2018. The latest court actions happened in August 2018 when the South Carolina Court agreed with environmental groups that the Agencies failed to follow notice and comment requirements under the APA and the court granted a motion against the “Suspension Rule” and reinstated the WOTUS Rule. Parties are appealing.

## **IWRB – ESPA Managed Recharge Update & Other Recharge Projects**

Wesley Hipke, Idaho Dept. of Water Resources and Idaho Water Resource Board

As outlined in the Eastern Snake Plain Aquifer (ESPA) Comprehensive Aquifer Management Plan, the Idaho Water Resource Board (IWRB) set a goal of 250,000 ac-ft per year of managed aquifer recharge using the IWRB’s water rights. The program began full-scale operation in water year 2015 and since then has been able to use a much larger percentage of available water than in previous years. Essentially, water available for managed aquifer recharge is natural flow that would otherwise spill past Milner Dam. Such water is available every winter downstream of Minidoka Dam, but availability upstream of Minidoka and during irrigation season is

determined by water supply from year to year. High water supply in irrigation year 2018 allowed 536,001 ac-ft of recharge, well distributed across the entire upper Snake River basin. So far this fall, 65,061 ac-ft of water has been recharged, 57,165 ac-ft of which used storage water that had been purchased by the Idaho Groundwater Appropriators (IGWA) as mitigation under the settlement agreement between IGWA and the Surface Water Coalition (SWC). Since storage availability was good in 2018, this water was not needed for mitigation and so was donated to the recharge program. This water was recharged from August 16 to November 9, all upstream of Minidoka. The remaining recharge this fall took place downstream of Minidoka and in the Wood River basin. Canal maintenance and construction of new recharge infrastructure will limit recharge capacity this winter, so expected recharge in irrigation year 2019 will only be around 170,000 ac-ft. At full operation, current winter managed recharge capacity is 70 cfs in the Wood River basin, 920 cfs downstream of Minidoka, and 1,500 cfs upstream of Minidoka. This latter figure includes canal seepage, which counts for recharge only outside of irrigation season. During irrigation season, the capacity upstream of Minidoka is reduced to 190 cfs, which is what can be delivered off-canal to designated recharge sites.

Over 400 wells around the ESPA have been used to monitor the aquifer. In recent years, around 355 of these have been used. Monitoring indicates that the aquifer gained around 200,000 ac-ft in water year 2016, 640,000 ac-ft in 2017, and 1.7 million ac-ft in 2018. Most of the gain during 2017 and 2018 was the result of high water supply, including a large amount of direct precipitation on the ESPA during the winter and spring of 2017. Several new monitoring wells were drilled in 2018, particularly along the northern edge of the plain, where the current network is sparse. More wells will be drilled in 2019 and 2020 with funding from the Idaho National Laboratory, again filling gaps in the current network. More wells are planned beyond these. Locally, both water level and water quality is being monitored at recharge sites, including Milepost 31 on the Milner-Gooding Canal. Generally, water quality monitoring has failed to detect any of the constituents of concern. In particular, *E. coli* is always present in surface water used for recharge but is rarely detected in the monitoring wells. Results at the Egin Lakes (Henry's Fork) and Harold Jones (South Fork) sites are similar to those at Milepost 31.

Projects currently underway to expand managed recharge capacity on the ESPA include infrastructure at hydroelectric plants on Milner-Gooding, Big Wood, and Northside canals to allow more winter recharge. A new recharge site downstream of the hydroelectric plants on Northside is also being developed. Other expansion projects are underway at Egin Lakes, Harold Jones site, and the Great Feeder Canal. Outside of the ESPA, increasing water supply demands are creating needs for managed aquifer recharge in the Treasure Valley and in Elmore County. The IWRB is assessing potential for and feasibility of aquifer recharge in these locations.

## **An Update on Cloud Seeding in Southern Idaho**

Derek Blestrud, Idaho Power Company

Cloud seeding is either done "cold cloud" or "warm cloud". Cold cloud seeding depends on an abundance of super cooled liquid water. Warm cloud seeding depends on collision coalescence. Cloud seeding promotes growth of raindrops (warm) or snowflakes (cold).

There are a few types of cloud seeding, including fog suppression (at airports), hail suppression (to reduce crop and property damage), rainfall enhancement (water supply augmentation), and snowpack enhancement (what we do in Idaho). Super cooled liquid water (SLW) is water that is cold enough to freeze, but remains in a liquid state. Water in a liquid state can be present in clouds much colder than 32 degrees F. A snowflake is a microscope dust particle in a cloud. Cloud seeding introduces a dust particle into the natural cycle to encourage more snowflake formation. Idaho Power uses silver iodide. Winter orographic cloud seeding takes advantage of rising air cooling and forming clouds. The cloud seeding agent works sooner than natural dust particles because it is introduced at warmer temperatures giving the snowflake more time to grow to a size that would fall.

Mechanisms of cloud seeding include: ground based generator (in mountains, powered by solar panel, communicating through satellite modem, and injects acetone solution into a propane flume producing invisible smoke) and aircraft with flares. In the cold season states including Idaho, Wyoming, California, Nevada, Utah, and Colorado do cloud seeding. In the warm season, Kansas, North Dakota, Texas and Alberta, Canada conduct cloud seeding. High Country RC&D started cloud seeding projects in Idaho in the 1990s and Idaho Power began investigating cloud seeding in 1993 with literature reviews and a climatology study. Idaho Power's cloud seeding efforts were operational in 2003 in the Payette Basin as a test case. Over the next few years, Idaho Power began partnering and monitoring sites. In water year 2015, they had 44 generators and 2 aircraft. In their current program, they have 57 generators and 3 aircraft.

Idaho Power estimates their efforts have provided an additional 270K acre-feet of water per year in the Payette. In the Upper Snake that value is 475 K acre-feet per year. Idaho Power is contributing to a series of papers on the effectiveness of cloud seeding. They believe well-run programs can be neutral or positive to the overall water supply. Silver iodide, which is used in the cloud seeding, is inert and cannot be ingested by aquatic organisms.

## **Modern Technology for an Ancient Practice: Automation and Hydraulic Modeling at Aberdeen-Springfield Canal Company**

Steve Howser, Aberdeen-Springfield Canal Company

Archaeological evidence indicates that irrigated agriculture was being practiced as early as 6,000 BCE and spread rapidly between 3,000 BCE and 2,000 BCE. In North America, the Hohokam in what is now central Arizona built at least 700 miles of irrigation canal in the 14<sup>th</sup> century. Irrigated agriculture was first developed in the upper Snake River basin with Euro-American settlement here in the late 19<sup>th</sup> century. Federal programs under the Desert Lands Act and Carey Act helped facilitate settlement of the Snake River basin and construction of irrigation infrastructure. Prior to the turn of the 20<sup>th</sup> century, irrigation was solely reliant on natural flow, but it became evident by 1900 that natural flow was not sufficient to provide reliable water supply for irrigation basin-wide. Irrigators in the Magic Valley were the first to create large-scale storage, by building a dam on Jackson Lake in 1906 to expand the natural

lake's capacity. Similarly, irrigators in the St. Anthony area built a dam on Henry's Lake in 1923 to expand its capacity. Following passage of the Reclamation Act in 1902, the U.S. Bureau of Reclamation took over construction of storage reservoirs in the upper Snake River basin, including Minidoka, American Falls, Island Park, Grassy and a rebuild of Jackson. After World War II, Palisades and Ririe were added to the storage system.

The Aberdeen-Springfield Canal was built in 1895, and the then-named American Falls Canal and Power Plant Project was the first Carey Act project, purchasing 80,000 acres of desert for \$0.50 per acre in 1896. The Aberdeen-Springfield Canal Company (ASCC) currently manages around 170 miles of canal and delivers water to 480 shareholders on 62,000 acres of irrigated land. Management of the canal strives for reliable and equitable distribution of available water in proportion to acreage. This requires accurate measurement and precise adjustments at headgates and check dams. Traditionally, users ordered water 48 hours in advance, and changes were made twice each day. However, in a large system such as ASCC, "bad things happen in the middle of the night" such as blocked headgates and overflows. This created a need for automation of canal operations. ASCC started automating check dams in the 1950s and eventually installed a Supervisory Control and Data Acquisition (SCADA) system, which allows operation of the canal system remotely in real time. The SCADA system currently consists of 45 dataloggers, 17 control stations, 28 monitoring stations, and 60 sensors—30 measuring water level and 30 measuring gate positions. Other sensors measure discharge in four wells. The system includes three computer servers and video monitoring. The SCADA system minimizes person-hours devoted to canal operation, increases reliability of water delivery, and maximizes safety.

The 2015 settlement agreement between the Surface Water Coalition (SWC) and Idaho Groundwater Appropriators (IGWA) has generated new challenges for management of the canal system. Canal capacity during the months of peak demand—June through August—first limited water delivery as early as the 1920s. At the time, all irrigation was applied directly to fields from ditches via flood and furrow delivery. This type of irrigation was amenable to temporary decreases in delivery due to capacity limits, because the system had no minimum requirements for operation. As sprinklers began to replace flood irrigation during the 1950s, canal capacity became limiting, because sprinklers require full supply at each sprinkler line or pivot to operate. To ensure full water supply, users began drilling supplemental groundwater wells to maintain supplies when the canal system was unable to deliver full supply to all users. Because of the convenience and reliability of sprinklers, many users abandoned use of canal water altogether, and capacity issues were alleviated by the 1970s. However, cuts in groundwater use required by the SWC-IGWA settlement have forced these users to use canal water again, and canal capacity has once again become an issue for ASCC.

Canal seepage and managed aquifer recharge compound the problems with canal capacity. Aberdeen-Springfield canal loses about 200,000 acre-feet of water (over 50% of total diversion) each year to canal seepage. Lining the canal to reduce seepage loss increases the amount of diverted water that must be delivered through the canal. While this provides more water to offset reductions in groundwater use, the canal has insufficient capacity to deliver the additional

water. Reducing canal seepage also reduces the amount of water recharged to the aquifer, which lowers groundwater levels and reduces return flows to the river and American Falls Reservoir. Replacement of traditional incidental recharge with intentional managed aquifer recharge is a partial solution to the recharge issue but still does not address the capacity issue. So, in 2016, ASCC began a detailed investigation of canal capacity, seepage, and groundwater levels in order to produce a model of surface and groundwater flow throughout the canal system and adjacent portions of the aquifer. The first step in this project was high-resolution mapping of the canal system using Light Detection and Ranging (LiDAR) technology. Using equipment purchased by ASCC and in-house personnel, the cost was around \$175,000, roughly what it would have cost to use external consultants, with the benefit that ASCC now has the equipment and can provide fee services to smaller canal companies to conduct similar surveys. The second step in this project was measurement of seepage rates and water table levels, which constituted the master's thesis of Heather Rice, ASCC's hydrologist. The next phase of the project will be development of the flow model itself.

### **Private Managed Aquifer Recharge on the Eastern Snake River Plain**

Keith Esplin, Recharge Development Corporation

Eastern Snake Plain Aquifer Recharge (ESPAR) is a successor organization to Recharge Development Corporation. ESPAR is a non-profit corporation owned by investors including farmers, cities, and groundwater districts. It is argued that private managed aquifer recharge is necessary to accommodate Idaho's growing population and limited water surface supply capacity. Idaho is the fastest growing state in the country.

RDC developed patent pending system for tracking managed aquifer recharge based on Aquifer Recharge Units (ARU), which is the space for one acre-foot of water. ESPAR is the first "canal" company created to deliver water to and from sources using ARUs. ESPAR was created under the state statutory provisions as surface canal companies. They have a goal of recharging 40,000 acre-feet per year.

### **Henry's Fork Groundwater District**

Aaron Dalling, Fremont-Madison Irrigation District

The Henry's Fork Ground Water District (GWD) is the second smallest groundwater district in the state and was founded in 2017. Henry's Fork GWD is located between Jefferson-Clark and Madison GWD's. In 2016 farmers from Southern Idaho came together and agreed upon a settlement that focuses on restoring the Eastern Snake Plain Aquifer. Parts of the settlement include a consumptive use volume reduction, annual storage water delivery, irrigation season reduction, mandatory measurement requirements and an emphasis on managed recharge. Madison and FMID are required to directly deliver 1,500 AF of Storage to IGWA, and 3,000 AF of annual recharge minimum. Total Cost of the Madison and Henry's Fork GWDs Mitigation is \$105,000 Annually. Henry's Fork GWD continues to monitor ground water levels at Sentinel

Well locations. From 2016 to 2018 the Henry's Fork GWD saw an upward trend in Sentinel Well water level and this trend is projected to continue through 2026.

## **Community Building and Wrap-Up**

Aaron Dalling, FMID, asked for another moment of silence to reflect on the day and prepare any final announcements or reflections to share.

Bryce Contor, HFF/FTR, shared that if there were a theme from today, it might be that everything seems to be cautiously optimistic.

Keith Esplin, RDC, shared the importance of letting legislators know how important recharge is in the long run. Legislators say that changes in tax laws at the federal level have decreased receipts by \$40 million and income receipts by \$90 million, which will make budgeting difficult.

Wesley Hipke, IDWR, wanted to compliment the Watershed Council and Idaho for the work done here. Coming from outside the state, it is amazing the amount of work accomplished. It takes everyone and looking at the whole system to manage water as effectively as possible. He says that can't always be found across the West.

Rob Van Kirk, HFF, is also cautiously optimistic. It can be difficult to detect if what you've done has had an effect, it takes decades. When looking at the graph of the aquifer level, you can't say one irrigator's switch to sprinklers made it happen, but when you look over 50 years, you can tell something has happened. Hopefully, we keep these programs going and in 20 years we can say the collective effort made a difference.

Randy Johnson, Forsgren Associates, pointed out that we have some powerful tools to understand our water situation and instead of being afraid of measurement, it makes all the difference to help shorten up those decades because we will really know what is going on with water. Randy also shared that there will be a public meeting about the Fun Farm Bridge at the Fremont County Annex this Thursday at 7 pm.

Brandon Hoffner, HFF, shared that the success HFF has had in the Henry's Fork would not have been possible without partners and everyone in this room making our success possible.

Rob Van Kirk, HFF, shared that the 2003 Conveyance Act requires that the Drought Management Plan be revised every 5 years. It has finally been revised and signed today. If anyone would like a copy, please email [rob@henrysfork.org](mailto:rob@henrysfork.org).

Sheryl Hill, citizen, announced that Dan Garren has been promoted to Regional Supervisor of the SE Region (IDFG). Dan participated in the Watershed Council for 20 years or so and he will be missed.