

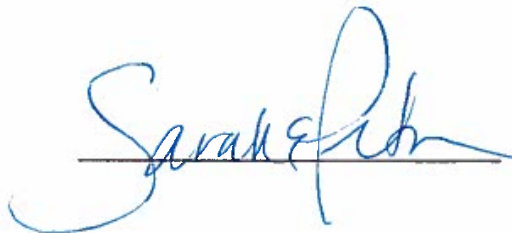
BLM-031

**Report Supporting
Bureau of Land Management Claimed Public Water Reserve 107s
in Diamond Valley, Nevada**

February 21, 2019

Prepared by:

Sarah Peterson
State Lead for Soil, Water, Air and Riparian Programs
Bureau of Land Management
1340 Financial Blvd
Reno, NV 89502
775-861-6516
sarahpeterson@blm.gov

A handwritten signature in blue ink, appearing to read "Sarah Peterson", is written over a horizontal line.

Introduction

My name is Sarah Peterson. I am the State Program Lead for Soil, Water, Air and Riparian for the Bureau of Land Management (BLM) Nevada State Office. I hold a Bachelor's Degree in Water Science from Northern Michigan University and a Master's Degree in Hydrology from the University of Nevada – Reno. My professional experience is focused on 16 years with the Federal government as a hydrologist and specializing in water resources management on public lands. I have participated in two major court cases related to water rights with the Federal government, the US v Hage Case in 2012 and the Delong RS2339 Settlement in 2014. I have also conducted field work related to various other water rights adjudications in Nevada, such as the Smoke Creek and Owyhee adjudications. I conducted hydrologic field investigations related to Public Water Reserve 107 (PWR) and vested water rights in preparing and filing claims on behalf of BLM. I have extensive experience with topographic maps, GLO maps and records and the water rights data base kept by the State Engineer's Office. These sources form an integral part of my work in identifying water rights on public lands and the scope and nature of those rights, both federal reserved and state-based appropriative water rights.

I conducted extensive field work to inspect various springs for which the BLM had filed claims for PWR in the Diamond Valley Adjudication proceeding in 1985. Other BLM hydrologists assisted in that field work which was reviewed by me prior to updating that information in response to the State Engineer's reinstatement of the Diamond Valley adjudication in 2015. Attached to this report is a spreadsheet (BLM Exhibit-029) filed with the State Engineer in this adjudication with data on each PWR 107 filed and a table (BLM Exhibit-028) providing additional information in support of BLM's claims and its objections to the Preliminary Order of Determination.

Opinion 1

Some of the PWRs discussed in Eureka County's (EC) Report (EC Exhibit No. 33) are not a direct source of water supplying downstream water rights as stated in the EC Report concerning BLM claims R-04249, R-04250, R-04251, R-04253, R-04254, R-04255, and R-04258.

Basis For Opinion

R-04249

R-04249 is located in T20N R54E section 3 (lot 3) on a spring within the Preston Creek drainage located in T20N R54E section 3. The spring is located on BLM land and it flows onto a private parcel (BLM Exhibit-003). According to EC's Report and the private land owner (Fitzwater Objection to the Preliminary Order) the spring has been fenced off since 1905 and the parcel was patented in 1914. The GLO map from 1905 (BLM Exhibit-001) shows the spring inside the homestead fence. The patented land includes lot 5 within section 3, which is a different configuration than drawn on the GLO map. The water right for the property is Permit 1937, Certificate 43, with a priority date of 1911. The original application stated the source of the water was "several small springs but mostly from snow water". An amended application was filed a month later listing the source as "Preston Creek" with a point of diversion along the creek upstream in section 2 and having an associated reservoir. (The original POD in the amended application was in section 1, it is assumed the map submission updated it to section 2) Below the POD, there are ditches leading to different irrigation areas and reservoirs on the private parcel. The spring

associated with R-04249 is not on the water rights map (BLM Exhibit-003). There is no indication that the water associated with the spring was being used to irrigate the private parcels or is part of the water right permitted for this POD.

R-04250

R-04250 is located in a side drainage to Sawmill Creek in T20N R54E section 12. The EC Report states that this spring is associated with Permit 2157, certificate 165, and Permit 2289, certificate 165, which claim all waters in Cottonwood Creek and its tributaries. The field visit by BLM on 05/16/2016, identified three meadows surrounding the trough and water piped to the trough but no spring expression was found. The area is on a bench in between two ephemeral channels which are tributaries to Sawmill Creek and eventually Cottonwood Creek. EC's report noted a similar description and that no spring expression was found. Permit 2157, associated with Red Rock Spring, is located 0.75 miles upstream of R-04250 and in the ephemeral channel. Red Rock Spring is situated in the headwaters of one of the ephemeral channels. Reviewing aerial imagery (BLM Exhibit-004), Red Rock Spring is contained to the immediate spring area, which is surrounded by riparian habitat and there is little to no riparian vegetation downstream. This would suggest that water from Red Rock Spring does not typically make it to the POD associated with Permit 2289. It most likely is lost to evapotranspiration. More than likely, any flow through these tributaries is due to snowmelt and precipitation runoff. The spring site associated with R-04250 is located up on a bench between two tributaries. If the assumption of the meadows feeding the trough is correct, it may also not be contributing directed to the POD. Similar to Red Rock Spring, it's unlikely that any spring flow from this area makes it way down to the POD.

R-04251

R-04251 is located in the upper headwaters of Sawmill Creek in an ephemeral channel. According to EC's Report, it is also associated with Permit 2289, similar to R-04250. Reviewing aerial imagery (BLM Exhibit-005), the spring is at the downstream end of what appears to be a complex of springs in the upper watershed. Below the spring, the channel is ephemeral for approximately 0.5 miles and then more springs are visible within the ephemeral channel. Between the two sets of springs, there is no riparian vegetation to suggest perennial flow and most likely, flow from the spring associated with R-04251 either does not reach very far downstream or suffers losses due to evapotranspiration and may go subsurface, which could surface lower downstream. Another 0.5 mile downstream, riparian vegetation in the channel increases and becomes more continuous, suggesting that this may be the spring source associated with the downstream POD. It is possible that any subsurface flow associated with the spring could surface again downstream. From a surface water view, it does not appear that flow from R-04251 contributes to Permit 2289.

R-04253 & R-04254

R-04253 and R-04254 are associated with a spring complex in the upper watershed of Hildebrand Creek. According to EC's report, these springs are associated with Proof of Appropriation V-02884, which claims Hildebrand Creek and all of its tributaries. Reviewing aerial imagery (BLM Exhibit-006), it appears that below the springs, the channel is ephemeral for approximately 1 mile and then a side tributary with springs flows into the main channel. Between the two sets of springs, there is no riparian vegetation to suggest perennial flow and most likely, the flow from the springs associated with R-04253 & R-4254 either does not reach very far downstream or suffer losses due to evapotranspiration and may go

subsurface. Another 0.6 miles downstream, riparian vegetation in the channel increases and becomes more continuous. This is the area where the POD for V-02884 is located. It is possible that any subsurface flow associated with the springs could surface again downstream. From a surface water view, it does not appear that flow from R-04253 & R-04254 contributes to V-02884, which is mostly likely solely supplied by snowmelt or precipitation runoff.

There are State Select lands adjacent to the spring area, but of a different quarter-quarter. According to the topographic map (BLM Exhibit-006), there is a spring located on the private lands, which is visible on the aerial imagery. Although those lands are now in private ownership, there is no evidence that at the time of the executive order in 1926 those lands were occupied, therefore, the spring was a valid PWR.

R-04255

R-04255 is located within the upper watershed of Cherry Creek, which is a tributary to Torre Creek. According to EC's report, it is associated with V-02888, which is a claim for Torre Creek. The POD for V-02888 is located over 2 miles downstream of R-04255, and the claim does not specifically state that it includes all of the tributaries nor are the tributaries drawn on the map. Regardless of whether or not the claim includes the tributaries or not, the spring is probably not the source for the POD. Reviewing aerial imagery (BLM Exhibit-007), below the spring, the channel is ephemeral for approximately 0.2 miles and there is a possible willow stand in the channel. Then is ephemeral again to the confluence with Torre Creek. On the aerial imagery it is difficult to discern where the actual confluence is located, suggesting that there is not contiguous flow from Cherry Creek into Torre Creek. Torre Creek also has several sets of springs throughout the watershed. It appears that the flow in Torre Creek becomes perennial just above the confluence from springs on Torre Creek. It is possible that any subsurface flow associated with R-04255 could surface again downstream. From a surface water view, it does not appear that flow from R-04255 contributes to V-02888, which is mostly likely supplied by the springs in Torre Creek as well as snowmelt or precipitation runoff.

R-04256

R-04256 is a spring and meadow complex with a trough at the lower of 2 meadows. According to the EC Report, BLM's coordinates are off by 210 feet and in the middle of a sage brush community as depicted by their photos. However, when plotted on GIS, the BLM location point shows up at the east end of the upper meadow (BLM Exhibit-008). EC's point is at the lower meadow where the trough is located. EC's point could be a second source spring to this complex area.

R-04257

R-04257 is on a tributary in the upper watershed of Nigren Canyon Creek. EC's Report suggests that BLMs claim is co-located with Permit 2789, certificate 307. Permit 2789 is a stockwater right on Nigren Canyon Spring, which is located in the quarter-quarter to the south of R-04257. Additionally, the notes on the certificate state the spring is being captured by reservoirs within 300 feet of the spring source, so there is no connection between the two springs or interference by each other's use. Reviewing the aerial imagery (BLM Exhibit-009), Nigren Canyon Spring has a much larger spring area than R-04257.

R-04258

R-04258 is located in the upper watershed of a side tributary to Pedroli Creek. Permits 7606 and 7607 are both for water appropriated on Pedroli Creek to be used in two different ditches downstream branching from the point of diversion. Neither permit specifically states that it includes all of the tributaries nor are they noted on the map, however, the map does show Black Point Spring as the source. Regardless of whether or not the permits include the tributaries, the spring is probably not the source for the POD. Reviewing aerial imagery (BLM Exhibit-010), the tributary where R-04258 is located is ephemeral for 0.3 miles to the confluence with Pedroli Creek where the confluence is 0.4 miles downstream of Black Point Spring. Black Point Spring appears to flow in the main channel for approximately 0.2 miles above the ephemeral reach. Following the creek downstream towards the POD, the whole channel appears to be ephemeral. It is possible that any subsurface flow associated with the springs could surface again downstream. From a surface water view, it does not appear that flow from R-04258 contributes to Permit 7606 and Permit 7607, which is mostly likely solely supplied by snowmelt or precipitation runoff.

Opinion 2

Some of the private water rights identified by Eureka County as being on the same source as a PWR are either erroneous applications or are incorrectly mapped – R-04260, R-04261, R-04262, R-04270.

Basis for Opinion

R-04260 and R-04261

R-04260 is located within Walter's Canyon in T22N R54E section 1 and on the USGS topographic map it is labeled "Potato Spring". EC's report states that there is an existing water right on Potato Spring, Permit 3018, Certificate 1242, which was filed in 1914. The permit was for irrigation and domestic use and the place of use was 80 acres in section 1 of T22N R54E. The GLO Map survey approved in 1939 (field work completed in 1936) (BLM Exhibit-001) shows a water trough in section 1 and a homestead in sections 11 and 12. According to the 1937 survey notes (BLM Exhibit-011), there were no settlers in the township with the exception of sections 11 and 12 where a cabin (ruins) is located. For section 1, the survey notes (BLM Exhibit-011) state that:

"Many of the deep draws heading in the main ridge or divide near the east boundary have intermittent seeps or small springs during late spring months or early summer and serve as watering places for the cattle and horses which use the range. One such spring has been developed by the erecting of a watering trough in the SE1/4 of the NW1/4 of Sec. 1. At the time of survey, a trail or crude road was being constructed up the bottom of the draw to the spring near the ¼ sec. cor. of sec. 36 on the east boundary. The water from this spring, when further developed, is to be used for mining activities in the west central portion of section 36."

For sections 11 and 12, the survey notes (BLM Exhibit-011) state:

"There were no settlers in the township at the time of survey, although a fenced area, along with a cabin and a corral, are situated in sections 11 and 12 in the bottom of the large draw. During normal seasons, water flows down this draw from its source near the west boundary to the above field. It does not appear to be of sufficient quantity for irrigation purposes."

After further investigation, the map for V-01901 shows a spring located in Walter's Canyon in T22N R54E section 1, called Valentine Walter's Spring. The map identifies a troughs and a creek flowing down towards a mineshaft labeled "creek in Walter's Canyon". According to the Preliminary Order, no documentation or chain of title was submitted for this claim and the State Engineer found it to be invalid.

These notes corroborate BLM's claim of a PWR at "Potato Spring" which is likely Walter Valentine's Spring. It is likely that Permit 3018 was either an erroneous permit or was surveyed incorrectly and should be located in sections 11 and 12 to the south. Since the survey notes from 1937 refer to a cabin in section 12 as 'ruins', the area was probably abandoned several years prior to the survey. Any claim to the homestead or the associated water rights were most likely abandoned prior to 1926.

R-04261 is located in Homestead Canyon in T22N R54E section 12. According to EC's Report, Permit 7549, Certificate 1472 is associated with the same spring as R-04261. The permit is for Maggini Spring No. 2 for stockwater to be used in section 12 T22N R54E and constructed with a pipeline and two troughs. There is a note on the permit of a correction of the POD location, but it is still located in section 12 of the same township. Reviewing the GLO Map from 1939 (BLM Exhibit-001), there is a homestead across the section line for 11 and 12. The survey notes (BLM Exhibit-011) from 1937 refer to it as "ruins of old stone cabin" and also note a "Wire fence, 3 strand" (This is also noted on the map for Permit 7868). The Master Title Plat and Historical Index (BLM Exhibit-002) show no DLE or homestead applied for in either of these sections and the Eureka County Assessor's Office shows the area as BLM managed lands (BLM Exhibit-011). The water right map (BLM Exhibit-011) and location description for Permit 7549 show the source in a different location than R-04261 as well as showing it is along Sheep Canyon. Reviewing the current USGS topographic map (BLM Exhibit-011), Sheep Canyon is located in sections 13 and 14. EC states in their report that there have been attempts to fix the location for Permit 7549, which according to the evidence, should be to sections 13 and 14, not sections 11 and 12.

Reviewing water rights in the area, it appears there is a locational shift between the 1910 era water rights maps and the 1939 GLO survey map. This shift makes the land descriptions of several water rights, 3018, 5160, 7548, 7549, 7868, and V-1327, incongruous with the GLO survey. It appears that the spring depicted as "Potato Spring" on the USGS topographic map in Walter's Canyon is actually Walter Valentine's Spring and water rights associated with "Potato Spring 1 and 2", 3018 and 7868, are located in Homestead Canyon. Water rights associated with 5160 and 7549 are located in Sheep's Canyon which is located in Sections 13 and 14 rather than in Sections 11 and 12. Similarly, 7548 and V-1327 are located in Monroe Canyon which is located in Section 24 rather than Section 14. BLM cadastral staff reviewed the water rights information within Walter's Canyon, Homestead Canyon, Sheep Canyon and Monroe Canyon and found inconsistencies that align with the findings above (Exhibit-027).

R-04262

R-04262 is located in the upper watershed of Water Canyon in T22N R54E S25. EC's Report associates this claim with Permit 2789, Nigren Canyon Spring located in T21N R54E S12. Given the location of the permit and the claim, it is clear that the two are not associated together (BLM Exhibit 12).

R-04270

R-04270 is located within Threemile Canyon in an unsurveyed section 25 of T23N R54E. EC's reports states that there are 2 existing vested claims filed on this source, V-01137 and V-01900. V-01137 has a POD at the bottom of the canyon and the original filing (BLM Exhibit-013) states the source to be "Springs in the mountain and snow water, principally snow water as the water from the springs sinks before it reaches the land". Reviewing the aerial imagery (BLM Exhibit-013), R-04270 appears to be at the upper end of a large riparian complex in the channel. The riparian vegetation extends down the channel for approximately 0.75 miles and then the channel becomes ephemeral. Following the creek downstream towards the POD, the whole channel appears to be ephemeral. It is possible that any subsurface flow associated with the spring could surface again downstream. From a surface water view, it does not appear that flow from R-04270 contributes to V-01137, which is mostly likely solely supplied by snowmelt or precipitation runoff.

V-01900 was cancelled by the NSE due to abandonment and the EC Report claims that based on notes by H.M. Payne from 1912 that there was potentially an active garden in the area. Reviewing the claim form (BLM Exhibit-013), it states that the land was patented. However, nothing is noted on the Master Title Plat or the Historical Index (BLM Exhibit 2) and the Eureka County Assessor's Office (BLM Exhibit-013) shows the entire section as BLM managed lands. Additionally, unsurveyed land cannot be patented and the entire section was part of the public land withdrawal for the Stock Driveways (1919) (BLM Exhibit-013), which withdrew the entire section from settlement. If there was patented land in the area when the Withdrawal was passed, the Withdrawal would not have included those portions and only identified the public lands. Given that the area was unsurveyed and there is no evidence to suggest that there is or was patented land in the section either through the Historical Index and Master Title Plat, Eureka County Assessor's Office or the Withdrawal which claimed the entire section, it is quite possible that either the 1912 field reconnaissance was completed in a different location, that this is an erroneous claim or that it is mapped in the wrong location. BLM cadastral staff reviewed the water rights information within Walter's Canyon, Homestead Canyon, Sheep Canyon and Monroe Canyon and found inconsistencies that align with the findings above (Exhibit-027).

Opinion 3

PWR claims rejected by the State Engineer due to low flow and/or being dry at time of measurement should be reevaluated and validated, including some that were invalidated due to overlapping vested claims.

Basis For Opinion

PWRS Rejected for having low flow or being dry

BLM submitted 66 claims for PWRs in the Diamond Valley Adjudication in 1985. When the State Engineer reopened the adjudication in October 2015 it prompted BLM to complete a field investigation on previously filed claims in the spring of 2016. In the Preliminary Order of Determination, the State Engineer rejected 21 PWRs for low flow and 5 for being dry. I have participated in several state adjudications and conducted field work and collected data in support of BLM's PWR claims. I am also familiar with BLM's various policy on water rights and PWRs in particular and have applied that policy in my work related to PWRs and filing claims with the State Engineer in adjudications.

Through my extensive work with PWRs and my hydrology education and experience, I have noted the following. A majority of the springs claimed by BLM as PWRs are characterized as mountain springs, which are located at higher elevations within mountain watersheds. These springs are associated with local flow systems and characterized by relatively shallow and localized flow paths. Local springs are typically low volume, tend to have temperatures similar to ambient atmospheric conditions and have flow rates that fluctuate over short time-scales in response to local precipitation (BLM, 2012). As such, these springs tend to be more sensitive to changes in local climatic conditions and have flows that often vary seasonally and may even go dry at different times of the year.

Although many of these springs are not perennial sources of water, they do play an important role in BLMs multiple use and sustained yield mission. The primary purpose of a PWR is for livestock and domestic use (although BLM acknowledges that wildlife are also a user of these sources). The basis as to whether or not a spring qualifies as a PWR is not based on its flow rate but whether or not it is considered important. Nevada is the driest state in the nation and typical springs and water holes on public land are small and vary in flow, particularly during times of drought. Given the climatic challenges within the State, springs on public lands are particularly important. The more scarce the water sources and quantity produced at each source, the more important these water sources become. In order to meet the water needs for appropriate livestock management on public lands, multiple sources are needed in an area in order to supply a sufficient quantity. Having PWRs available for livestock use protects permittees by ensuring that there is water available for use and allows for better distribution of livestock across the landscape.

BLM field reconnaissance of the PWR claims for the Diamond Valley reinstated adjudication took place in April and May of 2016. The BLM would have preferred to complete the investigation at a later date, but BLM's request to the State Engineer for a 6-month extension of time was denied. As noted in the EC Report, 2016 was a high precipitation year, having one of the largest winter precipitation totals on record for Diamond Peak SNOTEL and above average precipitation for April and May. The purpose of BLMs investigation was to reevaluate the claims and collect specific data that the State Engineer would request. In contrast, the EC field reconnaissance was completed in October 2018, where 2018 water year had one of the smallest snow packs on record for Diamond Peak SNOTEL. Both made observations and took flow measurements at completely different hydrologic periods of the year and at opposite ends of the precipitation range for the area.

Prior to the 2016 field investigation by BLM, most of Nevada had been in a severe drought. Beginning at the end of 2011 and lasting until early 2016, over 60% of Nevada was classified as being in some state of moderate to exceptional drought (NDMC, 2019). Nearly all of Eureka County, NV was classified as being in moderate to extreme drought for roughly the same timeframe (NIDIS, 2018). As a result of the extended drought, many springs on public lands experienced extreme low flow conditions or were dry during this period. 2016 brought huge relief to the drought conditions as it was one of the wettest over the previous 30 years.

Because these springs are fed by local flow systems they are dependent on local recharge from precipitation, particularly precipitation during the winter months (November thru March). Winter precipitation is more likely to have a greater influence on groundwater recharge than precipitation that occurs during the summer (Jasechko et al., 2014). The timing of precipitation is an important component of groundwater recharge. Winter precipitation in higher elevations often comes in the form of snow and

can accumulate over the winter months. As these packs melt during the spring, the slow release of water is able to infiltrate the soil and percolate through the vadose zone with less potential for loss due to evaporation or transpiration as compared to summer rains. Lag times for these springs can vary depending on the geologic structure and storage area for each spring.

Reviewing climate data from the local AgriMet Station in Eureka, NV, it appears that for total precipitation for the year, the area only experienced lower than average precipitation in 2012 and 2013. Both 2014 and 2015 show higher than average total precipitation. (Figure 1.)

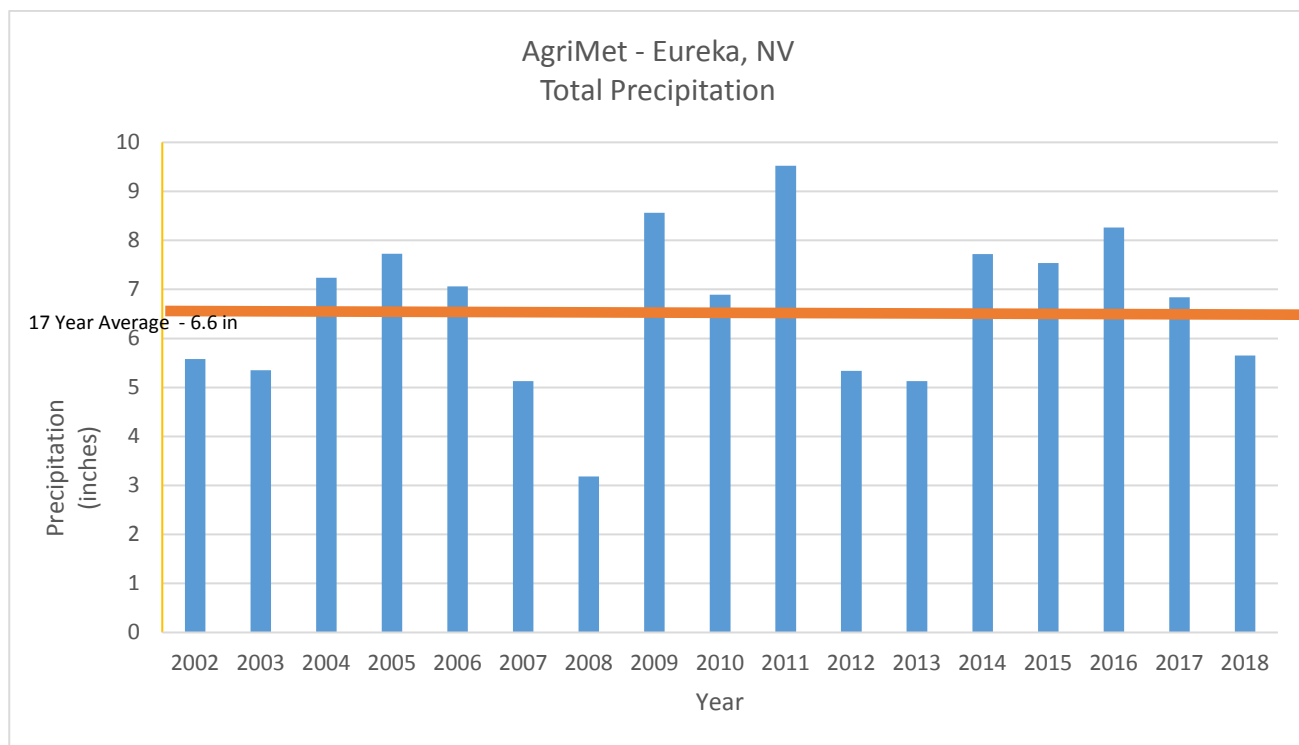


Figure 1. AgriMet Station Eureka, NV - Total Precipitation for period of record.

However, splitting up the year into winter precipitation and summer precipitation shows less than average precipitation from 2012 to 2015 during the winter (Figure 2). This time period has the most consecutive years of below average winter precipitation over the period of record for the station.

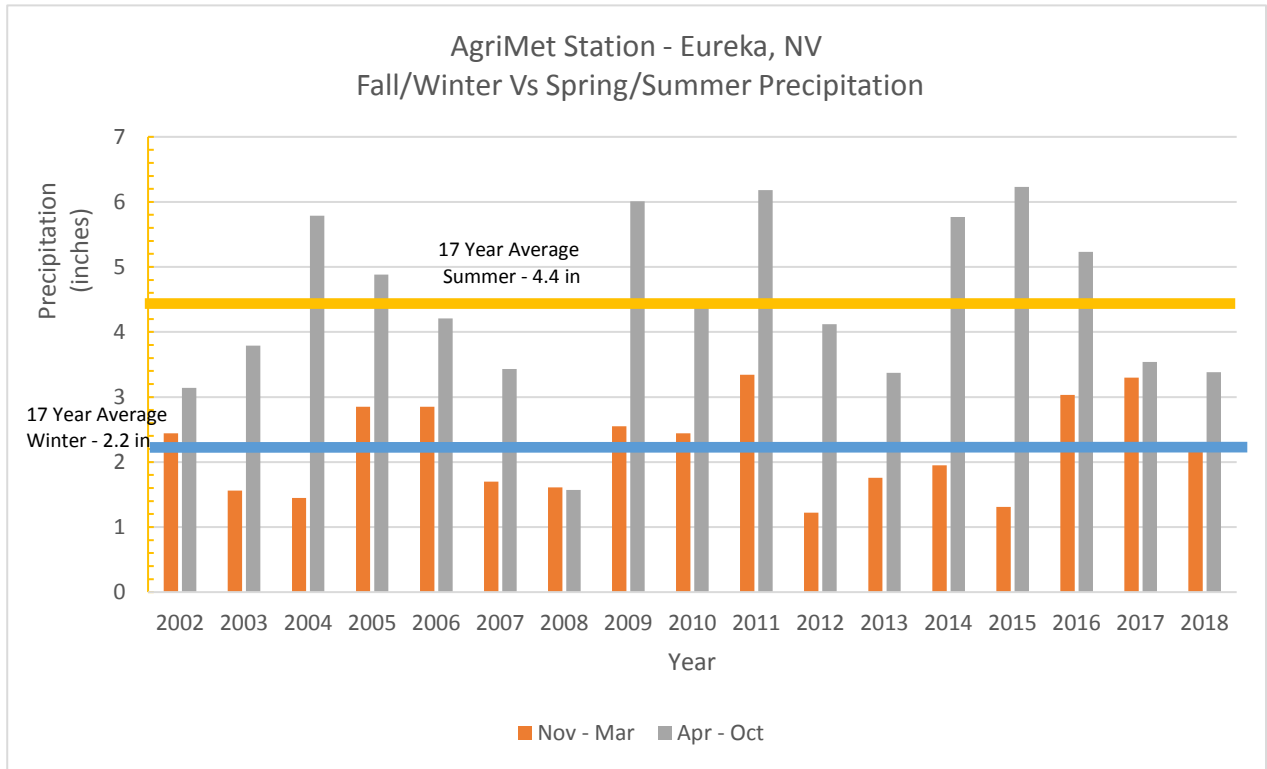


Figure 2. AgriMet Station Eureka, NV – Winter Vs Summer Precipitation

Reviewing data from the Diamond Peak SNOTEL Site, the averages for winter vs summer precipitation are about the same. From 2012 to 2015, with the exception of winter precipitation in 2013, precipitation in general was below average (Figures 3 &4).

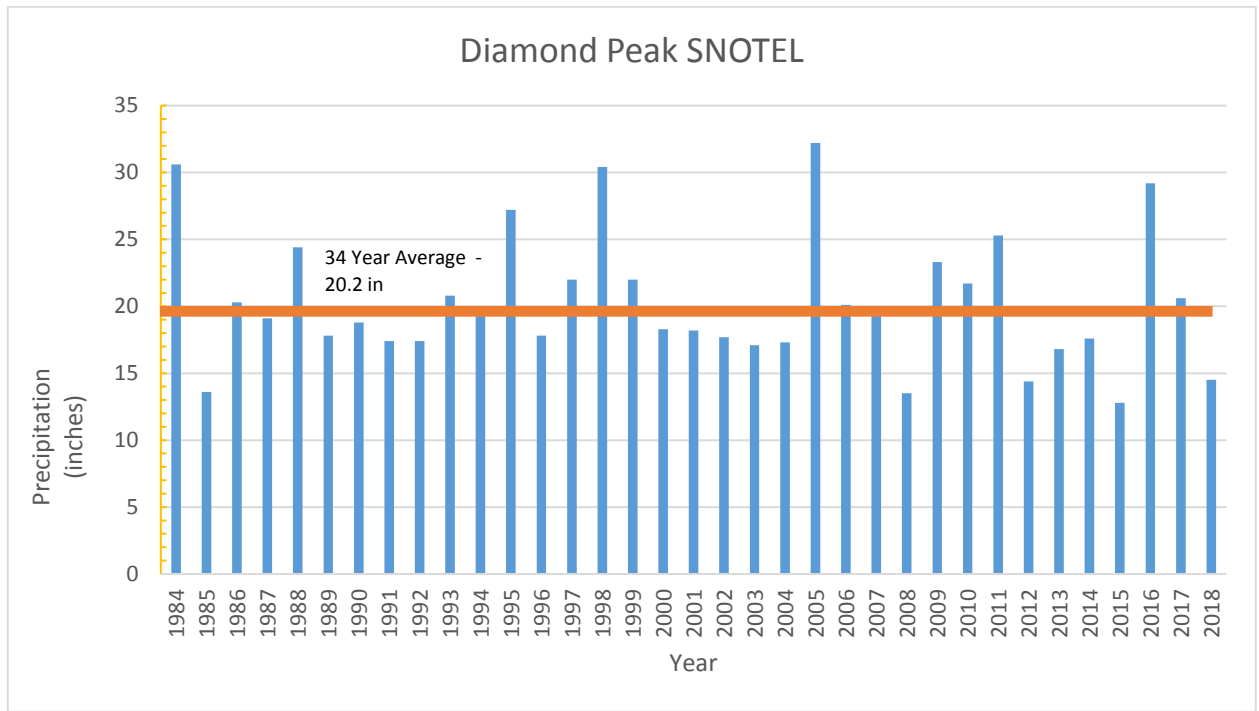


Figure 3. SNOTEL – Diamond Peak – Total Precipitation

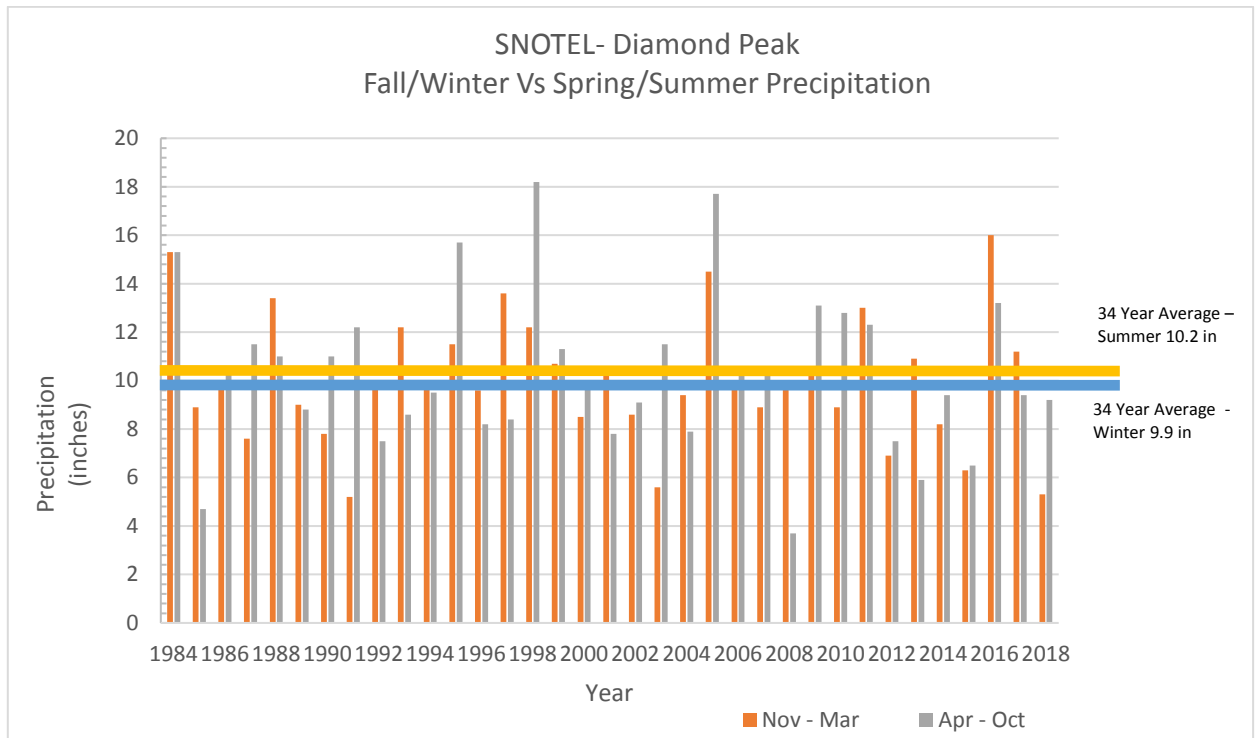


Figure 4. SNOTEL – Diamond Peak – Winter Vs Summer Precipitation

Given the known drought conditions throughout the State and the lower than average winter precipitation over the four years preceding the 2016 Field Investigation, it is very likely that many of the springs that were found to be dry or have low flows were more impacted by the extended drought.

Depending on the spring’s characteristics and the subsurface storage of the area contributing to its flow, it could take multiple years of above average precipitation before recharge is sufficient to regenerate spring discharge. It is not surprising that Eureka County found many of the springs to be dry or experiencing low-flow conditions when it performed its field investigation on BLM PWRs in October 2018. These measurements were made during a substantial drought year having one of the smallest snow packs of the 34 year record at Diamond Peak SNOTEL station (figure 5).

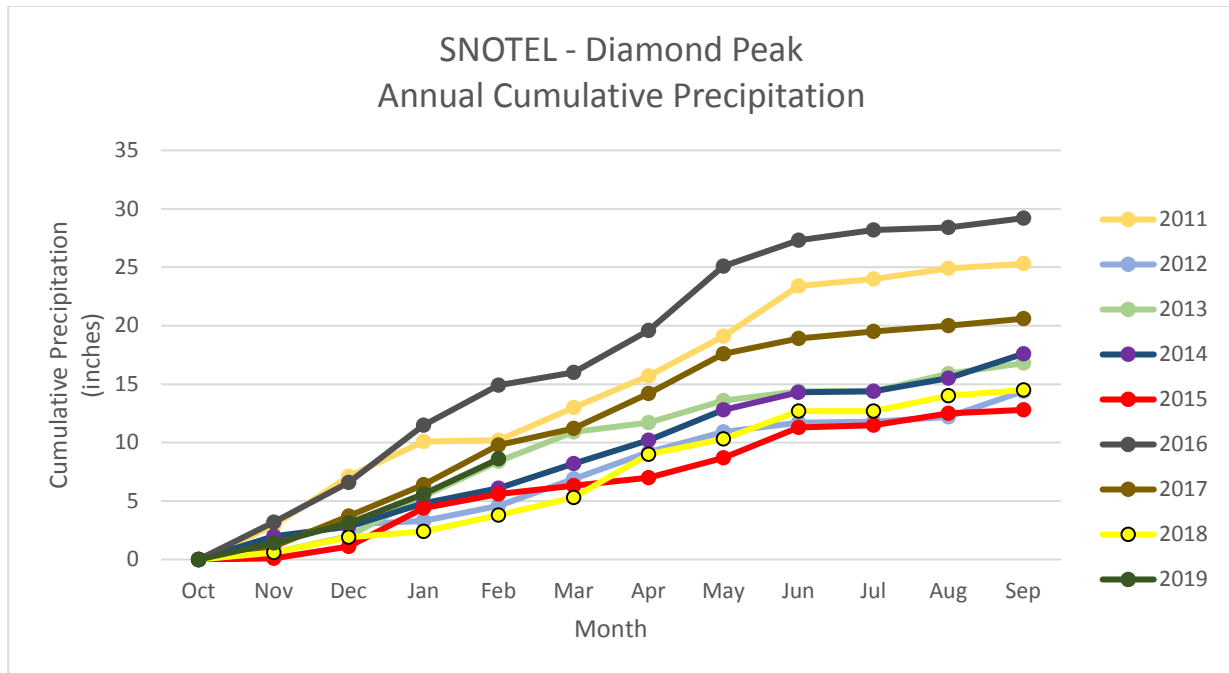


Figure 5. SNOTEL – Diamond Peak – Annual Cumulative Precipitation

A few of the claims rejected are located lower in basin near or on the valley floor. Given the known groundwater pumping related drawdowns in the basin, it is possible that the lowering of the water table resulted in the observed low-flow conditions or the springs going dry.

Additional evidence regarding the variability of these spring’s flows and their importance is their development. Many of the springs have existing troughs and pipelines. Such an expenditure of funding and time to develop these water sources suggests that the spring is, at times, a viable water source worth the investment. As several of the spring developments infrastructures were not functioning properly, it is possible that the disrepair of the infrastructure is resulting in apparent low flows.

PWRs Rejected for being Fully Appropriated

In the Preliminary Order of Determination, the State Engineer rejected 16 PWR claims that overlapped with vested claims stating that the sources were fully appropriated and there was no water available for the PWR. These PWRs include: R-04232, R-04234, R-04235, R-04240, R-04242, R-04245, R-04246, R-04247, R-04268, R-04275, R-04516, R-06743, R-06937, R-06938, R-06941, and R-06944.

The purpose of a PWR is for livestock and domestic use for the minimum amount necessary to fulfill the needs of the reservation. The amounts claimed by BLM for use as PWRs is minimal and is for the same purpose as the vested claims, therefore, there is no conflict between the vested claims and PWRs. The State Engineer has concluded in previous rulings that the issuance of stock water rights to an authorized range user is not in conflict with the primary purpose of a PWR. Given the variability of flow, including seasonal variations, it is possible that in some years and during different times of the year, there may be water available above the vested claim for use. In those years, a junior PWR right would be in priority. When the flows are lower and only able to meet the needs of the vested claim, the holder could make a call for all of the water. Additionally, the Preliminary Order does not provide sufficient evidence to support a finding that the vested claim fully appropriates the source either today or in 1926 and whether the vested claim consumed the entire quantity or if water was still available for use by others under a valid PWR claim.

Use of the vested claims by permittees is subject to the terms and conditions of the grazing permit. Grazing use on the allotments is not year-round. Instead, the permits identify an overarching timeframe in which livestock can use the allotments and then each yearly permit identifies the specific on/off dates and pasture rotation for the year. As such, water would be available for public use during the time periods outside of those designated by the permit. Having a PWR available on the sources during times outside of the permit would allow the water to be put to beneficial use year-round.

Reviewing the grazing permits for each of the different allotments associated with a PWR rejected for being fully appropriated, the BLM has determined that water would be available at these sources outside of the timeframes of the grazing permit (Exhibit-025).

Opinion 4

Eureka County's assertion of elevated flow due to high snow year and active precipitation and most of the measurements taken by BLM were in ephemeral systems should be disregarded, since EC measurements were taken during the driest time of the year and during drought conditions.

Basis for Opinion

Eureka County's Report, repeatedly refers to BLM's 2016 measurements of spring discharge as "artificially inflated due to the higher than average precipitation and runoff" during the time that BLM was in the field. As shown in the figures above, 2016, was an above average year for precipitation in the Eureka, NV area. BLM recognizes that measurements were made shortly after peak snowmelt for the year, when soil moisture was likely high, and does not dispute that the spring discharges may have been near their peak for the year. However, given that the BLM surveys were conducted following four years of severe drought, it is also more than likely that the measured flows were still recovering and not at the peak discharge rates yet. At the time of the surveys (in April and May) recharge from snowmelt had not yet fully reached the spring discharge points. This usually occurs later in the year during the early summer month. BLM rejects claim of inflated spring discharge due to measurements incorporating overland runoff of snowmelt or precipitation. While storms did occur on a few of the field days in April, rain was not encountered at the majority of measurements sites. Measurements were made at two sites (R-06743 and R-06943) on the afternoon of April 13th where the most significant rainstorms were

encountered. Neither of these measurements were impacted by the rains. Rain began falling halfway through the BLM discharge measurements at R-06743, so any potential for overland flow or active precipitation to inflate the measured value would have been negligible. At R-06943, rain fell during the entire visit. However, due to the ponded nature of the site, only a non-quantitative visual estimate of spring discharge was made. Nothing more than light, sporadic rain was encountered during the remaining field visits, which was high enough in intensity or duration to cause overland flow.

Other than the two sites referenced above, there was not enough active snowmelt or precipitation occurring to result in overland flow issues at any of the other PWR springs that were measured by BLM.

Active snowmelt contributing to overland runoff was not observed during field visits to make spring discharge measurements. Patchy, sporadic snow was observed at higher-elevation spring sites with snow mostly absent at lower elevation spring sites. R-04254 was the only spring that could have been directly influenced by snowmelt. There was snow over part of the spring, however, it is unclear if there was any direct overland flow impact. While it is possible that a few of the developed springs draining a storage reservoir or pond could have been influenced by collecting recent runoff from snowmelt or rain, this was not observed. Patchy snow was observed uphill of the spring at site R-04233 where relatively high flow was measured. However, no overland runoff was observed that could have contributed to the high flow measurement.

Instead I would recommend that the EC measurements conducted in 2018 should be disregarded as they were conducted during the driest time of the year and during drought conditions. EC performed its reconnaissance, in a below average year for precipitation. Combining the low precipitation with the timing of the measurement at the turnover of the water year, it is expected that these measurements would be considerably low. EC's Report suggests that the appropriate time of the year to measure flows for water right considerations is during base flow conditions. Given the flow variability of these sources, this is an unrealistic standard, particularly since most of the vested claims and appropriated rights for the same type of sources are for the higher than base flow discharge. The two investigations (measurements made by BLM in the spring of 2016 and by EC in the fall of 2018) represent the extremes of the hydrologic range for these systems. Ideally, investigations to support PWR applications would represent average conditions with respect to precipitation and annual discharge.

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