

2024 Seasonal Water Supply– Retrospective

Prepared: May 16, 2025, Portland Water Bureau

Summary

The 2024 Seasonal Supply year provided challenges in managing the drinking water system to meet the needs of all customers.

- 2024 saw a fairly **average winter snowpack**. The start of snow accumulation in the watershed was delayed, but January snows brought the snowpack up to average; spring melt out occurred at average timing.
- Overall precipitation was near average for 2024, however the spring saw a warm-dry period in March and April followed by above average May and June; overall conditions resulted in a **slightly early start to drawdown on June 28**.
- Summer 2024 had below average precipitation and above average temperatures, **resulting in below average streamflow**.
- The continued warm and dry weather into September lead to a **groundwater augmentation run** to meet demands until fall rains in late October.

Weather

The accumulation of substantial snowpack during the snow season of 2023-24 started in early January, lagging behind the historical average by roughly a month. This brought the snowpack to near average numbers in early January. A following period of modest snowmelt and further accumulation in later January and into February, snow levels were relatively close to average for the remainder of the season. Snow water equivalent (SWE; the depth of liquid water if the snowpack were completely melted) values were very close to average during the snowmelt period in April and May. Figure 1 shows snow water equivalent at the three snow monitoring sites in the watershed.

Precipitation during 2024 was, overall, slightly above average at Headworks. Total rainfall for the calendar year was 82 inches at Headworks, 102% of annual average rainfall from 1899-2023. Wetter than average months of May and June transitioned to a drier than average summer. Substantial rains returned in the latter half of October. Figure 2 shows monthly precipitation at Headworks for 2024.

Demand

Historic winter base demand (November – March) peaked between 1979 and 1991 at an average of approximately 100 million gallons per day (MGD). Since then, winter base demand has declined, with demand over the past 5 years approximately 20% lower at an average of about 80 MGD. In 2024, annual average demand was 91 MGD, lower than the previous 5-year average of 93 MGD. Figure 3 shows demand from 2024 and the preceding five-year average. These demand numbers reflect the total amount of water supplied to Portland retail and wholesale customers and are not equivalent to the total amount of water that is metered and billed.

Bull Run Supply

Consistent drawdown of the Bull Run Reservoirs began on June 28, which is slightly earlier than the historical average onset of drawdown in early July. The reservoirs reached their minimum storage on

October 26, when 1.6 (16%) of 9.9 billion gallons (BG) of usable storage remained in the reservoirs. The reservoirs completed filling on November 17. Figure 4 shows the 2024 drawdown of the Bull Run Reservoirs.

Groundwater Use

Each year, the Portland Water Bureau (PWB) operates the Columbia South Shore Well Field to exercise equipment and identify repair needs. The groundwater maintenance operation was conducted between August 1 and August 20, 2024. A total of 239 MG of groundwater were blended with Bull Run surface water for approximately 10 hours a day Monday through Friday. Groundwater was also operated to supplement Bull Run supply between October 10 and November 6 due to lower-than-normal water levels in the Bull Run Reservoirs. The 28-day supply operation produced a total of 0.821 BG of groundwater which equated to between 25% and 45% of daily demand.

During 2024, Production Well (PW)6 was returned to service, leaving all production wells available for most of the season. In September, PW16 was pulled out of service for several weeks for repairs. During the supply run in October PW6 began producing excessive sand and has been taken out of service. PW37 was also showing electrical issues has been taken out of service.

Groundwater Use Model

The Groundwater Use Model was run in the spring of 2024 before drawdown began. The model does not incorporate weather forecasts and is therefore run only once each year. Subsequent application of the Groundwater Use Model involves comparison of the actual course of drawdown to the groundwater pumping curves generated by the model. Figure 5 shows the groundwater pumping curves that were developed, along with the actual reservoir volumes that were observed during the drawdown season. During drawdown, if the actual storage volume in the Bull Run Reservoirs drops below a groundwater pumping curve, then the pumping rate corresponding to that curve is recommended to augment supply.

Instream Flows and Fish Habitat Management

PWB managed water releases downstream of Bull Run Reservoir 2 to meet minimum flow requirements and water temperature targets for the lower Bull Run River, which are required by the Bull Run Water Supply Habitat Conservation Plan (HCP).

Per requirements as defined in the HCP, lower Bull Run flows stayed at or above 120 cubic feet per second (cfs) January through May. On June 22, 2024, tributary inflows dropped below combined outflows to town and downstream, resulting in the beginning of drawdown. Downstream releases were reduced according to the normal spring flow commitments of Measure F-1 of the HCP, maintaining reservoir levels near capacity until June 28, after which reservoir storage drew down consistently through the summer. From July through September, summer flow minimum requirements of 20 cfs were observed. Summer flow releases were actively managed each day to meet the water temperature goal of keeping the 7-day average daily maximum water temperatures measured at Larson's Bridge, below the temperature target, which moves according to temperatures observed at the Little Sandy River. August and September cumulative tributary inflows to Bull Run reservoirs were below the tenth percentile of historic flows, which allowed for implementation of reduced flow releases in October and November. However, normal fall flows per Measure F-1 of the HCP were implemented starting October 1. Minimum downstream flows were a percentage of tributary inflows for the all of October and November. In December, minimum flows returned to 120 cfs.

PWB met the HCP downstream water temperature targets for 2024 with the exception of a period of time in the fall. Figure 7 shows the temperature of the Lower Bull Run River. During the temperature

management season, PWB presented the 2024 water temperature information to the Oregon Department of Environmental Quality, the National Marine Fisheries Service, and the Oregon Department of Fish and Wildlife.

Cold-water Transfer

In 2024, PWB completed a cold-water transfer to move the bottom-most cold water from Reservoir 1 downstream into Reservoir 2, where it was available for release to town or downstream. The transfer started on August 2 and continued through September 10, releasing a total of 4.9 BG of bottom water from Reservoir 1 via the Dam 1 fixed cone valves (using the 895' elevation gates) into Reservoir 2. The temperature effect of these releases was most apparent in the upper and middle elevations of Reservoir 2.

Water Efficiency and Conservation

Water Efficiency programs and services continue to be one component of Portland's approach to meeting customer water use demands. Programs available in the 2024 supply season included:

- Distributed water saving devices and information through community events, partner workshops, and customer requests.
- Provided rebates to replace inefficient toilets with WaterSense labeled toilets for residential, commercial, and multi-family customers.
- Provided rebates to replace an irrigation controller with a WaterSense weather-based model in addition to rebates for retrofit of efficient sprinkler nozzles.
- Provided rebates to commercial customers to replace water-cooled equipment and to support other water efficiency projects.
- Published a Customer Newsletter with water conservation information that was included in all bills that were sent out in the summer.
- Income-qualified customers received critical leak repairs through the Water Leak Repair Program. PWB partners with the African American Alliance for Homeownership (AAAH) and Community Energy Project (CEP) to fund repairs. Eligible customers received repairs or replacement of service-lines, toilets, faucets, in-home pipes, outdoor spigots, and inefficient clothes washers.
- Data logging and on-site water use assessments for commercial and large multi-family customers.
- Community engagement and outreach through workshops and participation in community events including Community Services Network Resource Fairs, Jade Night Market, Sunday Parkways, and collaboration with the ReBuilding Center on DIY plumbing workshops.
- The PWB is a member of the Regional Water Providers Consortium (RWPC), and an active participant in the Conservation subcommittee. The bureau achieves public education and communication goals through the RWPC's regional conservation programming. Below is a summary of key offerings completed in Summer 2024:
 - The summer water conservation campaign ran in English and Spanish from June through September. Campaigns ran on television, radio, social media, and several other online platforms. Messaging focused on indoor and outdoor water conservation, emergency preparedness, and source water protection.

-
- Summer outreach messaging was also distributed through the RWPC’s website www.regionalh2o.org, social media, and through Spanish language media partners.
 - Provided the Weekly Watering Number (WWN) on www.regionalh2o.org and via a weekly listserv, and text message from April-September. The WWN is the amount of water in inches to apply to lawns and gardens based on local weather conditions and evapotranspiration.

Curtailment and Contingency Planning

PWB’s 2020 [Water Management and Conservation Plan](#) outlines the process to be followed if a curtailment action was necessary. The Water Manager’s Advisory Board also has a curtailment plan which guides how curtailment would work for PWB wholesale customers. Curtailment is a call to action for all water users to reduce water use with three levels of urgency. Building off the learning from the Camp Creek Fire response preparation in 2023, PWB continues to plan internally and with regional partners in case of a curtailment event.

Conclusions

During the 2024 supply season, PWB was able to meet all in-town and in-stream demands using its baseline resources—Bull Run Reservoirs, streamflow, conservation, and groundwater. Several key points from the supply planning season:

Groundwater

As captured above, groundwater was instrumental in meeting system demands in 2024 with a supply augmentation run of 18 days contributing 0.823 BG of groundwater to supply. Issues at PW6 and PW37 have left these two wells out of service.

Demand

Demands were near average for most of 2024, with a short period of increased demand in January due to service line and main breaks after an ice storm. The extended dry fall weather also saw slightly increased demand into the fall before fall rains in late October reduced demands close to average.

In summary, the bi-weekly meetings of the Supply Planning Group were integral to the successful management of supply operations. The group balances multiple objectives to ensure a reliable high-quality water supply for all users while effectively managing costs.

Figure 1. Snow water equivalent (SWE) at snow telemetry (SNOTEL) monitoring sites in Bull Run during Water Year (WY) 2024

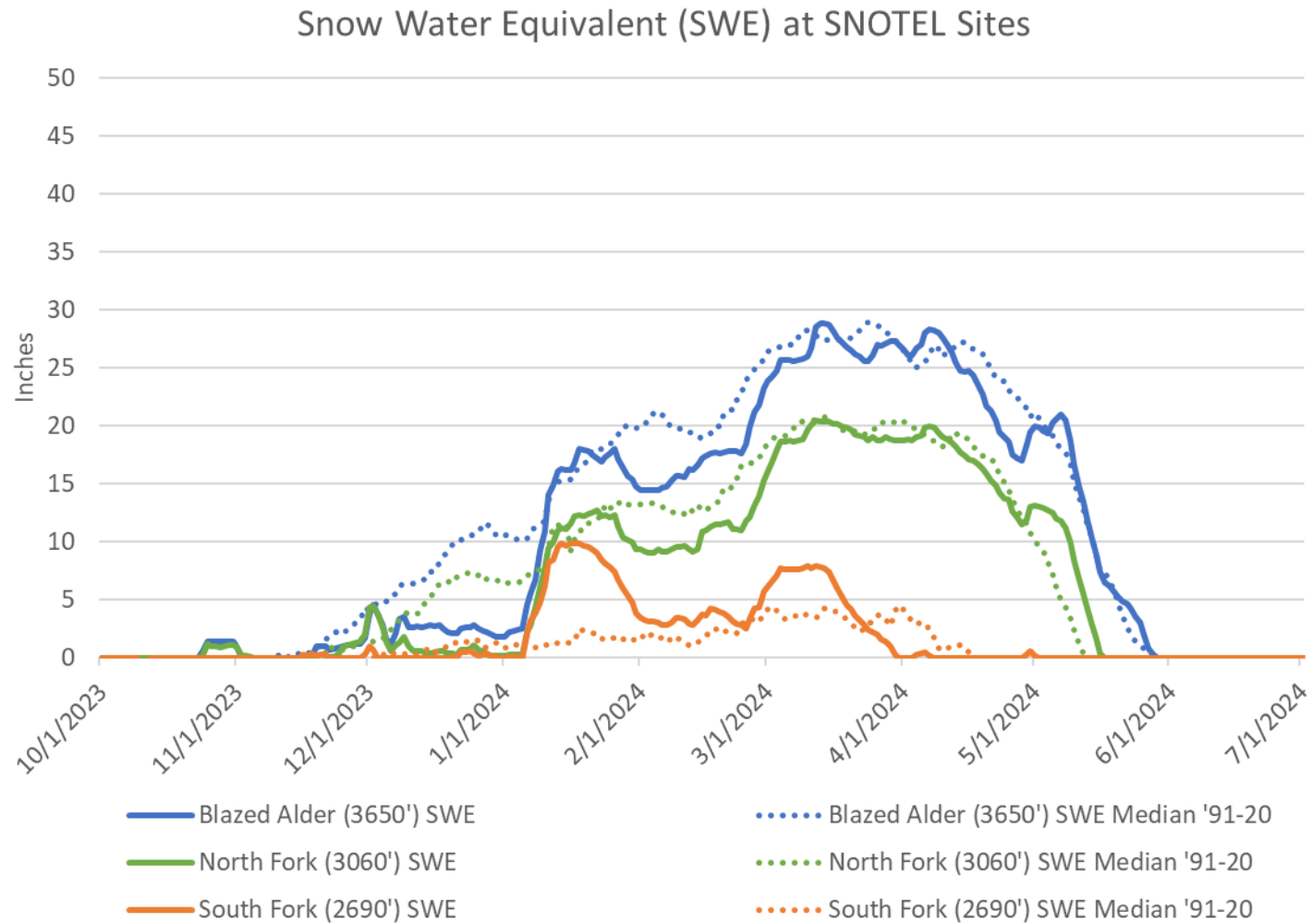


Figure 2. Monthly precipitation totals at Headworks in 2024 compared to long-term medians

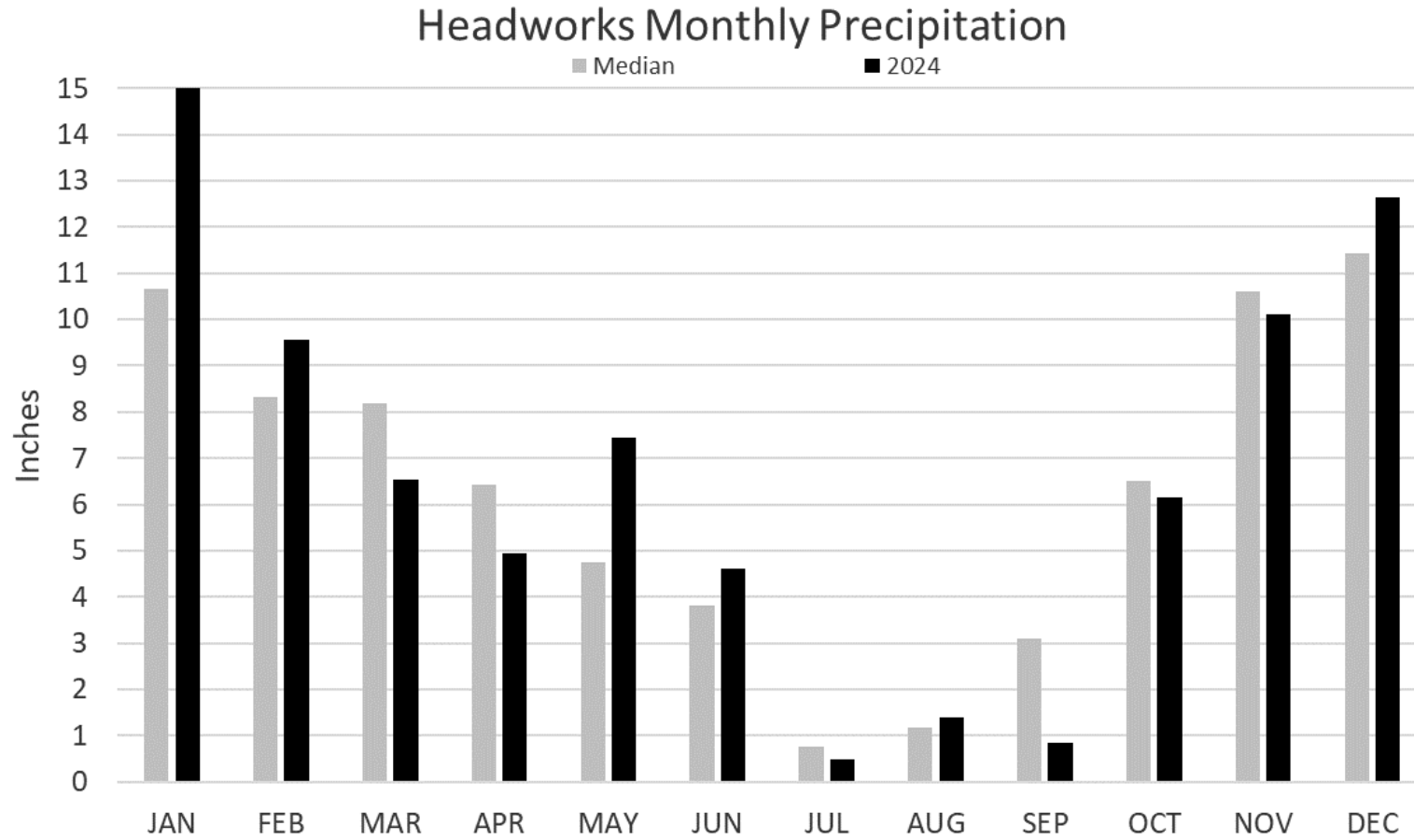


Figure 3. Production demand in 2024 compared to the previous five years average

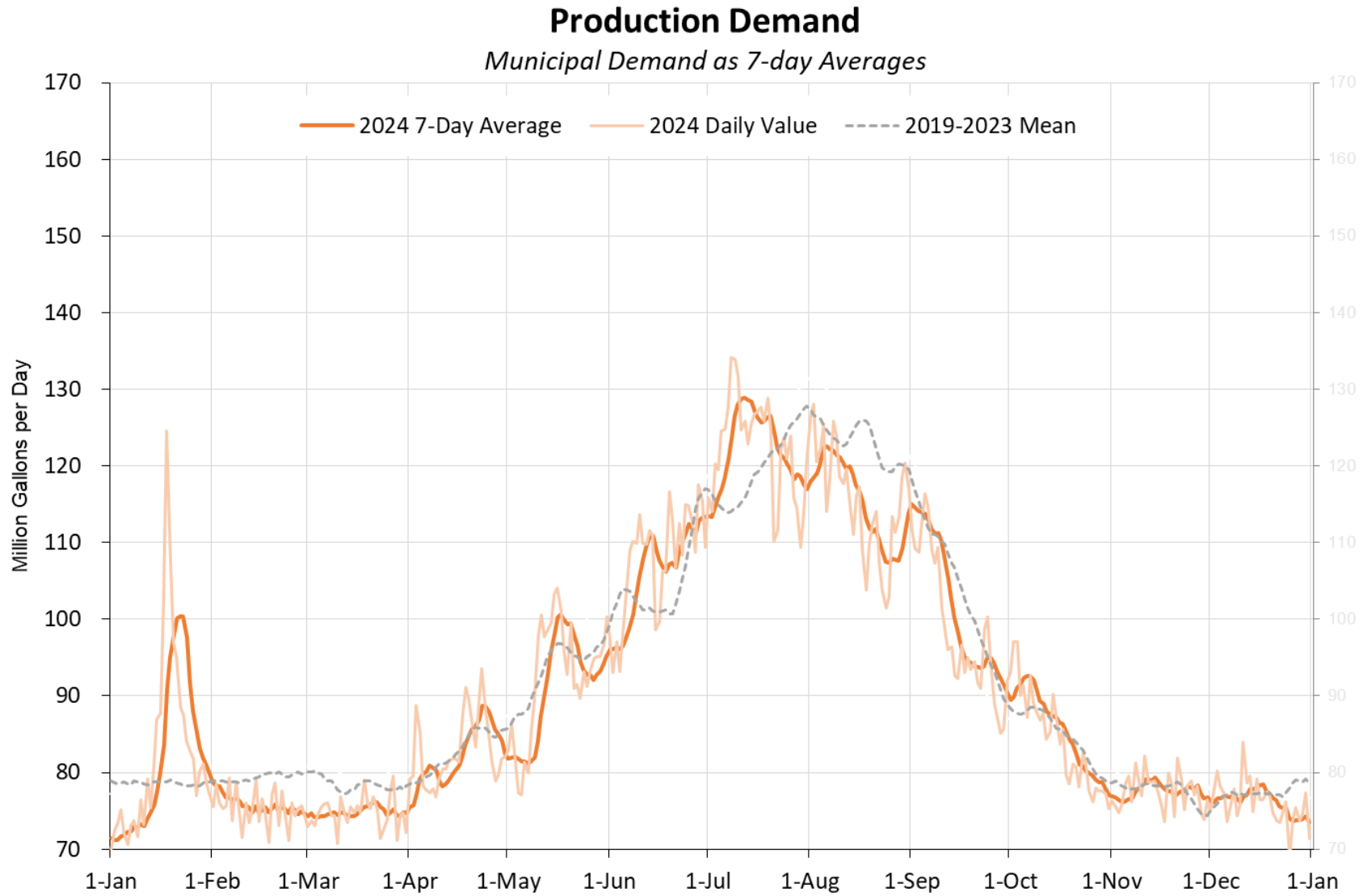


Figure 4. Bull Run Reservoir total usable storage in 2024, showing drawdown and refill

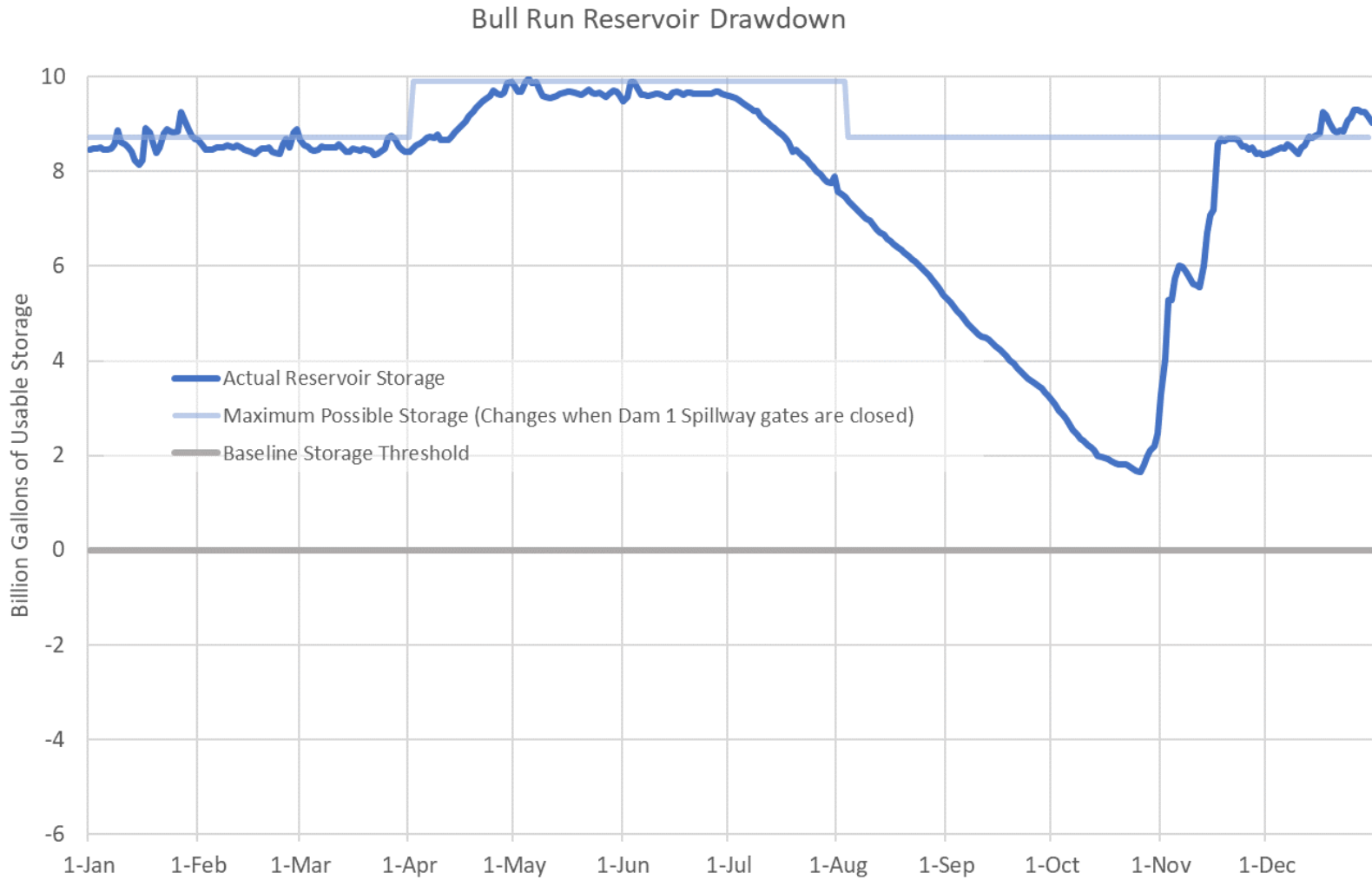


Figure 5. Bull Run Reservoir total usable storage in 2024 with modeled groundwater pump rates

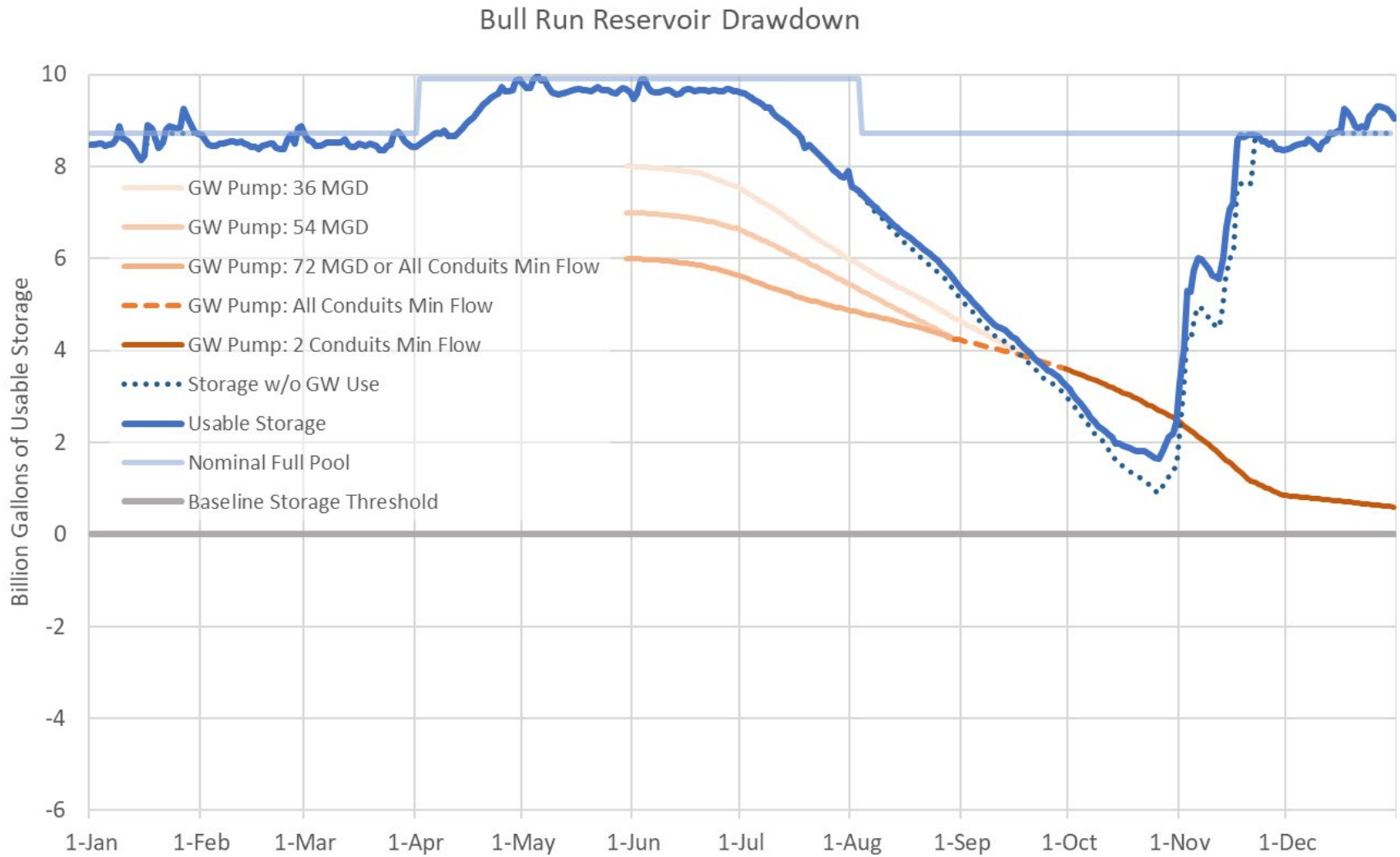


Figure 7. Water temperature of the Lower Bull Run River, May-November 2024

