



12/22/22

MEMORANDUM

TO: SALLAL WATER ASSOCIATION
FROM: MIKE JOHNSON, P.E.
DATE: DECEMBER 22, 2022
SUBJECT: WATER CONNECTION ASSESSMENT
SALLAL WATER ASSOCIATION,
KING COUNTY, WASHINGTON
G&O #22616.00

INTRODUCTION

On June 21, 2022, the Sallal Water Association (Sallal) instituted an emergency interim moratorium on new water connections because the water system appeared to be nearing its capacity. Currently, the limiting factor for the water system is the annual water right capacity limit of 696 acres/feet per year (226.8 million gallons (MG) per year). Based upon water usage in 2021 and projected water demands from approved, but not yet connected developments, it appeared that the water system would be approaching this limit. Since this time, Sallal has undertaken a number of efforts to better understand its current water demands and projected demands from committed connections. Sallal tasked Gray & Osborne with reviewing historical water production and consumption data to identify any anomalies as well as verify production and consumption data over the last several years. In parallel to this effort, Sallal staff have been working to verify and minimize operational water uses in the system (flushing, sampling, and maintenance uses). Sallal staff have also been working to confirm the accuracy of water source meters at the Sallal wells. This memo is intended to summarize the efforts to date, and to provide information to assist the Sallal Board with deciding how to move forward with the emergency interim moratorium. This memo finalizes a previous draft issued on December 19, 2022 to Sallal's counsel which was reviewed and discussed by the Sallal Board in executive session at the December 20, 2022 Board Meeting.

REVIEW OF WATER PRODUCTION AND CONSUMPTION DATA

Gray & Osborne reviewed detailed water production and consumption data for 2020, 2021, and 2022. Our review of the water production data correlated fairly well with the data that Sallal has been collecting and tracking on an annual basis. The primary differences that we found centered around the timing of meter readings used (whether at the end of the month or around the 20th of the month when service meters were read). We also found some discrepancies with how meter readings that fell on weekends or



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holidays were addressed. Table 1 summarizes the total water production data based on our review.

TABLE 1

Water Production Data Comparison 2020 – 2022

Year	Baseline Production (MG)	Gray & Osborne Adjusted Production (MG)	Difference (MG)
2020	195.38	194.17	(-1.21)
2021	212.91	212.08	(-0.83)
2022	168.19	170.98	2.79

Note: 2022 data is only through September 2022.

Our review of the water consumption data found more significant differences with the consumption data that was being generated from the billing system, particularly in 2020 and early 2021. The primary differences centered around how the billing system handled meter change outs. When meter change outs occurred in 2020 and early 2021, the billing system would generate multiple entries that would sum together and skew the total consumption for those months. This review and adjustment resulted in a significant difference in the water consumption for 2020. Table 2 summarizes the total water consumption based on our review.

TABLE 2

Water Consumption Data Comparison 2020 – 2022

Year	Baseline Consumption (MG)	Gray & Osborne Adjusted Consumption (MG)	Difference (MG)
2020	201.63	169.54	(-32.09)
2021	183.12	183.36	0.24
2022	142.53	142.50	(-0.03)

Note: 2022 data is only through September 2022.

Table 3 summarizes water consumption and production data for 2020 through 2022, as adjusted by Gray & Osborne. Table 3 also includes other known consumption from operational water uses such as flushing, sampling, and water loss from main breaks. It should be noted that for 2020 and 2021, operational water uses for flushing and sampling were largely estimated. In 2022, Sallal began metering and implemented better tracking of these uses. Sallal also found ways to optimize these uses in 2022.



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Sallal recently removed the water source meters for Well 1 and Well 2, and sent them to the factory to be calibrated. The meter for Well 2 was determined to be reading accurately; however, the meter for Well 1 was determined to be over reading by 8.5 percent. It is not clear how long this had been occurring, but we understand that the meter was installed in 2018 or 2019. If it is assumed that the meter was over reading by 8.5 percent since 2019, the production data for Well 1 can be adjusted down by 8.5 percent for the analyzed years of 2020 through 2022. Table 3 shows the water production, consumption, and distribution system leakage (DSL) percent for 2020 through 2022 with, and without the adjustment to Well 1 production data.

TABLE 3

Impact of Well 1 Correction 2020 – 2022

Year	Production (MG)	Production with Well 1 Correction (MG)	Consumption (MG)	Other Known Consumption (MG)	Percent DSL	Percent DSL with Well 1 Correction
2020	194.17	183.22	169.54	2.80	11.2%	5.9%
2021	212.08	201.66	183.36	3.91	11.7%	7.1%
2022	170.98	164.33	142.5	6.17	13.0%	9.5%

Note: 2022 data is only through September 2022.

The adjustment to Well 1 production data appears to provide a DSL that is more consistent with historical DSL values observed for the Sallal water system. To further assess the reasonableness of applying the Well 1 correction to 2020 and 2021 data, water production, consumption, and distribution system leakage from 2014 through 2021 were reviewed. Figure 1 shows production, consumption, and DSL since 2014.

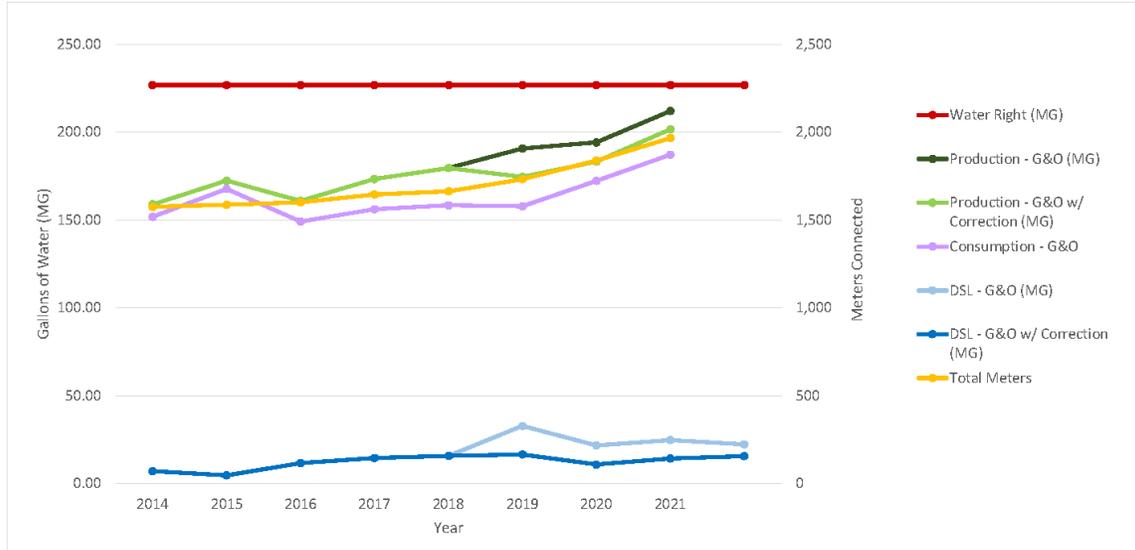


FIGURE 1

Comparison with Well 1 Correction

Figure 1 shows a significant change in the production and DSL in 2019 with the uncorrected Well 1 production data. When the Well 1 production data is corrected, the 2019 DSL better matches historical trends and the production data better matches the consumption data. Based upon the data shown in Table 3 and Figure 1, it appears reasonable to adjust the Well 1 production data back through at least 2019. It may also be reasonable to adjust some of the 2018 Well 1 production data based on when the Well 1 meter was installed.

AVAILABLE WATER CAPACITY

The limiting factor for the Sallal water system is annual water right capacity. Sallal has annual water rights for 696 acres/feet per year (226.8 MG/year). In 2021, Sallal experienced its highest annual usage to-date. The total production (corrected for the Well 1 meter error) was 201.66 MG. Subtracting this from the available annual water right of 226.8 MG per year, leaves 25.15 MG remaining. Assuming an average usage of 198 gpd per ERU, Sallal would have had approximately 348 ERUs of capacity remaining at the end of 2021.



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As of the end of October, water production in 2022 is down about 0.6 percent from 2021 and water consumption is down about 1.0 percent from 2021. Therefore, it appears that 2022 water use will likely be similar to 2021 water use. Comparing the estimated remaining capacity to Sallal's current commitments for water service, it appears that Sallal presently has water rights capacity to serve new and additional connections. We decline to provide an estimate of the number of new and additional connections that Sallal may accept at this time due to potential variability in consumption factors.

CONCLUSIONS AND RECOMMENDATIONS

With the corrections in water production made due to the Well 1 metering inaccuracy, it appears that the Sallal Water Association still has a limited amount of capacity available for new connections. Since water use can vary from year to year, due to changes in weather patterns, consumer behavior, and DSL, we would recommend that Sallal be cautious with the allocation of the remaining water connections. Sallal should carefully review water production and consumption data on a monthly basis to try to identify trends in water consumption patterns or DSL that might merit further investigation or intervention. On an annual basis, Sallal should revisit the available capacity based on water production, consumption, and DSL and should make appropriate adjustments to the available number of ERUs remaining.

MBJ/sr

Encl.