

JORDAN VALLEY WATER CONSERVANCY DISTRICT

**REQUEST FOR STATEMENTS OF QUALIFICATIONS TO PROVIDE
PROFESSIONAL ENGINEERING SERVICES FOR THE**

UTAH LAKE/JORDAN RIVER UTILIZATION STUDY

Project #4372

March 2026

Summary

Jordan Valley Water Conservancy District (JVWCD) invites you to submit a Statement of Qualifications (SOQ) as defined in this request. Proposals shall be submitted in a sealed envelope to JVWCD's Engineering Assistant, Ellisa Demetsky, at 8215 S. 1300 W., West Jordan, UT 84088 or via email to ellisad@jvwcd.gov, no later than 3:00 PM on Wednesday, April 29, 2026 for consideration.

Project Background

JVWCD is a provider of high-quality municipal and industrial (M&I) water to growing areas of Salt Lake County, Utah. Primary sources for JVWCD include Provo Utah River water supplies developed via the Central Utah Project, groundwater imported from Utah County (CWP), and Strawberry Reservoir Water (ULS). These imported supplies are supplemented by local groundwater. Both the Provo River and the local principal aquifer are fully appropriated and unavailable for future M&I development.

Population growth is expected to continue at a rapid pace which will necessitate new water supplies. Additional supplies are required to meet the projected demand before the planned Bear River project comes online (reference Appendix A).

To this end, JVWCD has acquired significant shares of Utah Lake/Jordan River irrigation stock, Utah Lake/Jordan River surface water rights, and appropriated shallow groundwater rights. These supplies have historically been used for agricultural irrigation and will require significant treatment for M&I use, yet the extent of this treatment has not been quantified.

The purpose of this study is to evaluate future use of these Utah Lake/Jordan River supplies for M&I use and determine the most appropriate treatment method(s). The exact methodology and development timing have not yet been determined. In addition to elevated total dissolved solids (TDS), these supplies have elevated nutrient loadings, elevated total organic carbon (TOC), and elevated total suspended solids (TSS) to varying degrees depending upon the diversion point.

Historical utilization of these supplies by “blending” in the early 1990s was unsuccessful due to taste and odor concerns in the finished water and problems within the distribution system. These experiments were quickly abandoned. Due to that unsuccessful experiment, JVVCD knows utilization of any of these three supplies will require extensive treatment prior to use (reference Appendix B and D for baseline Jordan River water quality data).

The known challenges of utilizing Utah Lake/Jordan River include:

1. Reduction in TSS
2. Reduction in TOC and MIB (2-methylisoborneol) (algae taste)
3. Reduction in TDS (typical values 1000 mg/L to 1600 mg/L)

There may be an opportunity to utilize these rights via “riverbank filtration” wells or “shallow groundwater” wells. Utilizing these technologies would likely require less treatment than direct surface water diversion/treatment.

Capacity Objective

Although build-out use of Jordan River supplies might be greater, JVVCD is initially looking to utilize 14-28 MGD (10,000 – 15,000 acre feet per year) of these supplies beginning in approximately year 2040.

Utah Lake/Jordan River Surface Water Availability

Utah Lake/Jordan River surface water supplies primarily originate from Provo River supplies entering Utah Lake as an historical irrigation supply. The irrigation water in Utah lake is augmented by local mountain streams and principal aquifer groundwater “leaks” into Utah Lake as springs (some of which are exceptionally brackish).

The TDS of Utah Lake/Jordan River supplies typically range from 1000-1600 mg/L. TSS and TOC loadings are elevated due to upstream evaporation, contamination from underground salt springs, stormwater runoff, and algae growth. Utah Lake supplies are typically held in Utah Lake for the non-irrigation season and then pumped into the Jordan River for distribution during the irrigation season. The Jordan River only naturally flows year-round during exceptionally wet periods.

Water is distributed via several irrigation canals operated by mutual irrigation companies for the benefit of their shareholders in Salt Lake County. With municipal development, many of the historic farms utilizing this supply have ceased operation making this “brackish” water available for municipal use. This supply includes up to 1,000,000 AF of water with water rights “driving” the entire water utilization system in Utah County and Salt Lake County.

West-Side Deep Groundwater Availability

West-side deep groundwater supplies originate from a “protected” (and sometimes artesian) deep aquifer. The TDS of these supplies varies from 800 mg/L to 1500 mg/L TDS. These levels exceed the Utah Division of Drinking Water primary drinking water maximum contaminant limit (MCL) standard of 500 mg/L so cannot be utilized without blending or treatment. Many JWCD west-side member agencies own these water rights and distribute this water only by “blending” with JWCD supplies to meet the 500 mg/L MCL.

West-Side Shallow Groundwater Availability

West-side shallow groundwater supplies originate from a “perched” shallow aquifer. The sources of these waters include (1) artesian “leaks” from the principal aquifer (2) local stormwater and, (3) Jordan River irrigation canal leakage, and (4) irrigation seepage and return flows. The TDS of these supplies is typically around 1200 mg/L TDS matching the signature of Utah Lake/Jordan River supplies (reference appendix E for water rights).

West-side shallow groundwater supplies are defined by Utah as “waters under the influence of surface water” and require treatment to the primary 500 mg/L TDS standard for distribution.

These supplies are not yet utilized by JWCD, nor its member agencies, due to advanced treatment requirements. JWCD has extensive water right applications for future utilization of this water for M&I use but currently has no infrastructure to utilize this supply.

Existing Surface Water Treatment

JWCD currently operates two surface water treatment plants:

1. Jordan Valley Water Treatment Plant (JVVTP) 180 mgd (currently expanding to 255 mgd)
2. Southeast Regional Water Treatment Plant (SERWTP)(20 mgd)

These plans utilize conventional treatment for high-quality river water. The SWGWTP utilizes ballasted flocculation. The JVVTP utilizes plate settlers.

Existing Advanced Treatment

JWCD operates one 7 MGD advanced treatment reverse osmosis (RO) plant (Southwest Groundwater Treatment Plant-SWGWTP). Brine is discharged to the Great Salt Lake under applicable discharge permits. The source water for this plant is brackish deep aquifer groundwater with high-sulfate loadings resulting from 100 years of local mining operations. JWCD has been successfully treating these waters for distribution for about 10 years.

Note: The SWGWTP was designed to treat either deep groundwater, or shallow groundwater under the influence of surface water, yet to-date only deep groundwater has been treated.

RO treatment of Jordan River supplies would likely be successful but would necessitate construction of 30 miles of parallel brine line to the Great Salt Lake at substantial cost. Before constructing this additional brine line, JWCD would like to explore water supply/treatment options which would not require expansion of this brine line.

Objectives of this Study

JWCD is interested in professional engineering assistance to:

1. Determine ways to economically utilize Utah Lake/Jordan River supplies to supplement JWCD's existing M&I supplies.
2. Develop a "road-map" for future utilization of these supplies.

Any treated Jordan River/Utah Lake water must be compatible with the District's existing finished water supplies (i.e. TDS < 300 mg/l with low taste and odor) and meet all applicable federal and state water quality standards.

Options Considered:

As mentioned, Direct utilization of Jordan River water in the 1990s via dilution was less than favorable. At the time studies suggested that lime softening might effectively remove some MIB and TDS, but these alternatives have never been fully explored.

The following options have been considered by JWCD in the past:

1. Direct surface treatment of Jordan River supplies either from the river or from existing irrigation canals fed by the Jordan River.
2. Pre-treatment of shallow groundwater supplies prior to finishing treatment at the JWTP.
3. Direct treatment of shallow or deep groundwater supplies for distribution at either a centralized or distributed water treatment plant(s).
4. More extensive use of member agency and general public water rights in the west-side deep aquifer by mutually beneficial cooperation.

The following technologies have been considered:

1. Conventional treatment with granular activated carbon/ozone finishing
2. Lime softening to remove hardness/TOC followed by conventional treatment.
3. Membrane treatment with either ultrafiltration/nanofiltration/reverse osmosis.
4. Indirect pre-treatment via shallow well extraction.
5. Indirect pre-treatment via riverbank filtration well extraction.
6. Indirect pre-treatment via shallow well extraction.
7. Indirect pre-treatment utilizing centralized Rainey style horizontal collector wells in areas of high shallow groundwater.
8. Surface water spreading of Welby Canal water to Bingham Creek and Barney's Wash (artificial recharge of principal aquifer).

9. Some combination of these technologies.

This study is being completed to further evaluate lime treatment of Jordan River supplies for future use. There is also the opportunity for direct wastewater reuse, but reuse is not the primary focus of this project.

Proposed Engineering Scope:

1. Complete a survey of successful extraction/treatment methods for similar brackish, high TOC water supplies.
2. Supervise 3rd-party water quality testing to establish baseline water quality at the following potential locations:
 - 2.1 Jordan River at 16000 South (potential Jordan River diversion point) (reference Appendix C for Utah stream use designations)
 - 2.2 Welby Canal at 15305 S. 3200 West (potential canal water diversion point)
 - 2.3 Utah and Salt Lake Canal near 4500 S. 4800 West
 - 2.4 SWGWTP Shallow Well # 1 at 8215 S. 1300 West (existing shallow well near the Jordan River)
 - 2.5 SWGWTP Deep Well # 8 at 8215 S. 1300 West (existing northern deep aquifer well near the Jordan River)
 - 2.6 Brackish Well at 1516 West 14600 South Well (existing southern deep well near the Jordan River)

Note: Testing costs will be paid by the owner via a separate contract.

3. Evaluate potential treatment methods not requiring expansion of the SWGWTP brine line (i.e., lime softening, suspended ion exchange, zero discharge RO, etc.)
4. Evaluate potential treatment methods with expansion of the SWGWTP brine line (nanofiltration, reverse osmosis).
5. Compare potential shallow groundwater extraction methods (vertical wells, oblique riverbank filtration wells, horizontal collector (Rainey) wells, etc.
6. Complete limited Jar Testing to evaluate potential treatment methods for surface water supplies or groundwater supplies.
7. Report preparation with recommendations (including indexable potential costs.)

Primary Questions To Answer

The following are questions which will be evaluated for the Utah Lake/Jordan River supplies as part of this study:

1. Is it possible/feasible to provide acceptable levels of TOC/TDS removal without a brine line? (Goal TDS < 300 mg/L).
2. Is it possible/feasible to provide sufficient hardness/TDS reduction utilizing lime softening or alternate softening technology?
3. What levels of chloride will remain in the treated effluent which might affect taste and odor or lead to excessive corrosivity?
4. What advantages would nano filtration/reverse osmosis treatment provide which would justify the expected cost of an expanded/parallel brine line?

Deliverables

Technical memos summarizing opportunities available to JWCD, treatment methodologies and effectiveness, and a final report quantifying the most promising extraction and treatment alternatives for future consideration by JWCD. This report will be used as a “road-map” in the District’s future planning/budgeting needs.

Siting Possibilities

Although siting a future treatment facility(s) is largely beyond the scope of this study, JWCD currently owns four large parcels which might be utilized:

1. Lands west of JWTP – 15305 South 3200 West
2. Tank Farm – 4408 S. 4800 West along byproduct pipeline
3. Land south of the existing SWGWTP – 8215 S. 1000 West
4. JWCD North Office Complex – 1580 West 3860 South

Engineering Firm Selection Method

JWCD utilizes qualification-based selection. The selected firm will have extensive nationwide experience successfully completing similar studies and treating similar water supplies.

Minimum Qualifications

The project manager for the project shall have a minimum of five treatment projects of varying complexity including a minimum of two advanced treatment projects.

The senior supervising engineer for the project shall have a minimum of ten treatment projects of varying complexity including a minimum of four advanced treatment projects.

Estimated Schedule

- Award of Consulting Contract: June 2026
- Contract Preparation: 30 days
- Kick off meeting: July 2026
- 50% workshop: 240 days
- 80% workshop: 120 Days
- Draft Technical Memo: 90 Days
- Final Technical Memo: 60 Days

Estimated Engineering Fees

JVWCD estimates engineering fees between \$200,000 and \$250,000 to achieve its desired objectives (although the exact budget will be negotiated based upon an approved work plan). The qualifying firm is responsible for responding to this SOQ with a draft custom work plan meeting the minimum objectives of this study, including additional services needed as determined based upon their firm experience.

Statement of Qualification Evaluation

SOQs, including the draft work plan, shall not exceed ten (10) pages in length. Resumes, sample drawings, and references may be included in an appendix not counted in the maximum SOQ length.

The SOQ should include the following information:

- Qualifications: Identify key experience of the firm and proposed team which would indicate specific qualifications to complete the work desired.
- Work Plan: Include a proposed work plan which addresses the scope of the work and identifies key issues. A final agreed upon work plan will be negotiated.

Include with the work plan a table showing the number of hours planned for each position for each major work task. **Do not include any billing rate or cost information in this work plan table.**

Past Performance: Provide information about past completed projects which the proposing firm determines would be relevant.

Incomplete projects (on-going work) may be submitted for consideration, but each ongoing project presented should be clearly indicated

Selection Method

Selection of a consultant will be completed in accordance with the State of Utah's Procurement Code for Design Professional Services (Utah Code Title 63G, Chapter 6a, Part 15).

Evaluation Criteria

An evaluation committee appointed by JWCD's Chief Engineer including representatives from JWCD will convene to consider all responsive SOQs submitted and to rank the SOQs based on each criterion stated in this section. Evaluation criteria are assigned a maximum number of points for evaluation purposes with a cumulative total of 100 points. Each SOQ will be evaluated based on the evaluation criteria in the following table:

<u>Evaluation Criteria</u>	<u>Grade</u>	<u>Weight</u>	<u>Maximum Points</u>
1. Demonstrated Qualifications to meet the scope of work:			
a. Firm resources that satisfy the defined minimum qualifications. Demonstrated availability of firm resources to the project team.	0-5	3	15
b. Project manager and key team members with the education, expertise, and experience necessary as required for the project	0-5	5	25
2. Responsiveness of draft Work Plan:			
a. Clearly written work plan responding to the requirements of this RFP which indicates an understanding of the key issues and deliverables required for this project. Higher scores may be given to proposals which show familiarity with District facilities related to this project, or which note suggested revisions to the scope of work which would lead to an enhanced outcome.	0-5	5	25
b. Project schedule which identifies completion dates for key milestones and a final completion date.	0-5	1	5
3. Past Performance:			
a. Positive verified past references for the Proposing Firm indicating successful past performance on similar projects, including projects for JWCD.	0-5	3	15
b. Positive verified past references for the Project Manager and other key team members indicating successful past performance on similar projects, including projects for JWCD.	0-5	3	15
TOTAL			100

Each criteria will be graded on a scale of 0-5 with 5 being the highest grade. The grades will be multiplied by the appropriate weighing factor to determine the total score.

SOQs shall have a level of effort appropriately matching the requirements, including efforts by key positions. SOQs falling short of an appropriate overall level of effort and/or effort by key positions may be considered non-responsive. JVVCD reserves the right to reject all SOQs.

Fee Proposal Instructions

A fee proposal will be requested from the firm receiving the highest score. The fee proposal will be due a maximum of ten (10) days after it is requested by JVVCD. If JVVCD's procurement officer is unable to agree to a satisfactory contract with the highest scoring design professional, at a price the procurement officer determines to be fair and reasonable to the procurement unit, the procurement officer shall formally terminate discussions with that design professional, and undertake discussions with the second highest scoring qualified design professional. For additional information, see Utah Code Title 63G, Chapter 6a, Part 15, Section 1505.

The fee proposal shall be provided in a spreadsheet format typical for professional engineering proposals. If the required information is not present, the fee proposal may be considered non-responsive. The hourly billing rate for each position, number of hours per task by position, and any fees for reimbursable expenses and overhead factors shall be clearly indicated. Proposed hourly billing rate increases, if applicable for multi-year projects, should likewise be clearly indicated. The total proposed fee for the study will be considered a maximum not-to-exceed fee amount.

Upon execution of the Agreement by both parties, the Engineer will receive authorization to proceed with only those services identified in the Agreement. The Engineer must receive prior written authorization before performing any services outside the scope and fee amount identified in the Agreement.

Confidentiality

All information, documents, records and paperwork, including but not limited to SOQs, bids, exhibits, or brochures (collectively, the "Paperwork") submitted to the District shall not be regarded by the District as secret or submitted in confidence, except as otherwise provided in a writing signed by the District. Please do not mark your Paperwork with legends such as "confidential," or "proprietary," or "not to be disclosed to third parties." The District is a Utah local district and is subject to the provisions of the Utah Government Records and Management Act ("GRAMA," Utah Code Ann. (1953) §§63-2-101 et seq.) Paperwork submitted to the District may be subject to disclosure to third parties under the District's interpretation of the provisions of GRAMA.

Questions or Suggestions

Proposers may ask questions or make suggestions to JWCD on any element of this Request for SOQs. Questions or suggestions should be submitted to JWCD's Technical Program Leader, David McLean, PE, at 801-680-6334 or via email addressed to dmclean@jvwcd.gov.

APPENDICES

Appendix A Chart Summarizing the District's Current and Future Water Sources

Appendix B Jordan River Water Quality Summary

Appendix C Utah Department of Environmental Quality Stream Designations

Appendix D Selections from 1993 Carollo Study

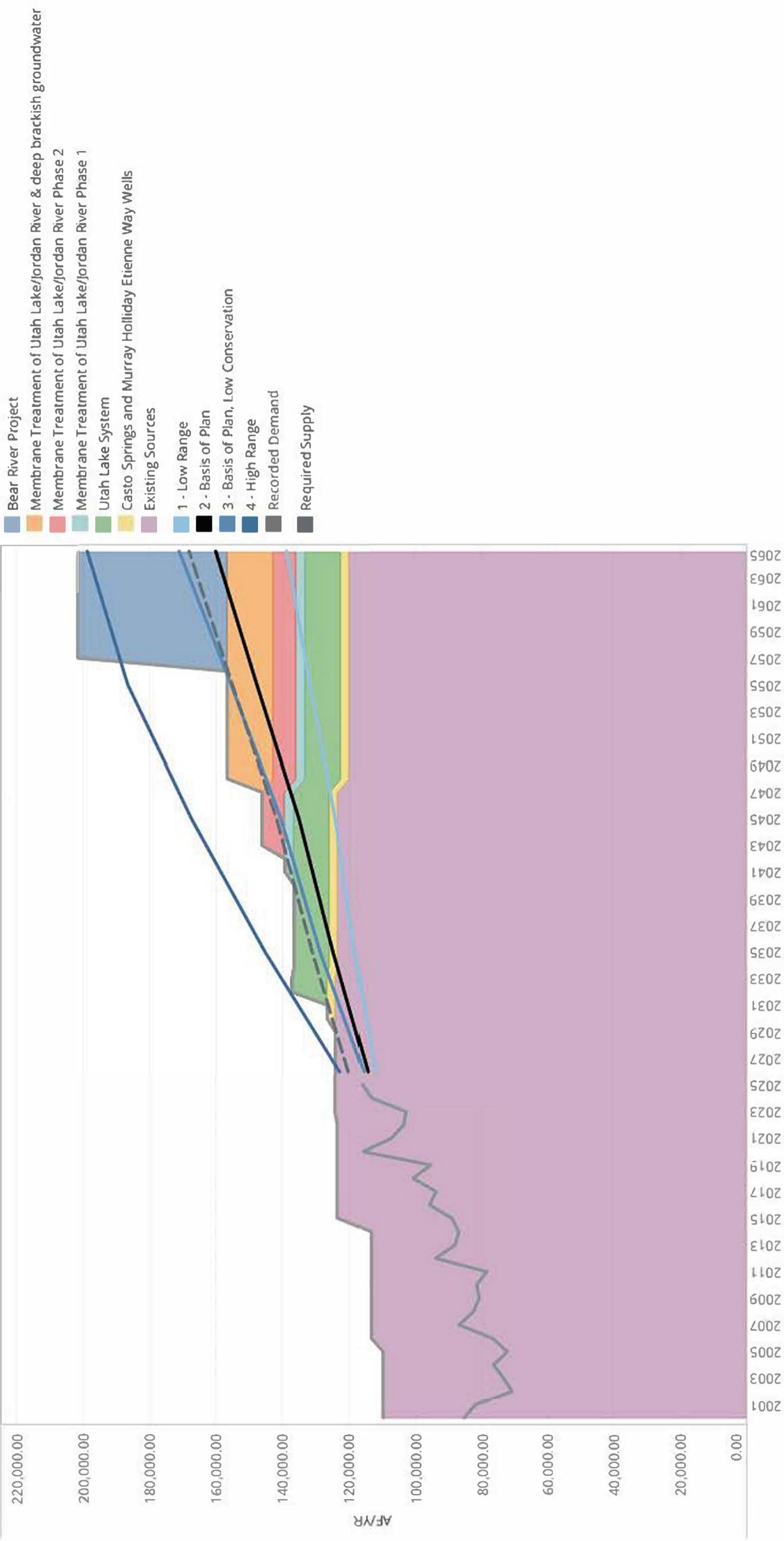
Appendix E Shallow Well Points of Diversion

Appendix F Selected Photos of Jordan River

Appendix A Chart Summarizing the District's Current and Future Water Sources

Supply and Demand Forecast

Average Daily Demand (*Dry Year)

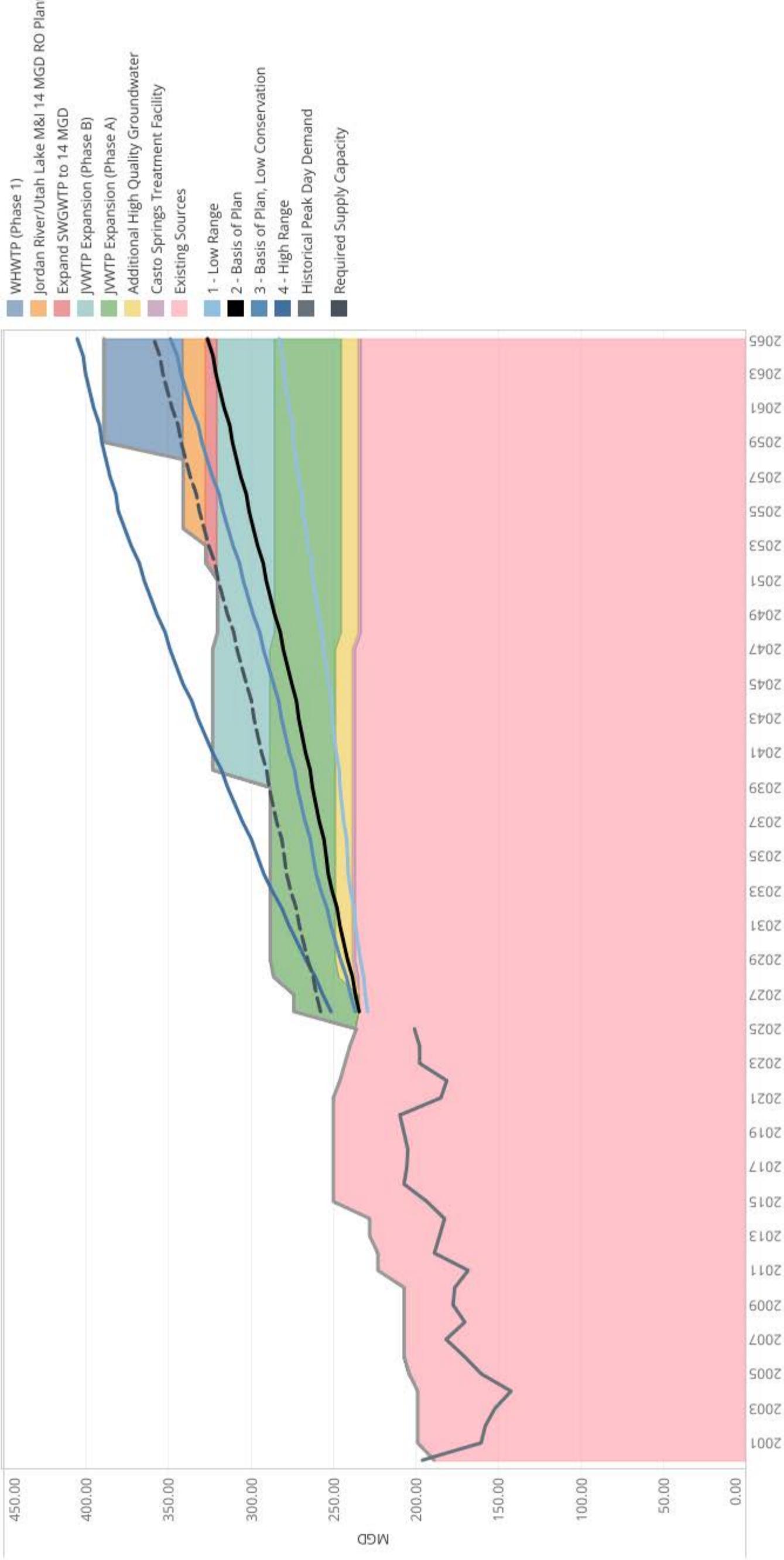




Supply and Demand Forecast

Maximum Daily Demand

(Drought Year - *NO climate impacts, 2020 multiplier starts at 2.291)



Appendix B Jordan River Water Quality Summary

JORDAN RIVER WATER QUALITY SUMMARY

		JNPS Well	SW1	SW1	DW8	Jordan River	Jordan River	Jordan River
		9/30/2005	5/8/2013	3/1/2012	2/2/2012	10TH Percentile	Average	90TH Percentile
Hardness	mg/L		523	560	386	321	390	469
Alkalinity (total)	mg/L		279	252	138	204	229	253
Chloride	mg/L		242	240	210			
pH	units		7.6	7.5	7.7	7.2	7.9	8.5
Sulfate	mg/L	70	260	260	128			
TDS	mg/L	634	1030	1030	662	689	926	1164
TSS	mg/L		0	0	12			
Manganese	ug/L		0	0	8			
TOC						1.9	5.6	11.6
Temperature	°C					7.35	16.6	23.2
Turbidity	NTU					36	89	146

Appendix C Utah Department of Environmental Quality Stream Designations

Utah R317-2-6

R317-2-6. Use Designations.

The Board as required by Section 19-5-110, shall group the waters of the state into classes so as to protect against controllable pollution the beneficial uses designated within each class as set forth below. Surface waters of the state are hereby classified as shown in R317-2-13.

6.1 Class 1 -- Protected for use as a raw water source for domestic water systems.

a. Class 1A -- Reserved.

b. Class 1B -- Reserved.

c. Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah

Division of Drinking Water

6.2 Class 2 -- Protected for recreational use and aesthetics.

a. Class 2A -- Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.

b. Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

6.3 Class 3 -- Protected for use by aquatic wildlife.

a. Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.

b. Class 3B -- Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

c. Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.

d. Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

e. Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

6.4 Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

6.5 Class 5 -- The Great Salt Lake.

a. Class 5A Gilbert Bay

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation south of the Union Pacific Causeway, excluding all of the Farmington Bay south of the Antelope Island Causeway and salt evaporation ponds.

Beneficial Uses -- Protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

b. Class 5B Gunnison Bay

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation north of the Union Pacific Causeway and west of the Promontory Mountains, excluding salt evaporation ponds.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

c. Class 5C Bear River Bay

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation north of the Union Pacific Causeway and east of the Promontory Mountains, excluding salt evaporation ponds.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

d. Class 5D Farmington Bay

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation east of Antelope Island and south of the Antelope Island Causeway, excluding salt evaporation ponds.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

e. Class 5E Transitional Waters along the Shoreline of the Great Salt Lake Geographical Boundary -- All waters below approximately 4,208-foot elevation to the current lake elevation of the open water of the Great Salt Lake receiving their source water from naturally occurring springs and streams, impounded wetlands, or facilities requiring a UPDES permit. The geographical areas of these transitional waters change corresponding to the fluctuation of open water elevation.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

13.5 Utah Lake-Jordan River Basin
a. Jordan River Drainage

TABLE

Jordan River, from Farmington Bay to North Temple Street, Salt Lake City	2B	3B*	3D	4
State Canal, from Farmington Bay to confluence with the Jordan River	2B	3B*	3D	4
Jordan River, from North Temple Street in Salt Lake City to confluence with Little Cottonwood Creek	2B	3B*		4
Surplus Canal from Great Salt Lake to the diversion from the Jordan River	2B	3B*	3D	4
Jordan River from confluence with Little Cottonwood Creek to Narrows Diversion	2B	3B		4
Jordan River, from Narrows Diversion to Utah Lake	1C	2B	3B	4
City Creek, from Memory Park in Salt Lake City to City Creek Water Treatment Plant		2B	3A	
City Creek, from City Creek Water Treatment Plant to headwaters	1C	2B	3A	
Red Butte Creek and tributaries, from Liberty Park pond inlet to Red Butte Reservoir		2B	3A	4
Red Butte Creek and tributaries, from Red Butte Reservoir to headwaters	1C	2B	3A	
Emigration Creek and tributaries, from 1100 East in Salt Lake City to headwaters		2B	3A	4
Parleys Creek and tributaries, from 1300 East in Salt Lake City to Mountain Dell Reservoir	1C	2B	3A	
Parleys Creek and tributaries, from Mountain Dell Reservoir to headwaters	1C	2B	3A	
Mill Creek (Salt Lake County) from confluence with Jordan River to Interstate 15	2B		3C*	4

Appendix D Selections from 1993 Carollo Study

During the seasons of low turbidity, UV absorbance averaged 0.05. As turbidity of the raw water increased, the average UV absorbance increased to 0.14; correspondingly there were more frequent spikes. An average UV absorbance at 254 nm was reported as 0.1.

Total Trihalomethane Formation Potential. The 7-day, Total Trihalomethane Formation Potential was measured in raw water during the pilot study in summer of 1990. Based on limited number of analyses that would not experience sampling or holding time problems, it can be estimated that the raw water has a potential of forming about 100 micrograms per liter (ug/L) of THMs. No seasonal variations were measured in THMFPs for raw water.

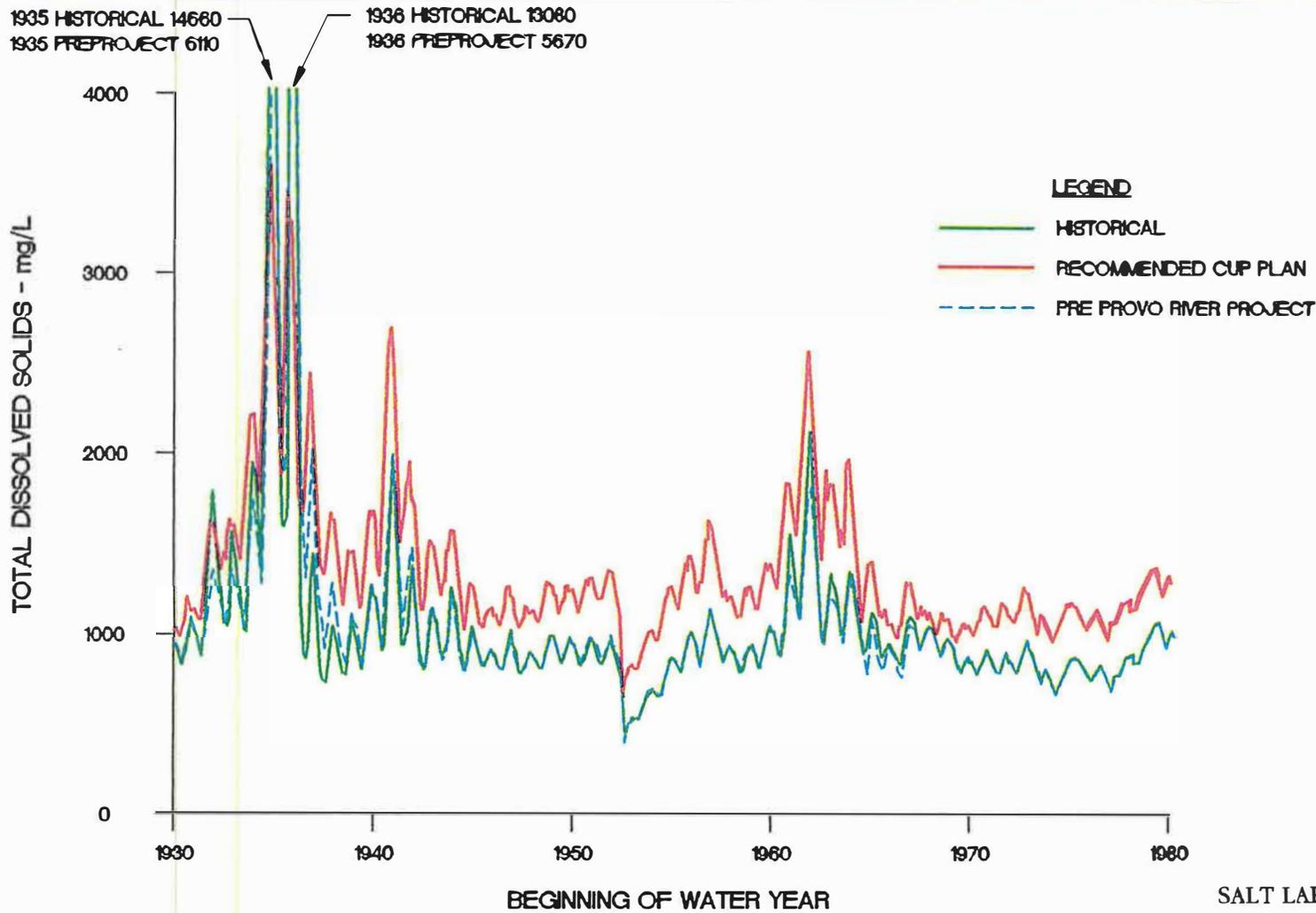
For the purpose of developing more water from Utah Lake, the quality of the water can be considered good with the exception of TDS. Therefore, the bulk of the remaining analysis and discussion concerns the amount of TDS in the water and how to arrive at an acceptable level.

Generally it can be said that all of the SLCWCD water sources, except that supplied from Utah Lake, are "low" in TDS. This term is used for those waters whose TDS level is at or around the 250 mg/L level on a consistent basis. Levels of TDS in the "low TDS" category fluctuate through the year, but fluctuation is minimal (plus or minus 20 mg/L).

The "low TDS" category and the minimum fluctuation of TDS does not hold true for Utah Lake and the resulting outflow into the Jordan River. Because of the many streams, surface runoff, agricultural underdrain, and mineral springs in or around the lake and the Jordan River, the levels of TDS are much higher and fluctuate significantly through the year. Another significant factor impacting the level of TDS in Utah Lake is the high evaporation rate due to the large surface area. Flows to the lake vary from year to year due to differing amounts of precipitation and spring runoff, but the evaporation rate plays a more dramatic role on the stage level and the TDS level of the lake. Reclaimed water discharging to the lake from the various communities and industrial sites around the lake have the potential of becoming contributors to a change in the future water quality of Utah Lake. However, as reported in the 1981 "Utah Lake Sanitary Survey" by Dr. Merritt, et al, these sources in the past have had a minor impact on the Lake's water quality and is believed that none of these factors would noticeably change the water quality of the lake from its present condition.

Annual averages of TDS in Utah Lake may fluctuate from a low of 570 mg/L (1953) to a high of 4,610 mg/L (1935) while the monthly averages range from a low of 417 mg/L in May, 1952 to a high of 14,510 mg/L in September, 1935. Results are as reported by Merritt, et al, in the 1982 WHAB Phase I Report. Figure 3.1 taken from the Merritt, et al, report, shows the simulated historical levels of TDS for the 50 year period from 1930 to 1980. This figure indicates the wide variation in levels of TDS in Utah Lake. As part of the WHAB report, this fifty year record was projected ahead for the period 1990 to 2039. Figure 3.1 also shows simulated TDS levels for the pre-Provo River Project and for the projected CUP project.

The SLCWCD developed monthly Exceedence Probability curves of TDS concentration for the months June through November, based on the past 15 years of historic data (1976 to 1990). In 1990, the SLCWCD then requested Dr. Merritt to rerun the model of Utah Lake levels of TDS for the purpose of this study. This adjusted the Exceedence Probability curves upwards. The



NOTE: SIMULATED HISTORICAL CONDITIONS

SALT LAKE COUNTY
WATER CONSERVANCY DISTRICT
MASTER PLAN

**TOTAL DISSOLVED SOLIDS
CONCENTRATIONS IN UTAH LAKE**

FIGURE 3.1

reason for this adjustment was that the model now incorporated a more definite representation of developments around the lake and it also had another 10 years of operational data (1980 to 1990) which was used to adjust a few inputs to the simulation model. These curves were then adjusted upward based on the new annual average levels of TDS that resulted from the latest model. The annual average of TDS, based on the 1990 adjustment, was 1,132 mg/L. The Exceedence Probability curves, representing this new adjustment is included in Chapter 5 (Figure 5.1) where it is used in the development of blending ratios for the treatment quantity calculations.

3.4 FINISHED WATER

The finished water quantity discussed herein is the total amount of water that the SLCWCD delivered to retail and wholesale customers since 1952. The finished water quality is the quality of that water as it is delivered to the customers. The following evaluation of quantity and quality was performed on a yearly basis to coincide with annual distribution and billing cycles and supply contracts, exchange agreements and the water year.

Quantity

The quantity of water distributed by the SLCWCD to its customers each year exactly meets the demand for that year. The actual amount depended on the year itself and whether it was a "drought", "average", or "wet" year. Figure 3.2 is the SLCWCD's plotted historical curve of water supplied since 1952. The curve shows the growth rate over the past 40 years up to a current average annual demand of 70,000 ac-ft/yr.

The amount of water distributed fluctuated throughout the year meeting peak demands during the day, peak demand periods during each month and peak demand months during the year. To help understand the distribution of water through the year, a 10 year average, for the period 1980 to 1989, of the monthly distribution was calculated as a percentage of the total water distributed for that year. Figure 3.3 depicts this average monthly demand over the 10 year average. It is interesting to note the three peak months (June, July and August) represent almost half (49 percent) of the total volume supplied. The design criteria, therefore, for treatment and conveyance capabilities of the system will be based on the flows within these months.

Quality

Treated water quality for both the SERWTP and the JWTP are presented on Table 3.7. This table also includes Environmental Protection Agency (EPA) primary Maximum Contaminant Levels (MCL), EPA Secondary MCL's, EPA proposed MCL's, EPA Maximum Contaminant Level Goals (MCLG), EPA proposed MCLG's, and American Water Works Association (AWWA) goals. The values reported in Table 3.7 for the EPA levels and goals, as well as the AWWA's goals, are as of July, 1991. In comparing the finished water quality of the treatment plants to the above mentioned criteria, it appears that the SLCWCD's waters are well within acceptable limits.

Appendix E Shallow Well Points of Diversion

59-5786

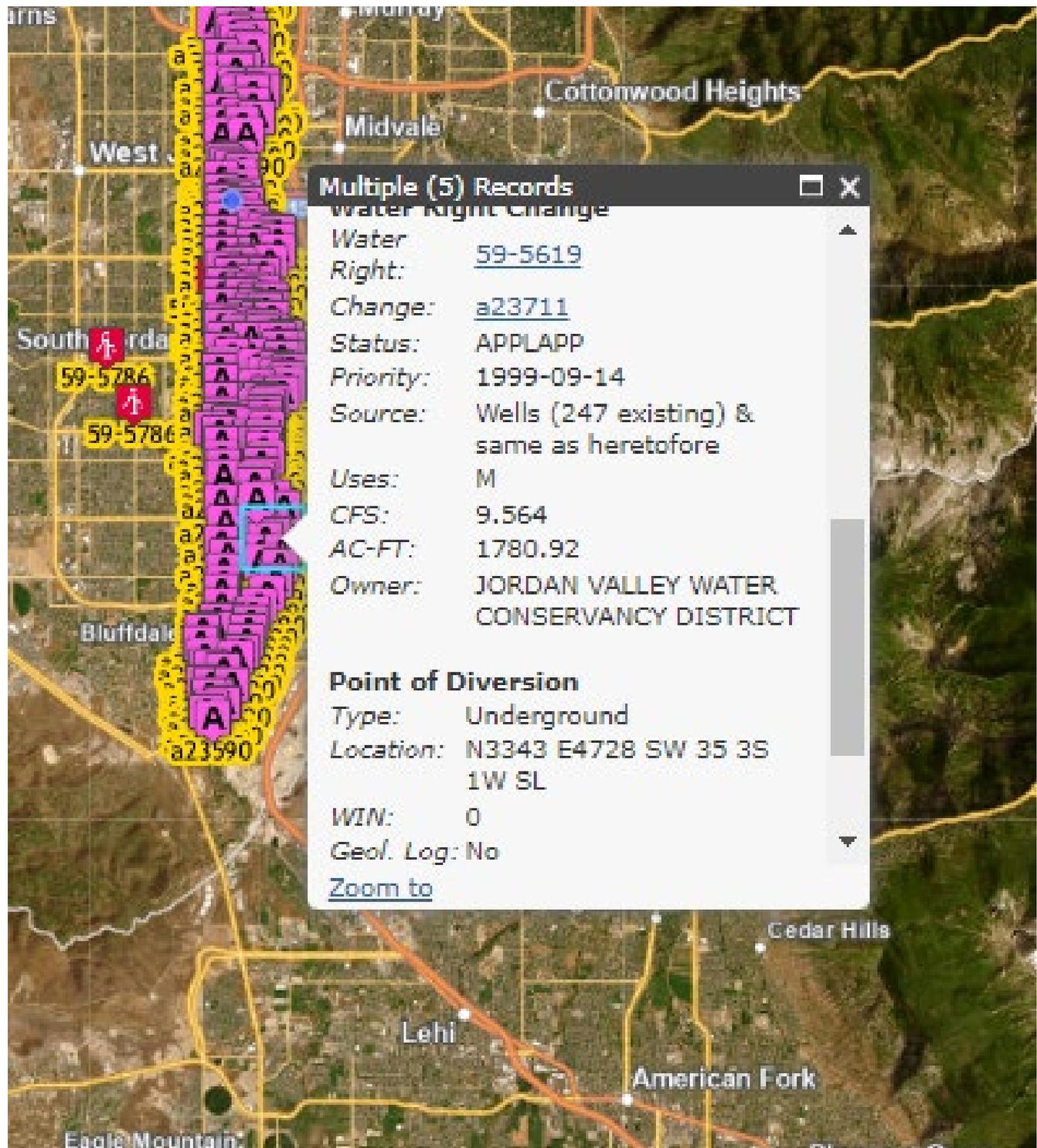
Water Right 59-5786

Status: Approved
Priority: 1964-07-30
Source: Underground Water Well
Uses: M
CFS: 2.5
AC-FT: 800.0
Owners: Jordan Valley Water
Conservancy District

Point of Diversion

Type: Underground
Location: N4775 E105 SW 16 3S 1W SL
WIN: 431293 ([Well Log](#))
Geol. Log: No

[Zoom to](#)



Multiple (5) Records ☐ ✕
water right change

Water ▲
Right: [59-5619](#)

Change: [a23711](#)

Status: APPLAPP

Priority: 1999-09-14

Source: Wells (247 existing) & same as heretofore

Uses: M

CFS: 9.564

AC-FT: 1780.92

Owner: JORDAN VALLEY WATER CONSERVANCY DISTRICT

Point of Diversion

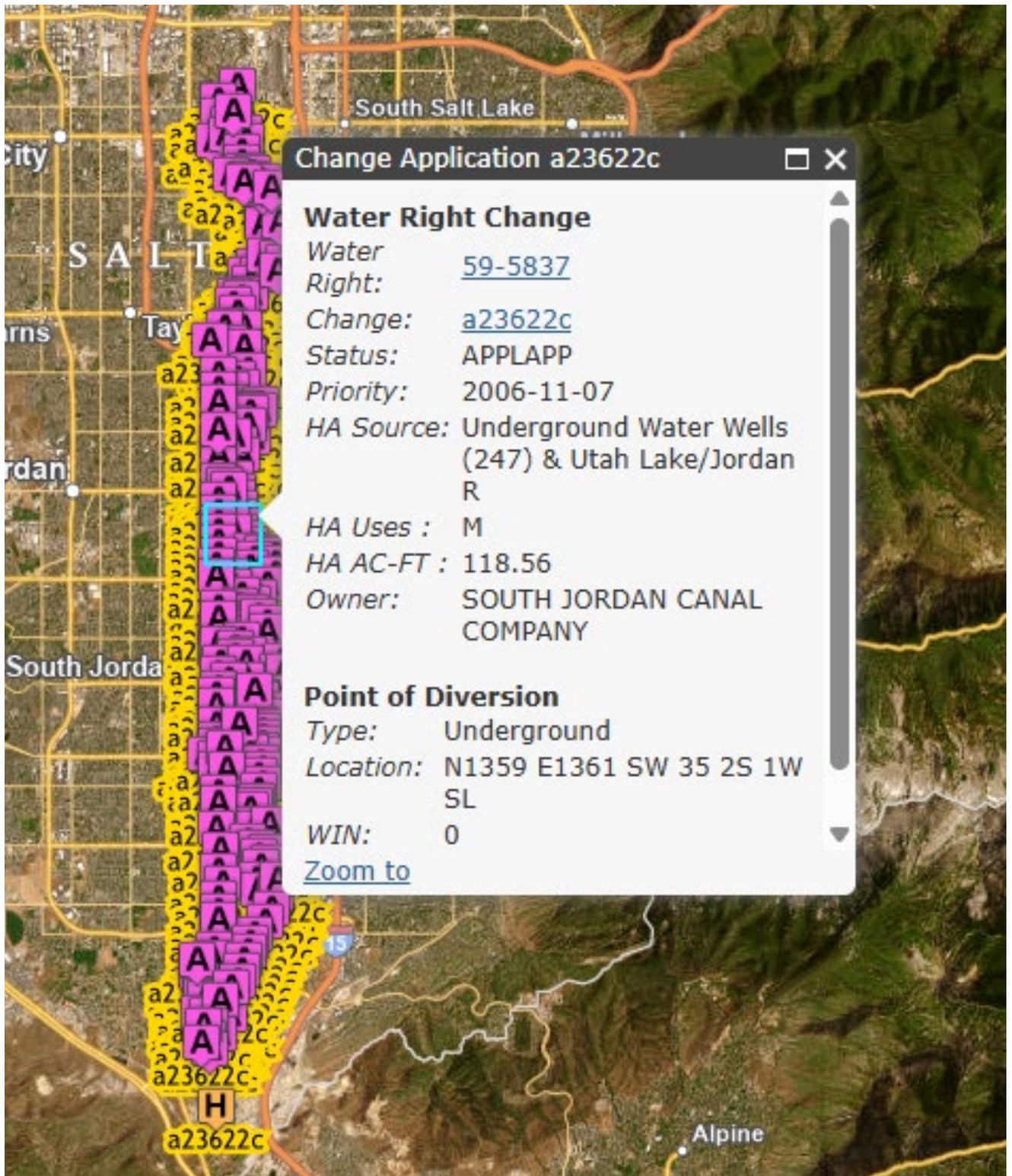
Type: Underground

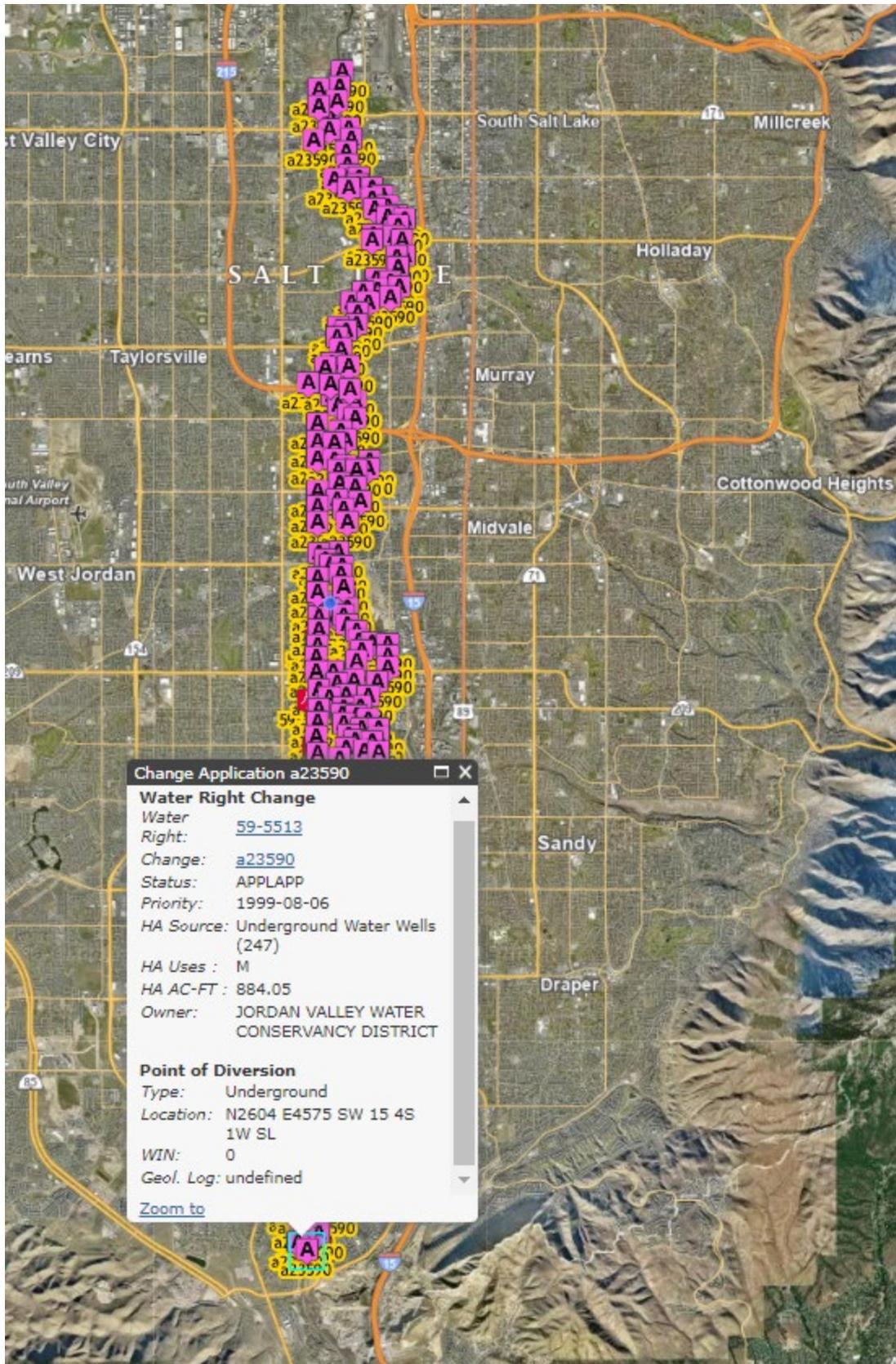
Location: N3343 E4728 SW 35 3S
1W SL

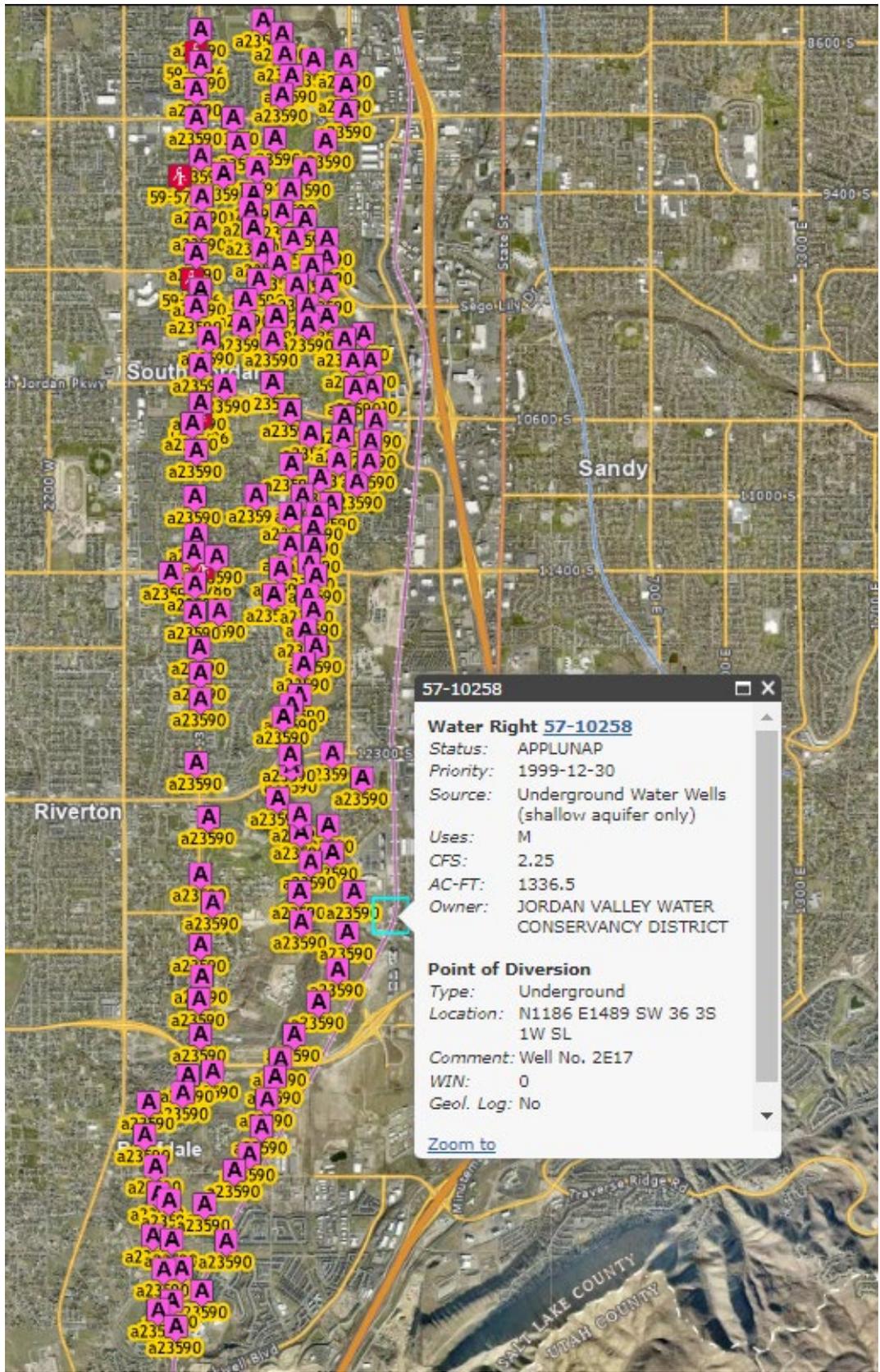
WIN: 0

Geol. Log: No

[Zoom to](#)







57-10258 [Close] [Refresh]

Water Right 57-10258

Status: APPLUNAP
 Priority: 1999-12-30
 Source: Underground Water Wells (shallow aquifer only)
 Uses: M
 CFS: 2.25
 AC-FT: 1336.5
 Owner: JORDAN VALLEY WATER CONSERVANCY DISTRICT

Point of Diversion

Type: Underground
 Location: N1186 E1489 SW 36 3S 1W SL
 Comment: Well No. 2E17
 WIN: 0
 Geol. Log: No

[Zoom to](#)

Appendix F Selected Photos of Jordan River



View of Welby Canal Pump Station (operated by JWCD), Suction from the Jordan River at 16000 South)



View the Jordan River from the Welby Canal Pump Station at 16000 south



View 1 of Welby Canal (supplied by Jordan River) near Jordan Valley Water Treatment Plant
15305 South 3200 West



View 2 of Welby Canal (supplied by Jordan River) near Jordan Valley Water Treatment Plant 15305 South 3200 West