



EXECUTIVE OFFICER'S REPORT • September 2020
Covers July 16, 2020 – August 15, 2020

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1. Personnel Report – *Eric Shay*

New Hires – None

Vacancies:

- Senior Environmental Scientist (Specialist), Compliance & Planning Division, South Lake Tahoe. This position serves as the Regional Monitoring Coordinator; lead for coordinating implementation of the Region's Climate Change Adaptation and Mitigation Strategy; and regional specialist for monitoring related special studies, investigations, and projects. The position will provide the lead responsibility for making policy recommendations, providing technical expertise orally and in written documents, evaluating and drafting environmental documents, and performing analysis on technically complex and politically sensitive assignments related to water quality monitoring and Water Board response to climate change in the Lahontan Region.
- Engineering Geologist, Department of Defense / Site Cleanup Program Unit, Victorville. This position analyzes threat of pollutants to groundwater and surface waters, reviews technical reports for cleanup strategies, reviews site investigation results, reviews proposed cleanup alternatives to ensure compliance with water quality objectives, prepares enforcement orders, investigates spills, and conducts inspections of cleanup sites and facilities.
- Water Resource Control Engineer, Wastewater & Agricultural Operations Unit, Victorville. This position provides regulatory oversight of projects involving discharges to ground or surface waters and projects intended to restore and/or enhance water quality.
- Scientific Aid, Cleanup/Site Investigation & Enforcement Unit, South Lake Tahoe. This position assists staff with administering the site cleanup, underground storage tank, land disposal, and enforcement programs; reviewing reports, and maintaining databases; reviews self-monitoring reports for cases, permits and enforcement actions; reviews project files and water quality data to prepare for field inspections and permit updates; assists with field inspections; and reviews California Environmental Quality Act documents.
- Environmental Scientist, Non-Point Source Unit, South Lake Tahoe. This position provides scientific and regulatory agency review and comment focusing on compliance with California Environmental Quality Act (CEQA) requirements of projects for potential impacts to water resources from non-point sources of pollution, especially those associated with grazing and agricultural activities. Position drafts waste discharge requirements or waivers; conducts project reviews; and performs inspections of project areas to ensure activities do not result in increased sediment, nutrient, and/or pathogen loading to surface waters.
- Scientific Aid, Planning & Assessment Unit, South Lake Tahoe. This position helps the SWAMP program collect and process water quality samples and ensure data quality. The position supports the TMDL and Basin Planning programs through mapping and data analysis, outreach, and reporting.
- Scientific Aid, Wastewater & Agricultural Operations Unit, Victorville. This position supports the unit in evaluating submitted self-monitoring reports for compliance with

waste discharge requirements. Other duties include supporting staff in conducting project-specific data analysis.

Departures – None

North Lahontan Region

2. PFAS Transport, Fate, and Remediation in Groundwater – Kerri O’Keefe

On June 24 and 25, 2020, Water Board staff attended a Per- and Polyfluoroalkyl Substances (PFAS) Transport, Fate and Remediation in Soil and Groundwater training course through the Water Board’s Training Academy and UC Davis Extension. The course explained what PFAS compounds are, the complexity of the compounds, how PFAS moves through the environment, and techniques that can be used to remediate PFAS-affected soil and groundwater. The PFAS compounds are emerging contaminants of concern that include more than 3,000 manmade chemicals used in thousands of processes and products since the 1940s. PFAS compounds became popular because they repel oil and water, are resistant to high temperatures, and reduce friction. The compounds have entered the environment through firefighting activities, landfilling, biosolids applications, refining, metal plating, municipal sewer systems, and manufacturing of products including textiles/carpets, cosmetics, sunscreen, bug spray, electronics, waterproof clothing, and paper products.

Soil and groundwater contamination from PFAS compounds are present world-wide. One issue with PFAS compounds is that there are thousands of PFAS precursors, hundreds of intermediate transformation products, and the compounds occur in various ionic states. Each fluorinated compound has very different physical and chemical properties; and therefore, behaves differently in soil and groundwater.

Potential health effects of PFAS in humans include possible changes in growth and learning behavior, decreased fertility, liver effects including increased production of cholesterol, and immune effects including decreased vaccination response and asthma, and cancers of the kidney, reproductive organs, and prostate. PFAS occur widely in plants, invertebrates, fish, and humans through bioaccumulation processes. PFAS typically bio-transforms into other fluorinated compounds and bioaccumulate in the environment, but do not biodegrade. Attenuation is primarily based on biotransformation, diffusion, and sorption.

PFAS remediation technologies now in use include sorption with activated carbon, ion exchange, membrane filtration including reverse osmosis and nanofiltration, foam and ozone fractionation. Bioremediation and chemical oxidation/reduction technologies are available but are less utilized. A pilot study began in June 2020 to evaluate remedial technologies using electrochemical oxidation, plasma treatment, and sonochemical synthesis, but these technologies are expensive and/or not readily available.

Currently, the only practical treatment for PFAS-contaminated groundwater is pump and treat with activated carbon and ion exchange. Powdered or granular activated carbon can remove the PFAS molecules from water; however, regeneration, disposal, and replacement of exhausted sorbents must be considered because adsorption is a non-destructive process. No chemical degradation or transformation occurs, and risks associated with disposal of the exhausted sorbents must be considered. Ion exchange has key advantages over granular activated carbon including faster reaction rates, higher operating capacity, and less media replacement. A case study of PFAS contamination at Pease Air Force Base in New Hampshire indicates ion exchange requires less treatment

vessels, less overall contact time, can sustain a higher pump rate, treats a larger volume of water, and exchange resin can be regenerated in the field.

Completion of the PFAS training course is expected to help Water Board staff be more effective with work such as evaluating work plans for PFAS investigation and remediation, interpreting PFAS analytical data, and evaluating the fate and transport of the compounds.



Image 2.1: Fire-fighting activities (i.e. use of fire-fighting foam) are a major source of PFAS contamination in soils and groundwater in the region.

3. Bacteria Water Quality Objectives Evaluation Project: August 5, 2020 Public Information Meeting – Ed Hancock

At 6 p.m. on Wednesday, August 5, 2020, staff led a public meeting for the Bacteria Water Quality Objectives Evaluation Project (Bacteria Evaluation Project). To observe social distancing protocols resulting from the COVID-19 public health emergency, all meeting attendees and staff participated remotely via the Zoom online platform or watched the meeting through the CalEPA's meeting webcast service. The purpose of the meeting was to discuss elements of the Bacteria Evaluation Project, to provide a public forum for interested parties to ask questions of staff, and to provide staff with their observations regarding bacteria water quality objectives in the Lahontan Region. The meeting was recorded and [is available](#) on the [Bacteria Evaluation Project webpage](#).

On July 16, 2020, Lahontan Water Board staff circulated an [Information Video Presentation](#) about the Bacteria Evaluation Project. The video presentation provided background regarding bacteria water quality, water quality objectives, Lahontan Region bacteria regulations, and some of the potential policy options for the Bacteria Evaluation Project. The intent of the video presentation was to provide a Bacteria Evaluation Project update to interested parties and promote discussion at the August 5 live online meeting. The forty-minute video and was viewed 114 times prior to the August 5 meeting.

The 90-minute meeting was attended by thirty-nine individuals, nineteen of whom actively participated through the Zoom online platform and twenty who watched the meeting via

webcast. Attendee affiliations ranged from private citizens with interests in bacteria water quality, Water Board staff with interests in the Bacteria Evaluation Project, and staff from external organizations such as the California Cattlemen’s Association, Los Angeles Department of Water and Power, county government representatives, legal representatives from ranching interests, and private consultancy firms. Two Native American Tribes, the Bishop Paiute Tribe and the Big Pine Paiute Tribe, were also represented at the meeting.

Attendees to the meeting who submitted questions and comments included private citizens, consultancy firms, a lawyer for Centennial Livestock of Bridgeport Valley in Mono County, and the Inyo/Mono Agricultural Commissioner. Question topics included technical aspects of potential project options, antidegradation concerns, clarifications on bacteria water quality and fecal indicator bacteria, and a likely timeline for the Bacteria Evaluation Project. Comments from the public highlighted the outstanding quality of some of the Region’s surface waters, the value of water contact recreation in the Lahontan Region, and a desire to ensure continued bacteria protections for such waters. One commenter also offered a potential project strategy for staff to consider.

Lahontan Water Board staff appreciated those who took the time to join the online meeting and provided feedback about the Bacteria Evaluation Project, and would like to thank staff members from a range of Water Board offices and programs who provided their assistance and ensured a successful meeting. A total of twelve Water Board staff were actively involved in planning and executing the event, including Region 6 Planning and Assessment Unit, Cannabis Unit, and Enforcement Unit staff, staff from the State Water Board’s Office of Information Management and Analysis, Office of Public Participation, and Office of Chief Counsel, and staff from CalRecycle’s Audio/Visual Services office who facilitated the meeting webcast.

The November 2020 Lahontan Water Board meeting will include a workshop on the Bacteria Evaluation Project. Staff will provide an update to the Board about the Bacteria Evaluation Project, including more information gathered during the August 2020 public meeting, and will seek Board input and direction on potential project strategies.

4. Surface Water Ambient Monitoring Program (SWAMP) Implementation Plan – *Kelly Huck*

In response to the SWAMP Core Programmatic Review presented at the July 2019 board meeting, SWAMP staff have developed an Implementation Plan that includes four recommendations to improve and modernize the current SWAMP program. The Implementation Plan is a spreadsheet-based document that describes tasks staff have identified to address the recommendations, as well as task timeframe, funding mechanism, and priority. As new opportunities and needs arise, additional tasks can be added to the Implementation Plan, as it is meant to be an “living” document that can accommodate emerging issues. The document will also track completed tasks and therefore be a reference for SWAMP efforts.

Outline of Implementation Plan Recommendations and Tasks

- 1) Re-evaluate monitoring to improve the program and address new challenges, including the following tasks:
 - a) Evaluate the health of the Region’s waters and watersheds, including special studies
 - b) Adjust Monitoring to adapt to climate change
 - c) Analyze and report on trends of water quality changes in the Region including 20 years of SWAMP data

- 2) Identify opportunities to improve program efficiency
 - a) Improved internal coordination and support between the Water Board's SWAMP and Regulatory, Enforcement, and Planning programs
 - b) Increase stakeholder partnerships to improve monitoring efforts
- 3) Maximize data access and uses of analytical tools using new technology and report out on trends and other observations
- 4) Integrate Water Board Priorities in SWAMP more effectively

Criteria Used for Prioritizing Tasks

Nineteen tasks have been identified to address the above recommendations. In order to determine which tasks to prioritize a scoring tool was developed. Implementation Plan tasks are scored using the following criteria, equally weighted:

- Protect Human Health and Aquatic Life
- Protect/Improve Aquatic Resources & Surface Water Quality
- Supports Disadvantaged Communities
- Responds to Climate Change
- Project Already Implemented/Resources Secure
- Collaboration with External or Internal Resources

The first four task prioritization criterion are Region 6 Water Board priorities (2019 Key Efforts from 2019 Priorities and Accomplishments Report). Inclusion of Water Board priorities as prioritization criteria ensures that Recommendation 4 (Integrate Water Board Priorities into SWAMP more effectively) is addressed by the SWAMP Implementation Plan. As Water Board and SWAMP priorities evolve criteria may change, as well. The sections below describe a selection of Implementation Plan tasks that address the Core Programmatic Review recommendations.

Implementation Plan, Recommendations, and Tasks in more Detail

1a. Evaluate the Health of the Region's waters and watersheds, including special studies

For close to 20 years SWAMP has performed **water quality monitoring** to determine if site specific objectives in the Basin Plan are being met. Routine sampling consists of chemistry monitoring at a network of sampling locations. Staff reviews and adjusts monitoring sites in response to new issues and when new information becomes available. For example, after the Integrated Report is finalized sites are either adjusted to investigate new areas of concern or discontinued if it is determined all beneficial uses are being met. The implementation plan highlights the importance of this large baseline dataset and has included this task to support evaluation of the health of the Region's waters and watersheds.

Special studies have always been an important aspect of SWAMP that allows for intense monitoring in specific locations. Currently, SWAMP is involved in two special studies.

Eagle Lake Bacteria and Nutrients study is a joint effort between SWAMP, the Nonpoint Source unit, and the Guardians of Eagle Lake. The purpose of the project is to evaluate the existing water quality at Eagle Lake and to identify if current land uses along the shoreline (e.g. grazing) may be contributing pollutants (bacteria and nutrients) to the surface water. **Tahoe Keys Laminar Flow Aeration study** is a collaborative project with SWAMP and the Nonpoint Source unit and the Tahoe Keys Property Owners Association. The study is evaluating the effectiveness of laminar flow aeration technology (non-chemical control measure) to control harmful algal blooms.

Another task staff determined to be essential for the evaluation of watershed health is to continue regular **bioassessment monitoring**. Biological assessment (bioassessment) is

an evaluation of the condition of a waterbody based on the organisms living within it. Scientists and managers around the world use this approach to directly and quantitatively measure the ecological health of a waterbody and to monitor the cumulative impacts of environmental stressors on surface waters. Staff is currently working with California Department of Fish and Wildlife to complete a region wide **bioassessment data review** of all available bioassessment data, present findings, and determine new bioassessment monitoring goals.

To support protection of human health, SWAMP prioritizes collecting fish tissue chemistry data to aid the Office of Environmental Health Hazard Assessment (OEHHA) in the development of **fish consumption advisories**. Fish tissue collection will sometimes be conducted in collaboration with Integrated Report/TMDL staff, who have identified waters where data shows impairments that threaten human health.

1b. Adjust Monitoring to adapt to climate change

Many of the tasks support more than one recommendation. For example, **long-term water quality monitoring** supports assessing waterbody health and adapting to climate change by maintaining the Region's long-term permanent sampling locations. The resulting baseline data sets can be used to identify significant trends that may be influenced by climate change. A new task specific to climate change is to install **continuous monitoring** loggers at SWAMP's long-term permanent sites and reference sites.

Another example, of addressing multiple recommendations, is to continue a regular **bioassessment monitoring** program. SWAMP staff plans to collect bioassessment data every 3-5 years at the Region's long-term permanent sampling locations and revisit specified reference sites to monitor changes in the biological integrity of the rivers. Funding additional bioassessment sites for the statewide **Reference Condition Management Program (RCMP)** would help to track changes over time at reference sites throughout the State. Reference sites define the biological conditions expected in healthy streams when human activity in the environment is absent or minimal. Therefore, long term sampling at sites with the no anthropogenic impacts can help reflect possible indicators of climate change.

1c. Analyze and report on trends of water quality changes in the Region including the prior 20 years of SWAMP data

SWAMP is partnering with the San Francisco Estuary Institute – Aquatic Science Center to **analyze and report on water quality trends**. The report, expected in late 2021, will include: status and trends of ~20 years of SWAMP data, prioritizing the program's existing nine, long-term, permanent sites; incorporate findings from the **bioassessment data review**; identify data or information gaps; and recommend potential changes to SWAMP monitoring design.

2. Identify opportunities to improve program efficiency

SWAMP will strive to improve general coordination with internal and external partners. SWAMP will continue to meet with the Regulatory, Enforcement, and Planning programs to familiarize SWAMP with their program challenges and for SWAMP to familiarize program managers with SWAMP tools and resources. SWAMP will also prioritize opportunities with external partners to leverage resources. The Eagle Lake and Laminar Flow Aeration study are two examples of these efforts already implemented.

3. Maximize data access and uses of analytical tools using new technology and report out on trends and other observations

Staff has been working to create and improve upon **data visualization tools**. The goal is for SWAMP data and statistical analyses to be accessible to staff and the public through automated graphical representation that is automatically updated through a connection to the CEDEN database. Lahontan Water Board SWAMP staff has been working closely with the Office of Information Management and Analysis (OIMA) staff to display and interpret water quality data.

Staff presented this tool to the Water Board at the September 2019 Board meeting during the Executive Officer's reports agenda item. A statewide online data dashboard prototype was released July 2020. SWAMP staff will work closely with State Board to expand the Lahontan data visualization interface to include additional sites and statistical analyses.

4. Integrate Water Board Priorities in SWAMP more effectively

SWAMP staff will use the Implementation Plan to guide and track work completed by the program. Developing the Implementation Plan has also been useful for staff to demonstrate that discrete tasks can respond to the Core Programmatic Review recommendations. It is also a tool for SWAMP to communicate its core functions and efforts to continually improve the program to Water Board colleagues.

5. Draft Environmental Impact Report/Environmental Impact Statement Notice of Availability and Tahoe Regional Planning Agency Hearings for the Tahoe Keys Aquatic Weed Control Methods Test Project – *Russell Norman*

The Tahoe Keys Property Owners Association (TKPOA) submitted an application for an individual National Pollutant Discharge Elimination System (NPDES) permit and exemption to a pesticide discharge prohibition prescribed by the Water Quality Control Plan for the Lahontan Region (Basin Plan) for the Tahoe Keys Aquatic Weed Control Methods Test project (Project) in July 2017. The Project is designed to test the efficacy of several aquatic weed control methods, including one-time use of aquatic herbicides to achieve initial knock-down of aquatic weed infestations followed by use of non-chemical aquatic weed control methods for long-term control. Project testing results are intended to support the development of an integrated methods approach to bring aquatic weed infestations under control within the Tahoe Keys Lagoons.

A California Environmental Quality Act (CEQA) Initial Study was performed in 2017 and it was determined that the Project requires a CEQA Environmental Impact Report (EIR) analysis. The Tahoe Regional Planning Agency (TRPA) has also determined an Environmental Impact Statement (EIS), as required by the National Environmental Policy Act (NEPA), is necessary for TRPA permitting actions. TRPA, as lead NEPA agency, and the Water Board, as lead CEQA agency, have agreed to prepare a joint EIR/EIS document for the Project. Currently, both agencies are planning to bring the EIR/EIS environmental analysis and necessary permitting actions before their respective boards by spring of 2021. This schedule is subject to change.

A Notice of Availability with the Draft EIR/EIS was released on July 6, 2020, starting a 60-day public comment period that is scheduled to end on September 3, 2020. The Notice also included a Notice for Tahoe Regional Planning Agency (TRPA) Hearings with an opportunity for public comment at the on-line hearings. The TRPA hearings were held on July 22, 2020 at the TRPA Governing Board Meeting and on August 12, 2020 at the TRPA Advisory Planning Commission Meeting. A webinar presentation on the Draft EIR/EIS was also made to the Stakeholder Consultation Circle (SCC) empaneled for the Project.

Comments on the Draft EIR/EIS were solicited at the TRPA on-line hearings and SCC webinar. David Blau with the League to Save Lake Tahoe (League) commented that the

League feels strongly that all tools need to be tested; the League is skeptical the non-chemical alternative can achieve the project goals and would risk losing three years in getting control of the infestations; and the League was happy to see full analysis of the No Action Alternative and noted that the analysis makes a compelling case for action and minimal delay. Numerous commenters stressed the importance of reviewing the anti-degradation analysis for the proposed project with the Draft EIR/EIS and asked questions regarding the analysis. Commenters also raised concern regarding harmful algal bloom occurrence in the Tahoe Keys Lagoons and questioned whether TKPOA had exhausted all non-chemical methods of controlling the weeds and demonstrated non-chemical methods are infeasible. TKPOA noted that while the Draft EIR/EIS and anti-degradation analyses assume full label application rates for aquatic herbicide use, TKPOA is proposing reduced application rates based on their field studies in the Tahoe Keys Lagoons. TKPOA also commented that since Lake Tahoe is an Outstanding National Resource Water, use of proven tools for control of aquatic weeds should be supported by regulatory agencies.

All Draft EIR/EIS comments received during the public comment period and responses to those comments will be made available following the Draft EIR/EIS comment period.

6. Eastern California Regional Cannabis Program Update – Kathleen Bindl, Carly Nilson, and TJ Middlemis-Clark

Since its inception in 2016, the Eastern California Regional Cannabis Unit, representing the Lahontan and Colorado River Basin Regional Water Boards has issued 320 Notices of Applicability: 149 in Region 6 and 171 in Region 7. Staff have conducted 101 inspections, sent 29 staff enforcement letters, issued 14 notices of violation, initiated 3 ACL complaints at regulated sites in the Colorado River Basin Region, initiated 2 CAOs and an ACL complaint for illicit sites in the Lahontan Region, and reviewed cleanup documentation in relation to an NOV for an illicit site.

Due to the COVID-19 lockdown in the spring, staff cancelled 31 planned inspections in March and early April. Staff then focused on large-scale programmatic efforts, including ongoing enforcement actions. During that time, the 3 ACL complaints in the Colorado River Basin Region were developed. All 3 ACL complaints were posted for public comment in June and have since moved to settlement negotiations. The total proposed administrative liability amount for the 3 ACL complaints is \$621,908.72.

Staff also developed Standard Operating Procedures and Sampling Instructions for collecting water quality data at regulated indoor cultivation sites. These procedures were developed to support a cannabis wastewater characterization study using total maximum daily load (TMDL) discretionary contract funds. The original intent of the study was to have Water Board staff collect system water samples during routine site inspections at indoor cannabis cultivation facilities and use the samples to determine typical cannabis wastewater constituents. However, staff are redirecting efforts to assist permittees in sample collection because of travel restrictions due to COVID-19 health and safety concerns.

In addition to the near-term changes to cope with COVID-19, there have recently been major programmatic changes. After 26 years with the Water Board, Eric Taxer, the cannabis unit supervisor, has retired. Eric Taxer was hired as the cannabis unit supervisor in October 2017 and developed this proficient program. Mr. Taxer served as a mentor to numerous Water Board employees. His contribution to the Water Board is immeasurable and he will be missed.

In addition to Eric Taxer's retirement, the cannabis unit was reduced from six positions, including a supervisor, to two staff-level positions due to significant budget shortfalls. Of

the two remaining positions, one staff person is currently reassigned to contact tracing until at least March 2021. This has resulted in dissolution of the unit and integration of remaining program staff into an existing, different unit.

As part of the reduction in program resources, staff were directed to pivot efforts from regulated site compliance to addressing unregulated cannabis cultivation sites. This involves identifying unregulated sites, prioritizing the abundance of unregulated sites for inspection, coordinating with law enforcement and other state agencies, collecting site data, and pursuing enforcement actions.

Staff have been working on identifying unregulated sites through investigation and outreach. Staff began assisting the State Board Department of Water Rights in the CannaVision project to identify unregulated sites. This effort will provide valuable mapping imagery to identify potential illegal cannabis cultivation sites for further inquiry and enforcement. Staff have also fielded complaints from the public and continue efforts to work with local law enforcement entities to identify if sites are enrolled in the Cannabis permit.

Staff have been working on prioritizing unregulated cultivation site response by implementing the Illegal Cannabis Cultivation Enforcement Strategy Framework. The first step is coordinating with the California Department of Fish and Wildlife (CDFW). This coordination includes determining prioritization criteria for Water Boards staff attending enforcement inspections with local law enforcement to better manage limited resources. The goal includes development of a mapping application to determine when to include Water Board and/or CDFW on enforcement inspections to ensure natural resources are protected.

South Lahontan Region

7. Bishop Area Wastewater Authority (BAWA) – Jehiel Cass

The Bishop Area Wastewater Authority (BAWA) is a new Joint Powers Authority formed on June 30, 2020, by the City of Bishop (City) and Eastern Sierra Community Services District (District). This milestone means that for the first time, the City and District will begin managing its wastewater collection, treatment, and disposal services through a single entity: BAWA. Walt Pachuki, president of the District's board was elected as BAWA's first chair. Deston Dishon, the City's Public Works Director, will begin managing day-to-day operations leading to integrating services for both entities as BAWA's Administrator. After self-organizing (establishing governing rules and procedures), BAWA will focus its efforts on effluent disposal management and optimizing the shared capacity of the two wastewater treatment plants. Integrating the sewer collection systems is a future task.

With the combined systems, BAWA manages nearly 50 miles of collection system, the City's 1.6 million gallons per day (mgd) wastewater treatment plant, District's 0.85 mgd wastewater treatment plant, and disposal percolation ponds and recycled water irrigation areas. The current combined flow from both entities is about 1.5 mgd. The effluent has an estimated 25 milligrams per liter of total nitrogen, primarily ammonia.

BAWA is planning projects to alleviate conditions of nitrate groundwater pollution beneath its disposal facilities. Currently, much of the effluent is discharged to land owned by the City of Los Angeles Department of Water and Power (Department). As shown on Figure 7.1, BAWA and the Department anticipate completing transfer of 434 acres of land to BAWA for future recycled water irrigation. BAWA expects to acquire operational control of the Phase 1 property by the end of 2020, although full title acquisition may take some years longer. BAWA is working with the Department to obtain a "Right to Enter and

Construct” agreement, allowing BAWA to build the initial phase of a fixed, in-ground sprinkler irrigation system on the approximately 165 acres of land that both the City’s and the District’s current discharge permit covers. This first phase would increase irrigated land area by about 200 percent (%).

New pumping and pipeline infrastructure are needed to transport effluent to additional improved irrigated pastureland as shown on Figure 7.1. BAWA’s consultant considered alternatives of different vegetation types to evaluate nitrogen uptake rates for proposed improved irrigated grazed pasture. Irrigated areas seeded with ‘Garrison’ creeping meadow foxtail (Garrison) or a similar mix, could provide forage with the high nutrient nitrogen uptake needed for irrigation using 100% treated effluent. An irrigation period of 8 months (March through October) is operationally feasible for spray irrigation. The goal of this project is for BAWA to achieve a net reduction in nitrogen load to groundwater through increasing irrigation and reducing infiltration of effluent, and thereby reduce nitrates.

The Water Board would require BAWA to manage disposal of treated effluent to protect groundwater quality. Staff will be coordinating the following next steps with BAWA.

- Submittal of a Title 22 Engineering Report to the State Water Resources Control Board (State Water Board), Division of Drinking Water and the Lahontan Water Board for recycled water use on the existing and planned irrigation areas. The existing Tatum Reclamation Site water reclamation requirements (Board Order No. 6-85-69) must be revised by April 8, 2022, as required by the Recycled Water Policy (*Water Quality Policy for Recycled Water*). Subsequent water reclamation requirements may be required separately or combined with new waste discharge requirements.
- Submittal of a revised Report of Waste Discharge and adoption of single waste discharge requirements for BAWA. This would be accompanied by rescission of existing Board Orders for the City (Board Order No.6-94-25) and the District (Board Order No. 94-24).
- Submittal of a single Notice of Intent for covering the BAWA collection system under State Water Board Order No. 2006-0003-DWQ (Statewide General Waste Discharge Requirements for Sanitary Sewer Systems), with rescission of coverage for the existing City and District collection systems.
- Development of milestones for submitting the above items, constructing irrigation infrastructure, implementing a Farm Management Plan, managing winter effluent flows (November – February), integrating monitoring requirements, and metrics for evaluating groundwater nitrate pollution cleanup.

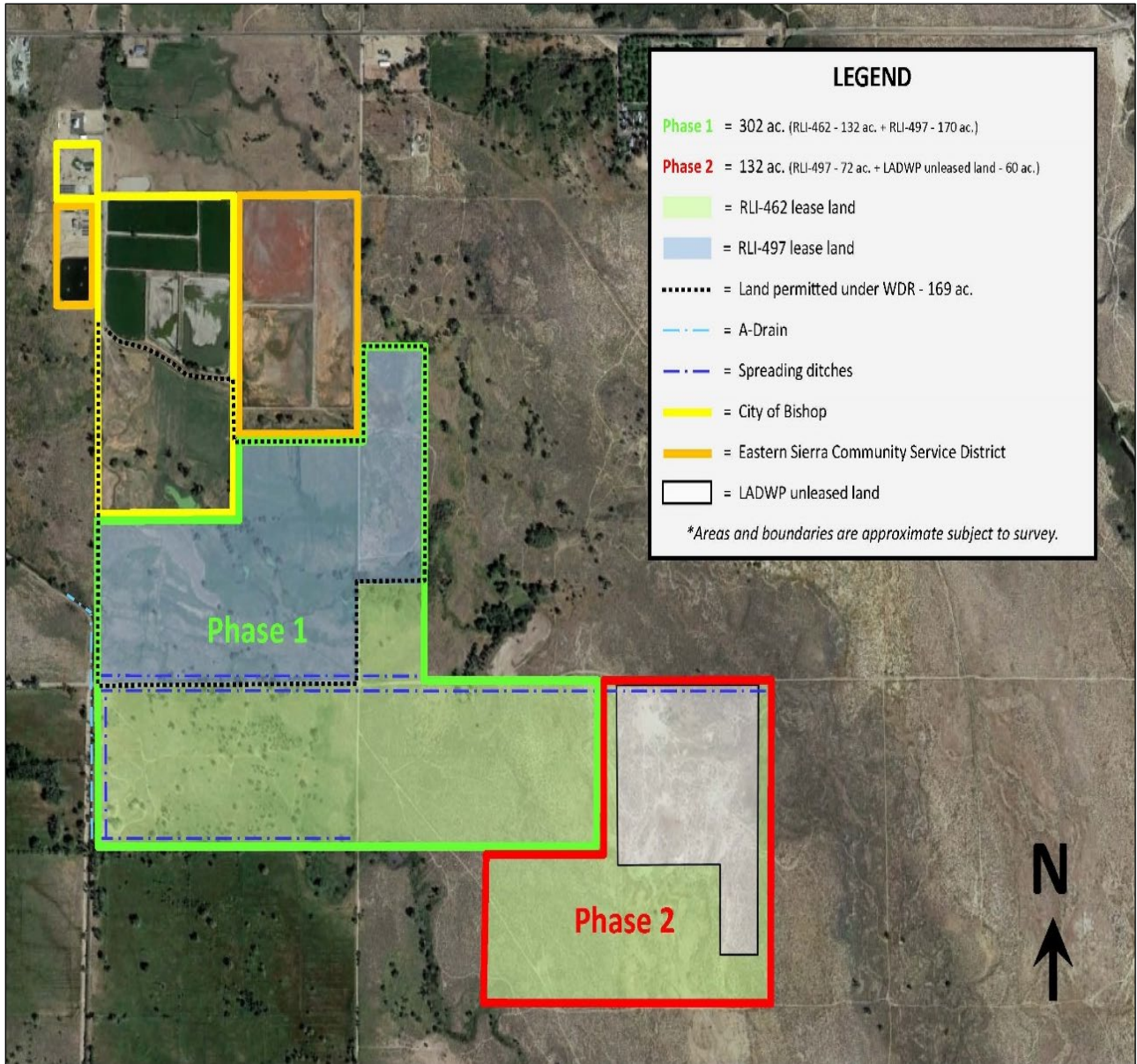


Figure 7.1 – Current BAWA infrastructure is shown with the City’s facilities in yellow and the District’s facilities in tan. Area within the dotted black line is currently authorized for recycled water use under waste discharge and water reclamation requirements. BAWA’s acquisition of 434 acres of Department land would occur in two phases

(Phase 1 outlined in green and Phase 2 outlined in red).



Figure 7.2- BAWA is considering installing on its Department-acquired land a fixed in-ground sprinkler irrigation system to irrigate improved pastureland. This photograph is of a property adjacent to the BAWA wastewater treatment plants showing a similar irrigation system planned for BAWA land.

8. Laurel Pond Monitoring Wells Geophysical Subsurface Investigation, Mammoth Community Water District, Town of Mammoth Lakes, Mono County - *Mark Lemus*

The Mammoth Community Water District (District) recently completed a subsurface geophysical investigation to help them site better locations for replacing the District's groundwater monitoring well network around Laurel Pond at the request of Water Board staff. Laurel Pond is located approximately 4 miles southeast of the Town of Mammoth Lakes (Figure 8.1). Laurel pond is a terminal waterbody of several nearby ephemeral streams and is the effluent disposal site for the District's Wastewater Treatment Plant (WTP). Historically, Laurel Pond had been identified as a wetland on historical topographic maps dating back to the early 1900's. Laurel Pond is a water of the state, but not a water of the United States. Wastewater discharges to the pond are only regulated under the CA Water Code, but not the federal Clean Water Act.

The District currently has a network of four monitoring wells located around Laurel Pond to monitor groundwater; however, some of these wells are seasonally inaccessible or have gone dry (Figure 8.2). As such, the District is working to replace or install new wells. The area near Laurel Pond, like many areas in the Long Valley, is subject to faulting as a result of the historic Long Valley Caldera eruption. An unnamed fault has been mapped approximately 100 yards to the southeast of Laurel Pond and approximately one mile to the northwest. This unnamed fault is assumed to run directly under Laurel Pond and connect on either side in a northwest-to-southeast direction. After reviewing the District's Work Plan to replace the monitoring wells, Water Board staff requested the District

complete a geophysical subsurface investigation (Investigation) of proposed new well locations to better define the extent of faulting and refine the subsurface stratigraphy below and adjacent to Laurel Pond with a goal of ensuring proper placement of new wells.

The Investigation was completed in June 2020, using an electric resistivity imaging survey along two profile lines to the north and east of Laurel Pond (Figure 8.2). The Investigation resulted in the relocation of two of the proposed monitoring well locations to avoid an interpreted unnamed fault (Figure 8.2) and to ensure future drilled boreholes will encounter weathered and fractured basalt (Figure 8.3). The District is moving forward with groundwater monitoring well construction, and completion is expected during Fall 2020.

The new groundwater monitoring well network will help the District and Water Board staff analyze the impact that the District's WTP effluent has on surrounding groundwater. Water Board staff intend to revise the District's waste discharge requirements this fiscal year. Water Board staff has expressed concern regarding the fate and transport of nitrogen species to nearby groundwater from discharges to Laurel Pond, as effluent from the District's WTP disposed into Laurel Pond is currently un-nitrified. This means that most of the nitrogen is discharged as ammonia, which can be toxic to aquatic organisms. Under aerobic conditions, ammonia oxidizes to nitrate (primary drinking water standard is 10 milligrams per Liter). Analytical results from several current groundwater monitoring wells indicate elevated ammonia levels within the groundwater surrounding Laurel Pond, which means that oxidation is occurring further downgradient and in groundwater. Monitoring of the new network of groundwater wells is expected to produce more consistent and representative groundwater sampling results. Water Board staff recommends that the District should pursue upgrades to its existing WTP to reduce overall total nitrogen levels, eliminate ammonia toxicity, and improve water quality in the surface water at Laurel Pond and in the surrounding groundwater.



Figure 8.1. Image of Laurel Pond facing South, taken from site inspection July 10, 2020 (photo taken by Mark Lemus).

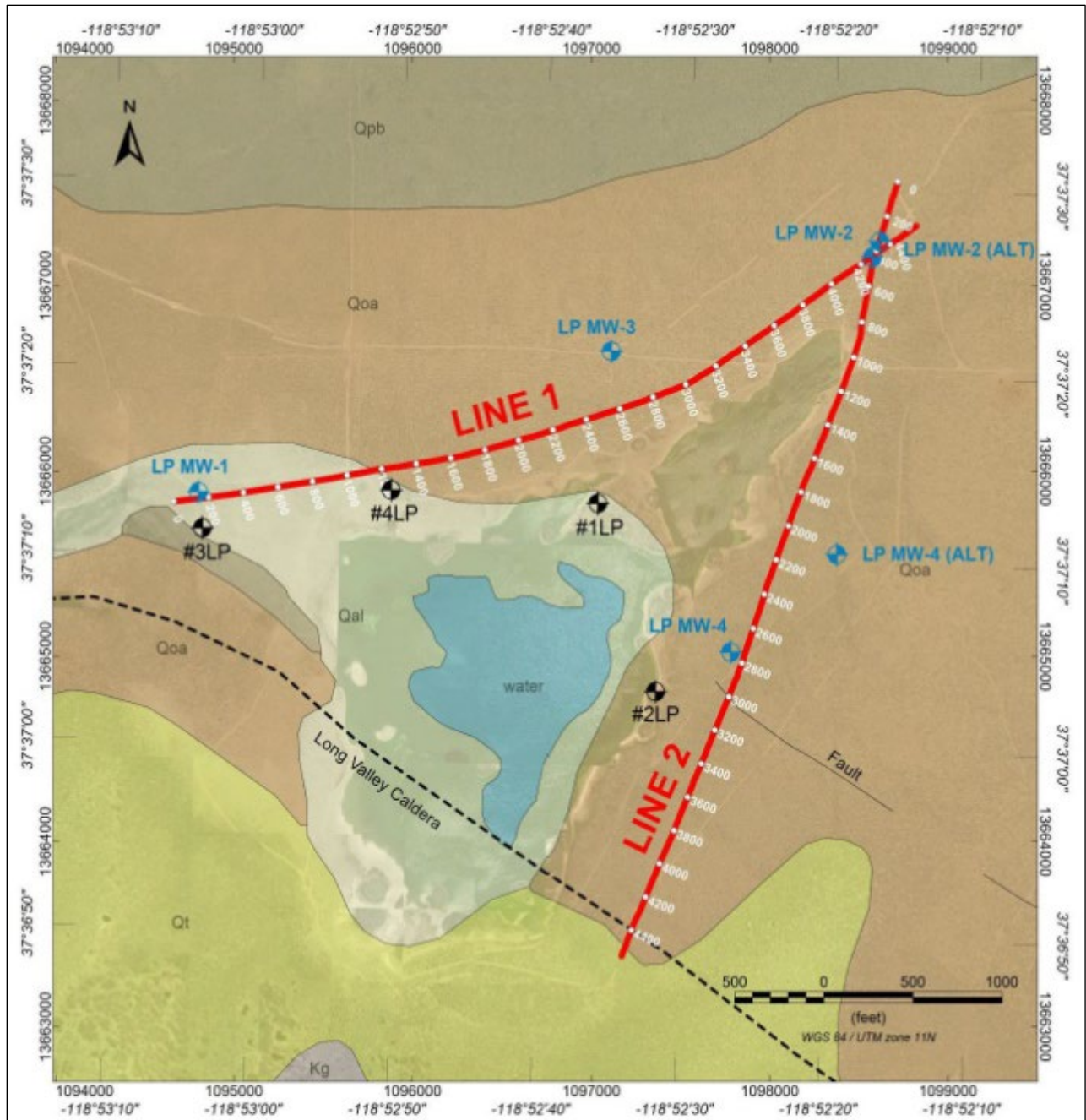


Figure 8.2. Laurel Pond overview map with existing monitoring wells shown in black and proposed new monitoring wells in blue. The two profile lines are the geophysical electrical resistivity imaging survey lines (figure from the District’s Geophysical Report).

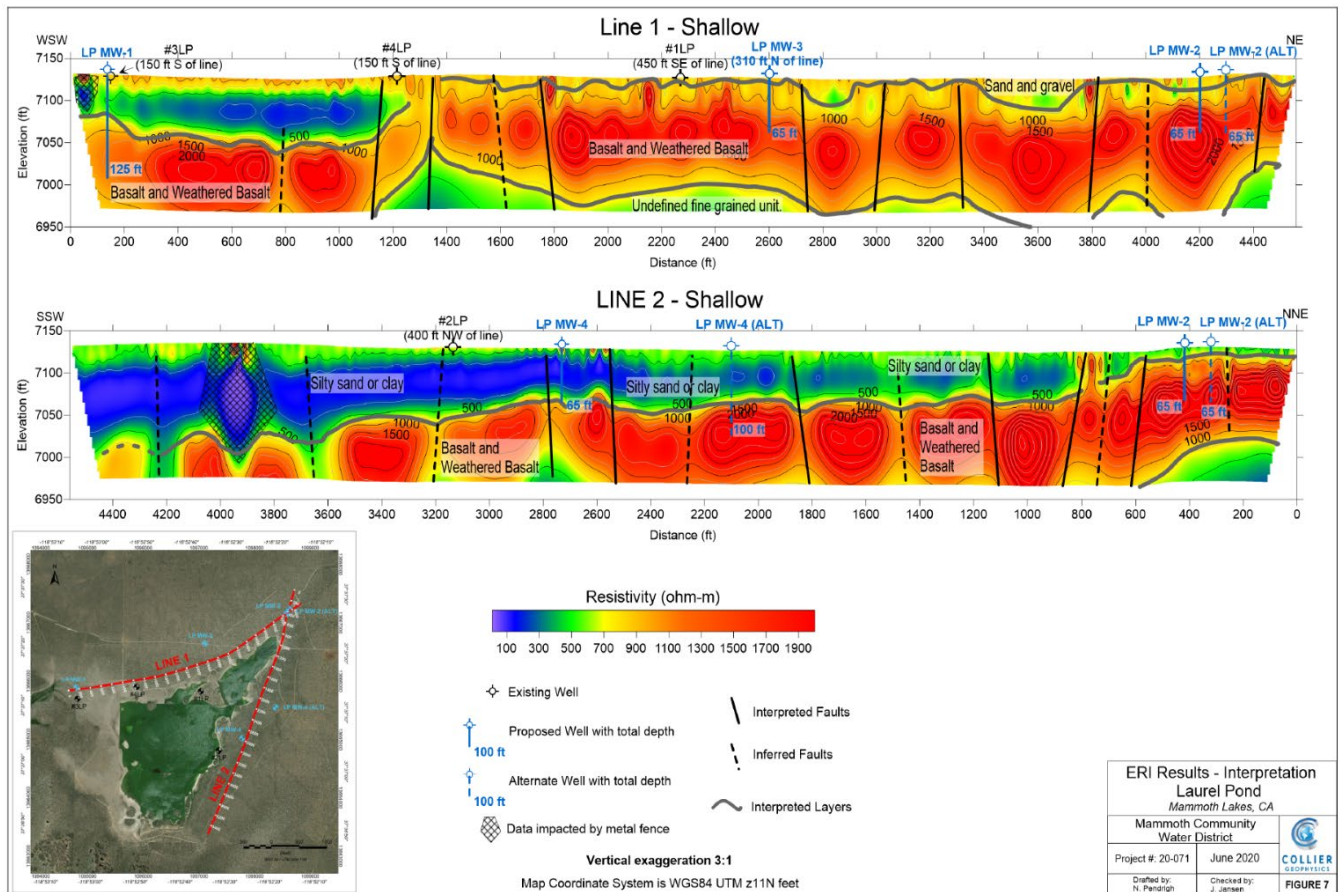


Figure 8.3. Results of the electrical resistivity imaging geophysical survey for Laurel Pond, taken from the District’s Geophysical Report. This figure shows the subsurface geological profiles from the two lines taken along Laurel Pond. Red coloration indicates higher electrical resistivity and a denser geologic material such as rock, while blue coloration indicates lower electrical resistivity correlating to a low-density geologic material such as silt or clay. Offsets associated in changes of resistivity are interpreted to be the result of faulting. Locations for proposed monitoring wells LP MW-2 and LP MW-3 were repositioned based on the survey results.

9. Crestline Sanitation District - Flow Exceedance Violations, Collection System Infiltration and Inflow, Annual Reporting Update – Mark Lemus

The Crestline Sanitation District (District) has submitted the first of five annual reports describing the District’s actions to address wastewater collection system infiltration and inflow (I/I). Water Board staff requested the District begin providing these annual reports in a July 2019 Notice of Violation (NOV). The annual reports must describe the District’s actions for the previous year and planned actions for the upcoming year to address wastewater collection system I/I. Infiltration occurs when groundwater enters the sewer system through defective pipe connections and broken manholes. Inflow is the result of illicit connections such as a house storm drains connected to sewer laterals.

In July 2019, Water Board staff issued an NOV to the District regarding 89 flow exceedance violations from the Huston Creek and Seeley Creek Wastewater Treatment Plants. These violations occurred during abnormally high precipitation events between December 2018 and March 2019. Crestline received a total of 58.2 inches of rain fall during this period that resulted in an approximate total of 2.2-billion gallons of water into the Huston Creek Watershed in a span of five months. The NOV requested that the District evaluate the wastewater treatment plant’s facilities flow and treatment capacities,

considering the increasing number of flow-related violations. The District maintained that the flow violations were the result of long standing I/I- related issues within the sewer collection system, and not related to wastewater treatment plant capacities. The District has, and continues to make, sewer collection system improvements. The intent of the annual reports requested by the NOV is to provide Water Board staff with an assessment of I/I reduction activities. Staff intends to monitor the District's progress.

Wet weather continued through May 2019, increasing groundwater levels in the District's service area. This hindered the District's ability to continue smoke testing to identify illicit connections and failures within the collection systems lines as they were submerged in groundwater. The District was able to inspect 39,545 feet in 2019, through closed circuit television (CCTV) cameras and found a failure in the collection system that resulted in root intrusion (Figure 9.1). These types of failures in the collection system allow for groundwater to enter the system and, eventually, the wastewater treatment plants. This section of pipe was repaired using Cured In-Place Pipe (CIPP) methods (Figure 9.2). The District repaired a total of 3,505 ft of pipe in 2019 using the CIPP method (Figure 9.3). COVID-19 has created an impact on companies providing services for the District and has slowed the process of cleaning, repairing, and televising the collection system.

For the Fiscal Year 20/21 the District intends to focus its manhole repair/ replacement to coincide with the County of San Bernardino's street repaving plan in Crestline. The District has budgeted to purchase four weather stations to monitor microclimates within the District's sewer collection system service area and intends to enter into a 5-year contract with the Hach company to conduct flow monitoring at six problematic areas within the service area. The District will allocate 41% of its maintenance operating budget to address I/I, up from 20% in FY19/20. Water Board staff have observed that the District continues to make addressing I/I a top priority.



Figure 9.1. Broken Collection System Pipe found during 2019 CCTV Inspection showing roots penetrating the sewer (top) and a pipe offset (bottom).

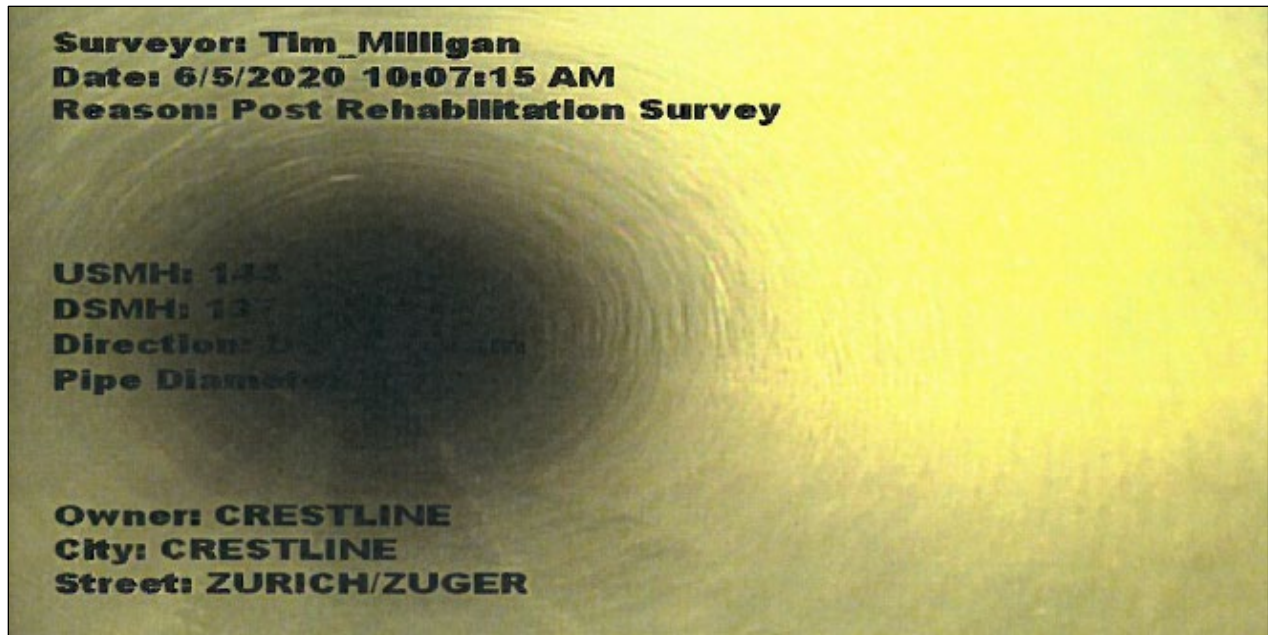


Figure 9.2. Repaired Collection System Pipe after slip-lining completed. Photograph taken at the same location as the broken pipe shown in Figure 9.1.

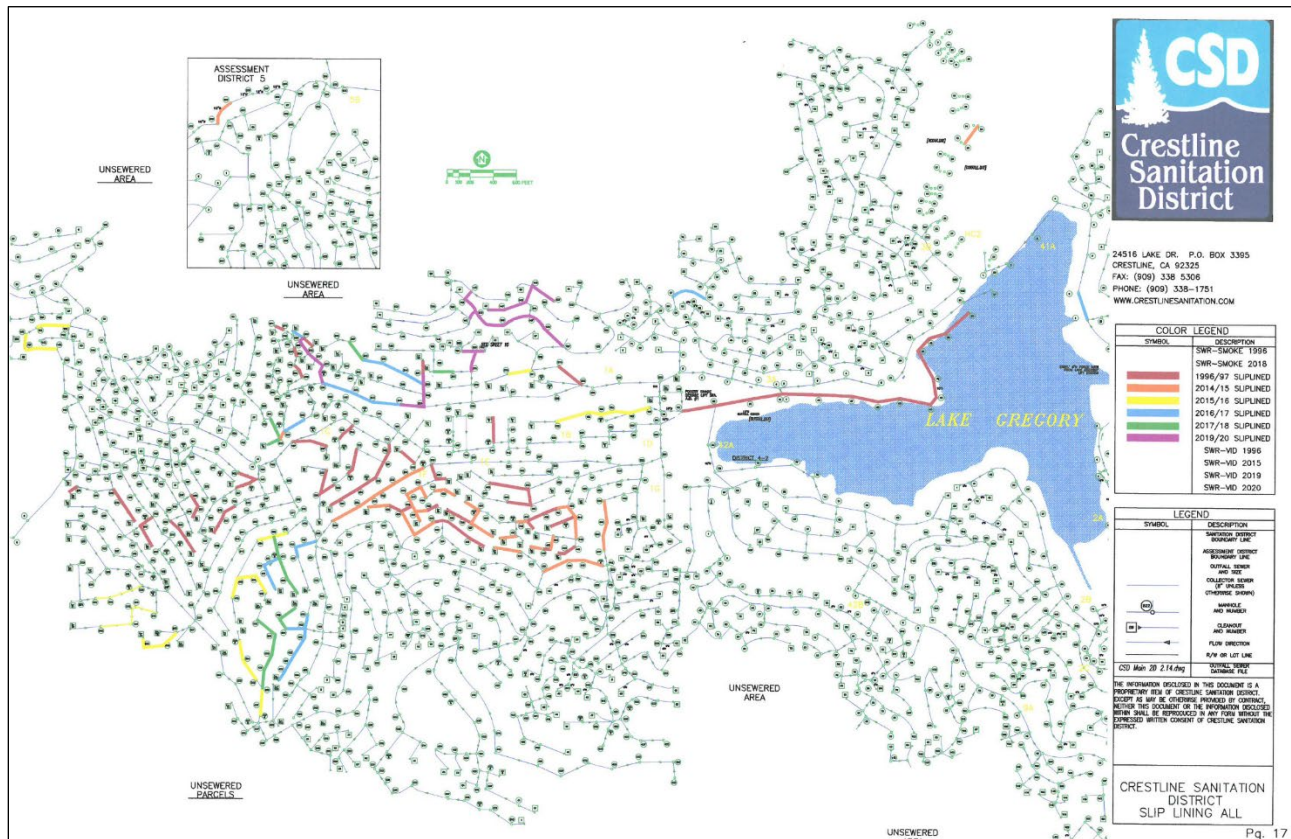


Figure 9.3. Crestline Sanitation Districts Service Area and Collection System Repairs to Date (FY19/20 in Pink)

10. Investigation of Potential Water Quality Impacts on Lower Aquifer in the Vicinity of Upper Aquifer Contamination, Former George Air Force Base, Victorville, San Bernardino County – Linda Stone

There are three areas of groundwater contamination in the central portion of the former George Air Force Base, located in Victorville. These groundwater plumes have been characterized in the Upper Aquifer (perched aquifer) to varying degrees. The northern plume, Site SS030, is the result of several releases from jet fuel supply lines and underground storage tanks located on and near the flight line. This jet fuel plume is well characterized in the Upper Aquifer. The much larger southern jet fuel plume, Site ST067b, is less well characterized but its boundary is generally defined in the Upper Aquifer. The plume in the center of this area, Site OT069e, consists of trichloroethene (TCE). This plume is migrating and is not adequately characterized or delineated in the Upper Aquifer.

Very few groundwater monitoring wells are installed in the Lower Aquifer (regional aquifer), and none of the Lower Aquifer groundwater monitoring wells are in locations that can adequately evaluate impacts from the Upper Aquifer plumes. The Air Force maintains that the presence of a clay aquitard in this area protects the Lower Aquifer from any downward migration of contaminants. Water Board staff's experience is that, in most cases, aquitards allow some migration to underlying zones and there is site-specific evidence that downward migration is likely occurring here.

Over the past eight years, Water Board staff has repeatedly insisted that the Air Force investigate this portion of the Lower Aquifer and install additional Upper Aquifer monitoring wells at the poorly characterized TCE plume, Site OT069e. The Air Force recently agreed to install four monitoring wells in the Lower Aquifer and one additional well in the Upper Aquifer at Site OT069e. The installation of these wells began in July of this year and the expected completion date is late August. The installation of the Lower Aquifer monitoring wells is especially challenging because of the depth of the wells (approximately 300 feet below ground surface) and because special drilling and well construction practices are necessary to ensure that no Upper Aquifer contamination is introduced to the Lower Aquifer or allowed to migrate into that aquifer.

The drilling effort will provide important information regarding the subsurface geology (e.g., lithologies and thicknesses of the various units). The four Lower Aquifer wells will help determine if contamination has migrated to the Lower Aquifer and provide data for a better understanding of this portion of the Lower Aquifer (e.g., groundwater flow direction and gradient). Based on the evaluation of these data, Water Board staff and the Air Force will be able to determine if additional actions are necessary and what those actions should be.

11. Mono County Collaborative Planning Team Meeting – Ed Hancock and Jeff Fitzsimmons

Lahontan Water Board staff attended the Mono County Collaborative Planning Team (CPT) quarterly meeting on July 30, 2020. The CPT serves as an opportunity for representatives from Mono County, federal, state, and local agencies, along with tribal representatives and private citizens to share information, voice concerns, and provides a forum for discussion, coordination, and collaboration of resources and efforts to meet the challenges faced within the County. The meeting focused on the participating agencies' responses to contend with COVID-19.

Most agencies indicated their respective visitor centers and offices remain closed to the public. However, some locations are minimally staffed with most of their staff teleworking in response to COVID-19. Mono County reported the communities within the county continue to be impacted and the number of COVID-19 cases reported within the county have

continued to increase. The Town of Mammoth Lakes has received a COVID-19 assistance grant to support local businesses and provide personal protection equipment supplies.

Caltrans, District 9, informed the CPT that traffic through the region has been, and continues to be, very heavy and is approaching pre-COVID-19 levels. The United States Forest Service (USFS) reported their Inyo and Humboldt-Toiyabe National Forest group campgrounds and remote campgrounds remain closed, while their open campgrounds are full and are experiencing near-record attendance. Insufficient parking, illegal camping, and unpermitted campfires, wildfires, and maintenance of facilities are the challenges Inyo and Humboldt-Toiyabe National Forests continue to experience during this period of high recreational use.

Attendees were informed that the Lahontan Regional Water Quality Control Board Offices in both South Lake Tahoe and Victorville remain open. However, the offices are lightly staffed, with most staff teleworking. Water Board staff assured the participants that staff will continue to follow-up on spills or complaints and respond as soon as possible to emails and voicemails.

The California Department of Fish and Wildlife briefed the CPT on bacterial infections of fish at the Fish Springs, Blackrock, and Mojave hatcheries. Treatment with antibiotics has been ineffective and will subject the fish of all three hatcheries to euthanization. The hatcheries do not anticipate being able to return to normal operations until sometime in 2022. Hot Creek Hatchery remains unaffected.

The Town of Mammoth Lakes announced that the Town had been awarded an Infill Infrastructure Grant for the development of affordable housing and Mammoth Mountain Ski Resort will be moving forward with the "Ski Lodge Project."

The Bureau of Land Management (BLM), Bishop Field Office, informed the CPT that environmental documents for the Alabama Hills National Scenic Area had been submitted for public comment in early July 2020. Additionally, the BLM anticipates receiving Great Outdoor Act Funding and having appropriated funding for the next fiscal year.

The Mono County CPT serves as an example of successful partnership towards better serving the needs of the county and communities within the county. The next meeting is anticipated to occur in late October 2020.

12. Mojave Water Agency Technical Advisory Committee Meeting – *Patrice Copeland*

Water Board staff attended a meeting of the Mojave Water Agency Technical Advisory Committee (MWA TAC) on August 6, 2020. The MWA TAC is an independent, voluntary group of water purveyors, pumpers, and other interested parties located within MWA's boundaries. The MWA TAC meets in a public forum to discuss common concerns and acts to assist the MWA in pursuit of its legal objectives.

During this meeting, Richard Selby of California Rural Water Association gave a brief update on small water systems' business continuity plans and a planned hydrogeologic investigation that is starting to acquire data in the mountain communities. This was followed by Nick Schneider of MWA with an update to the region's Urban Water Management Plan (UWMP), which must be updated every five years. The UWMP is a tool used to ensure that long-term water supply needs are available to meet existing and future demands. MWA ensures that the UWMP is a regional plan that will include data from all urban suppliers in their service area. This 25-year plan will also estimate projected water supplies until 2065. Mr. Schneider reported that the area has conserved water and exceeded a goal of 20 percent (%) by 2020 by exceeding that goal and conserving approximately 39 to 39%. A recycled water use projection is also included in the UWMP,

as is climate change as it may affect water supply. MWA has chosen Tully and Young, Incorporated, to assist with drafting the updated UWMP that is due to be submitted to the Department of Water Resources by July 1, 2021.

A presentation was made by Nick Schneider to update the TAC members regarding Proposition 1 grants for the Integrated Regional Water Management (IRWM) group's activities in both the Lahontan and Colorado funding regions. The Lahontan funding region is non-competitive, and the IRWM group received \$4.1 million for five Round 1 projects; recipients include the City of Victorville (R3 turnout No. 5), Helendale Community Services District (potable groundwater water well No. 10), City of Hesperia (Walnut St. debris basin), and MWA (R3 Adelanto extension, large-scale cash for grass). Within the Colorado funding region, the process is competitive. Although the IRWM group had applied for \$4.45 million, they were only awarded \$500,000 to fund a replacement well for the Big Horn Desert View Water District. More funds for both regions will be available during Round 2 and the IRWM group members, with the assistance of MWA staff, plan to apply for more project funding. Mr. Schneider emphasized that projects that are "shovel-ready" are more likely to be approved.

MWA's Nicholas Schneider, gave an update on pending legislation, including SB 414 (Small Water System Authority Act of 2019, which shortens the pathway for smaller water agencies to join together or consolidate under a larger district), AB 1720 (promotion of long-duration energy storage – enacts a pump storage program to be used statewide, but has widespread opposition by many water and environmental groups), AB 3030 (Resource Conservation: land and ocean conservation goals that will authorize setting aside 30% of California's land), HB 7073 (Special District's Coronavirus Relief – Federal bill that provides financial relief to special districts for costs related to COVID-19), AB 401 (Low Income Rate Assistance Program for qualifying customers of water agencies), and an update on proposed legislation from the California Department of Fish and Wildlife to list the Western Joshua Tree as an endangered or threatened species. This proposed legislation is opposed by building trade organizations. In addition, MWA has sent correspondence to the Fish and Wildlife Commission, that meets on August 20, 2020, opposing this proposed legislation as it may impact well citing locations, and pipeline and other construction projects in the region.

A vote was taken of the TAC members that approved pursuing SB 200 funding. This Senate Bill, approved by the Governor during July 2019, establishes a "Safe and Affordable Drinking Water Fund" and secures a long-term funding source that addresses the lack of safe drinking water in disadvantaged communities across the state. The State Water Board adopted a funding expenditure plan on July 7, 2020, that provides for a "Safe and Affordable Funding for Equity and Resilience (SAFER) Funding Program." The SAFER Fund provides a set of tools, funding sources, and regulatory authorities designed to ensure that one million Californians who currently lack safe drinking water receive safe and affordable drinking water as quickly as possible. The SAFER Fund will provide \$130 million per year that will be used to develop and implement sustainable solutions for small systems with violations of drinking water standards. The money may be spent on operations and maintenance costs, cost of consolidating with a larger system, provision of replacement water, and funding for administrators to run the small systems. MWA was added to the State Water Board's advisory committee for this program. Within the Lahontan Region, there are \$15.2 million available. Four local water systems are out of compliance due to high levels of fluoride, arsenic or uranium, including the Apple Valley View Mutual Water Company, Bar-Len Mutual Water Company, Daggett Community Services District, and Juniper-Riviera County Water District. California Rural Water Association is working with these water systems for SAFER funding opportunities. In

addition, “at risk districts” in the MWA service area were also listed. TAC members were urged to contact Mr. Schneider if they believe they should be added to this list.

Lastly, Mr. Schneider walked TAC members through new websites for the California Grants portal and the Federal Grants portal. These portals contain search functions that may help member agencies more easily locate appropriate grant funding opportunities and apply for the funds. Mr. Schneider recommended that all member organizations in need of such funds set themselves a monthly reminder to visit these websites and reminded TAC members that MWA is willing to assist them regarding such opportunities. The California grant portal is located at <https://www.grants.ca.gov> and the Federal grant portal can be accessed at <https://www.grants.gov>.

The next TAC meeting is scheduled for October 1, 2020.

13. Soil Excavation Activities to Achieve Remedial Action Objectives at Marine Corps Logistics Base (MCLB) Barstow, Comprehensive Environmental Response, Compensation, and Liability Act Areas of Concern (CAOCs) CAOC 10 and CAOC N-2 Area 1, Operable Unit (OU) 7 – Christopher Avalos

CAOC 10 is located at MCLB Barstow, Nebo Main Base and is wholly contained within the base boundary (Figures 13.1 and 13.2). CAOC 10 was used as a source of borrow material (an area of clean, uncontaminated soil that was mined for use at different locations on base) until approximately 2000, when the Navy discovered sodium-filled valves, metal debris, and an unidentified canister within the former borrow area. The Navy determined that material found at CAOC 10 was consistent with a previous MCLB employee’s account of a site at Nebo Main Base where sodium valves were disposed in the late 1950s. As a result of past activities at CAOC 10, elevated concentrations of lead have been identified in soil at concentrations above industrial cleanup-levels (levels designated as unsafe for industrial/construction workers, as well as potential residential inhabitants).

CAOC N-2 Area 1 is a 17-acre site, also located at MCLB Barstow, Nebo Main Base, and wholly contained within the base boundary (Figures 13.1 and 13.2). Historically, military equipment was stored at the site from the early 1950s until 1966. The area was repurposed as a skeet and trap shooting range that operated from 1982 to 1999. As a result of these past activities, soil at CAOC N-2 Area 1 is contaminated with lead, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) at concentrations above industrial cleanup levels.

On December 12, 2014, a Record of Decision (ROD) was signed by the Department of the Navy (Navy) and regulatory agencies, outlining remedies for all sites within OU 7, including CAOCs 10 and N-2 Area 1. During the remedial design, the Navy and its contractor determined that the remedy outlined in the ROD would not meet remedial action objectives (RAOs) at CAOC N-2 Area 1; RAOs were achievable as outlined in the ROD for CAOC 10. An Explanation of Significant Differences (ESD) document was developed and approved by the regulatory agencies that modified the remedial approach at CAOC N-2 Area 1. In summary, it was determined that lead and PAHs would be cleaned up to industrial levels at CAOC 10. At CAOC N-2 Area 1, lead and PCBs would be cleaned up to residential levels (safe levels for potential residential inhabitants) and PAHs would be cleaned up to industrial levels.

Remedial action field activities were conducted from April through June 2019 and included: pre-excavation soil and gravel sampling, excavation, sieving (of larger cobbles) and off-site waste transportation and disposal, post-excavation sampling and surveying, and site restoration. Through pre-excavation soil, gravel, and cobble sampling, the Navy

demonstrated that site contaminants were not present in the larger gravel and cobble size fractions; therefore, the larger-sized materials did not require transportation and disposal, and could be reused for site restoration. Post-excavation sampling demonstrated that RAOs were achieved for all constituents at both sites. Approximately 759 truckloads of contaminated soil, weighing nearly 20,000 tons, were transported offsite for disposal at a properly licensed facility. The CAOCs were restored to previous topographic grades, as needed, and creosote bushes were planted to restore sensitive habitat.

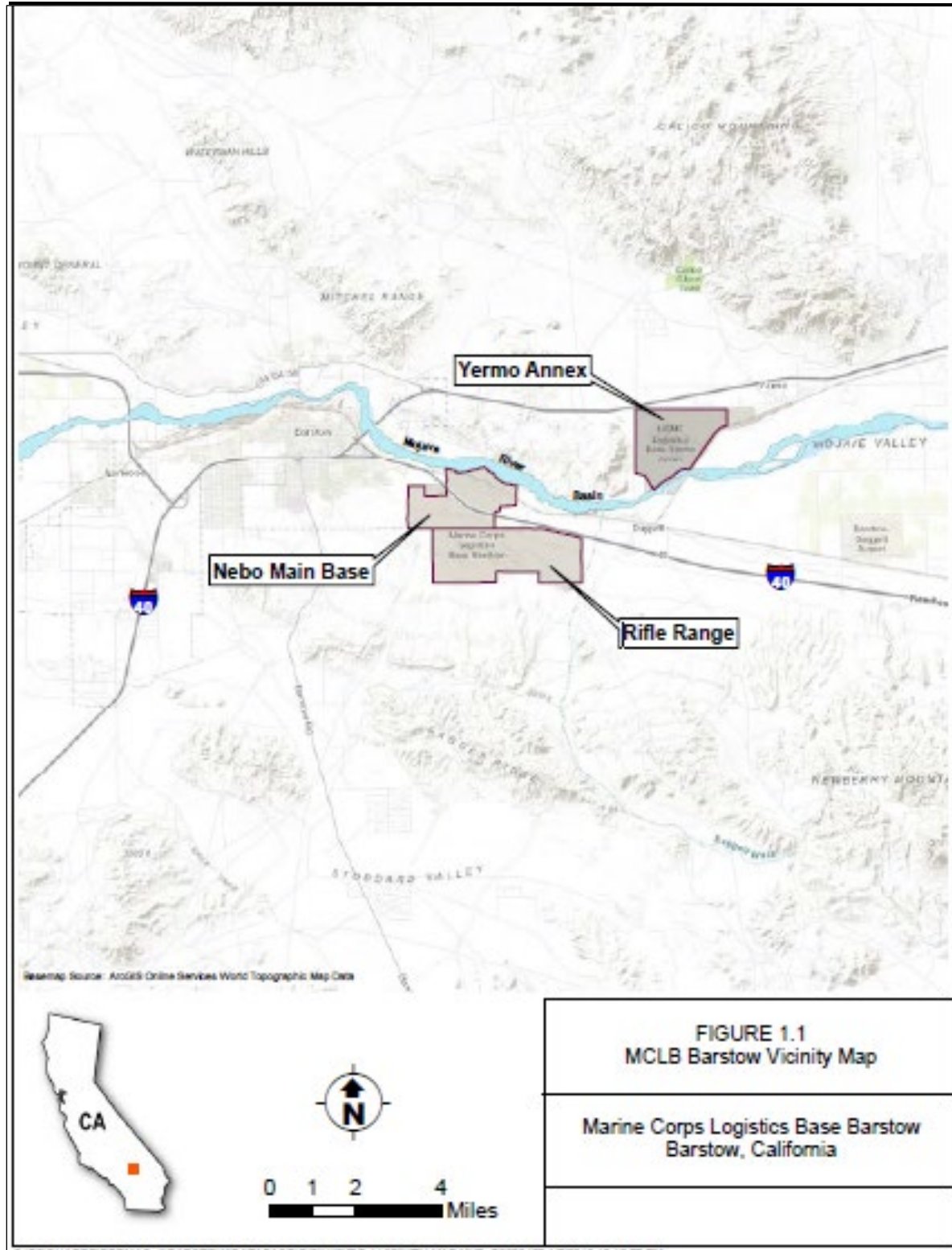


Figure 13.1 – Regional Location Map of MCLB Barstow

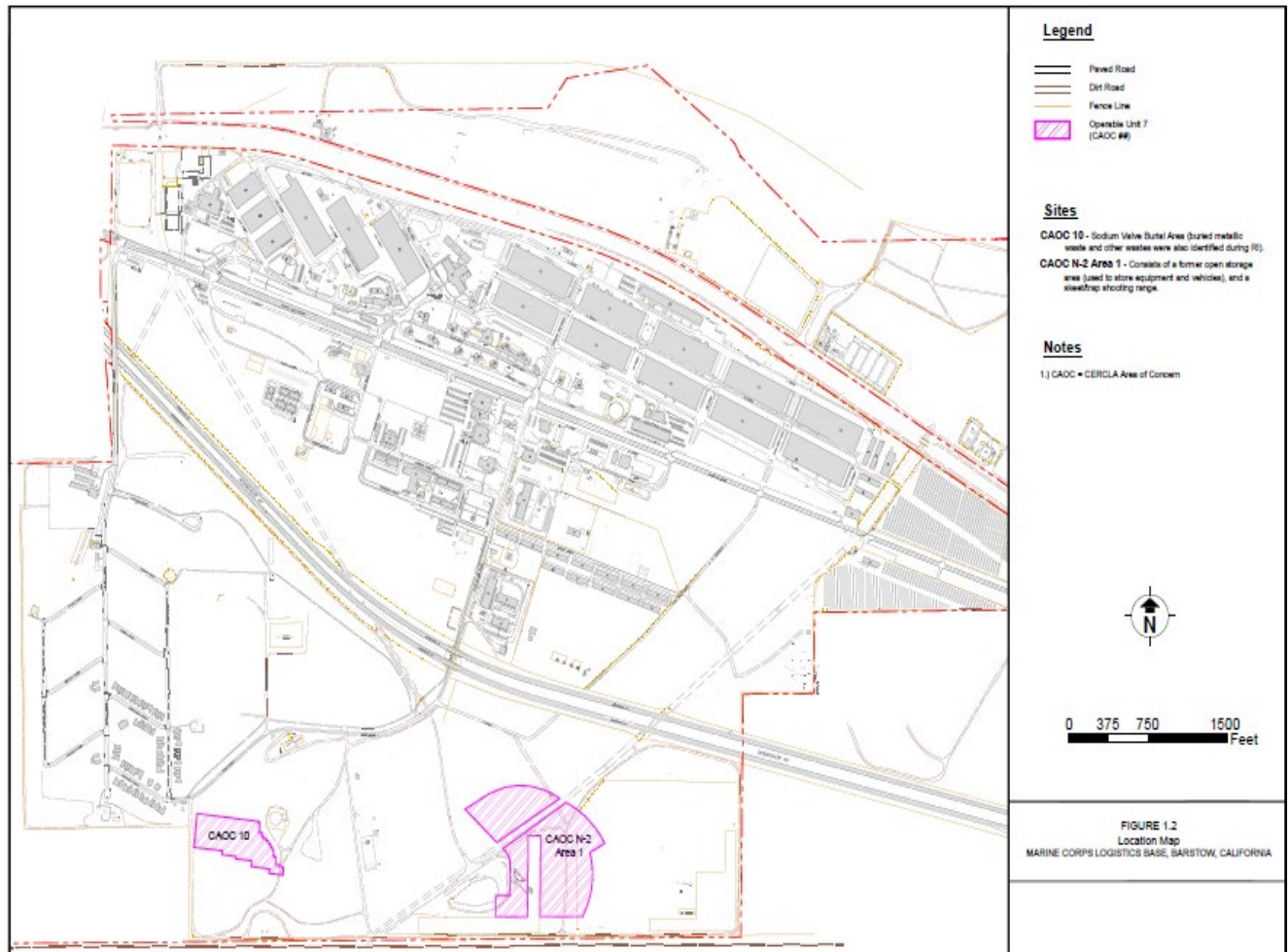


Figure 13.2 – Nebo Main Base - CAOCs 10 and N-2 Area 1 Site Map

14. Standing Item – Sanitation Districts of Los Angeles County, District No. 20 Palmdale, Groundwater Nitrate Site Clean Up Project – Mark Lemus

This standing item describes the Sanitation Districts of Los Angeles County, District No. 20 Palmdale’s (District’s) continued efforts to cleanup nitrate polluted groundwater resulting from historical effluent discharges. Historically, the Water Board authorized the District to dispose its effluent by land disposal through spreading on a 320-acre site. The Water Board required the district to install groundwater monitoring wells to evaluate the effect of land spreading practices on receiving groundwater. In 2003, Cleanup and Abatement Order (CAO) No. R6V-2003-0056 was issued requiring the District to delineate and remediate nitrate polluted groundwater.

In 2004, Cease and Desist Order (CDO) No. R6V-2004-0009 was issued requiring the District to take actions to reduce the source of nitrate loading to groundwater. The District upgraded the wastewater treatment plant to produce higher quality effluent; lined storage reservoirs were constructed to contain excess effluent produced during the winter; and the agricultural operation was expanded to irrigate crops at agronomic rates so that nitrogen is removed by the crops. In acknowledgement of these improvements in the wastewater treatment and disposal operations, the Water Board issued revised Waste Discharge Requirements in Board Order No. R6V-2011-0012. The CDO and one amendment were rescinded with Board Order No. R6V-2011-0046 on June 9, 2011.

The CAO remains in effect and requires the District, as the discharger, and the City of Los Angeles World Airports (LAWA), as the landowner, to address groundwater nitrate pollution near the District's Palmdale Water Reclamation Plant (Facility). The groundwater nitrate pollution is the result of the Facility's previous use of unlined oxidation ponds and land application of wastewater effluent. This Order requires delineation, containment, and remediation of the groundwater nitrate plume and to reduce the amount of nitrate from reaching groundwater.

Previous Actions to Date

Following the issuance of the CAO, the District implemented its interim Containment and Remediation Plan (Plan) approved by the Water Board in 2005. The District's Plan includes source control, delineation of the nitrate plume, extraction of polluted groundwater, and operation of a 2,680-acre Agricultural Site with nitrogen removed by harvested fodder crops. The Agricultural Site is leased from LAWA and has soil moisture probes, lysimeters, and monitoring wells installed for evaluating agronomic irrigation rates and nitrogen concentrations in the soil, groundwater, and uptake of the crops.

In 2006, the District installed six groundwater extraction wells in the center of the nitrate plume. Water produced from this extraction system was initially mixed with treated wastewater effluent and used to irrigate the Agricultural Site crops. The District's monitoring and reporting program indicated that application of effluent and extracted polluted groundwater to crops was performed within agronomic irrigation rates.

In 2009, the District installed two geomembrane-lined reservoirs located about nine miles northeast of the wastewater treatment plant (not shown on the figures). These reservoirs store the entirety of the District's effluent produced during the winter season when crop demand is low. The reservoirs provide seasonal storage of treated effluent water that is used during the summer growing season for crop irrigation. This allows the District's farming operation to match the available volume of water on an annual basis with the agronomic crop demand. During the winter, when evaporation and crop evapotranspiration are low, water is stored and used during the summer growing season when evapotranspiration rates are high.

In March 2011, the Board Adopted revised Waste Discharge and Water Recycling Requirements (Board Order No. R6V-2011-0012) for the Facility that included treatment process upgrades for the Facility. The facility upgrades were placed online in July 2011, and now provide tertiary, denitrified, recycled water for irrigation.

In 2015, the Board allowed the groundwater from the extraction wells to be used on the fields of a neighboring sod farmer, a tenant of LAWA. To date, the District has installed numerous monitoring wells to further delineate the groundwater nitrate plume and provides monitoring well data to Water Board staff along with Annual Cropping Plans and an Annual Report of the Agricultural Site's Operations. In addition, LAWA has voluntarily agreed to provide the Water Board with an Annual Cropping Plan describing how the farming operations of its lessees use pumped groundwater at agronomic rates.

Nitrate Plume Delineation

The source of nitrate pollution in groundwater was a former 320-acre agricultural land disposal area, shown in purple on Figure 1. Data collected to date from the District's groundwater monitoring well network indicates that the nitrate-polluted groundwater is delineated to a thin strip centered north, south, and west of the former land disposal area. Currently, the highest detected nitrate concentration is detected at 15.8 milligrams per Liter (mg/L) in monitoring well MW-59. This concentration is slightly above the nitrate drinking water maximum contaminant level (MCL) of 10 mg/L.

Declining groundwater levels have caused several monitoring wells to go dry, prompting the District to replace and install new monitoring wells to better define existing upstream and downstream concentrations of nitrate in the groundwater, in compliance with the CAO. While the average depth to groundwater in the vicinity of the Agricultural Site varies from 330- to 498-feet below ground surface (bgs), the average rate of groundwater elevation decline varies from 2- to 6-feet per year across the site due to regional groundwater pumping for municipal and agricultural demands. Declining groundwater levels have also decreased extraction well rates, leading the District to convert two of its extraction wells into monitoring wells. The District has also installed new monitoring wells with directed efforts to define the extent of the nitrate plume in areas that were previously not monitored. The newest of these monitoring wells

(MW-63, MW-64, MW-65, and MW-67) were installed north of Avenue M during February 2018 (Figure 14.1).

Locations of Concern

Data collected to date from the District's groundwater monitoring well network have indicated that groundwater flows northwest, west and southwest from the former land disposal area (Figure 14.2). The groundwater flow directions have resulted in three areas of concern:

- Area A - Domestic supply wells to the north of Avenue M,
- Area B - Air Force Plant 42's drinking water supply well owned by Northrup-Grumman (a major aerospace manufacturer) to the west, and
- Area C - Palmdale Water District's supply well field to the southwest.

Monitoring well samples continue to indicate that nitrate concentrations remain less than the nitrate drinking water MCL of 10 mg/L. Board staff has requested that the District continue to keep a close watch on these areas for changes in groundwater flow direction or increases in nitrate concentration trends.

Future Actions

In the summer 2020, the District intends to submit work plans for installing at least two new monitoring wells. These wells will be in the downgradient direction of the nitrate plume, near areas of concern B and C discussed above.

With recent high precipitation years, and to continue maximizing the supply of recycled water, the District has forecasted a need to increase treated effluent storage capacity during seasonal times of low evapotranspiration at the agricultural site. The District is investigating options for additional storage of recycled water to address these capacity concerns.

In 2019, the District removed 2,200 tons of nitrate as nitrogen from the groundwater through their extraction wells; however, there is no current estimate of the mass of nitrate above the drinking water MCL remaining in the groundwater. It does appear that the nitrate plume concentrations greater than the drinking water MCL are generally stable, as shown by years of monitoring well data collected by District over time.

The most effective action to date to control the nitrate pollution has been the District's upgrades at the Facility for source control that now produces effluent with total nitrogen concentrations of less than 10 mg/L. In addition, the storage reservoirs to contain excess winter flow have allowed the District's farming operation to apply effluent at agronomic rates for nitrogen removal by crops.

Regional Board Staff and the District continue to work cooperatively with the interim remedial strategy with the goal of presenting a final remedial strategy to the Board for consideration in the future

This figure shows the delineated area of groundwater polluted with nitrate concentrations greater than 10 mg/L in the center of the figure with an elongated (north to south) shaped contour. Decreasing groundwater nitrate concentration contours are to the east and west of the nitrate plume. The nitrate source is the former 320-acre land disposal area shown in purple on the figure above.

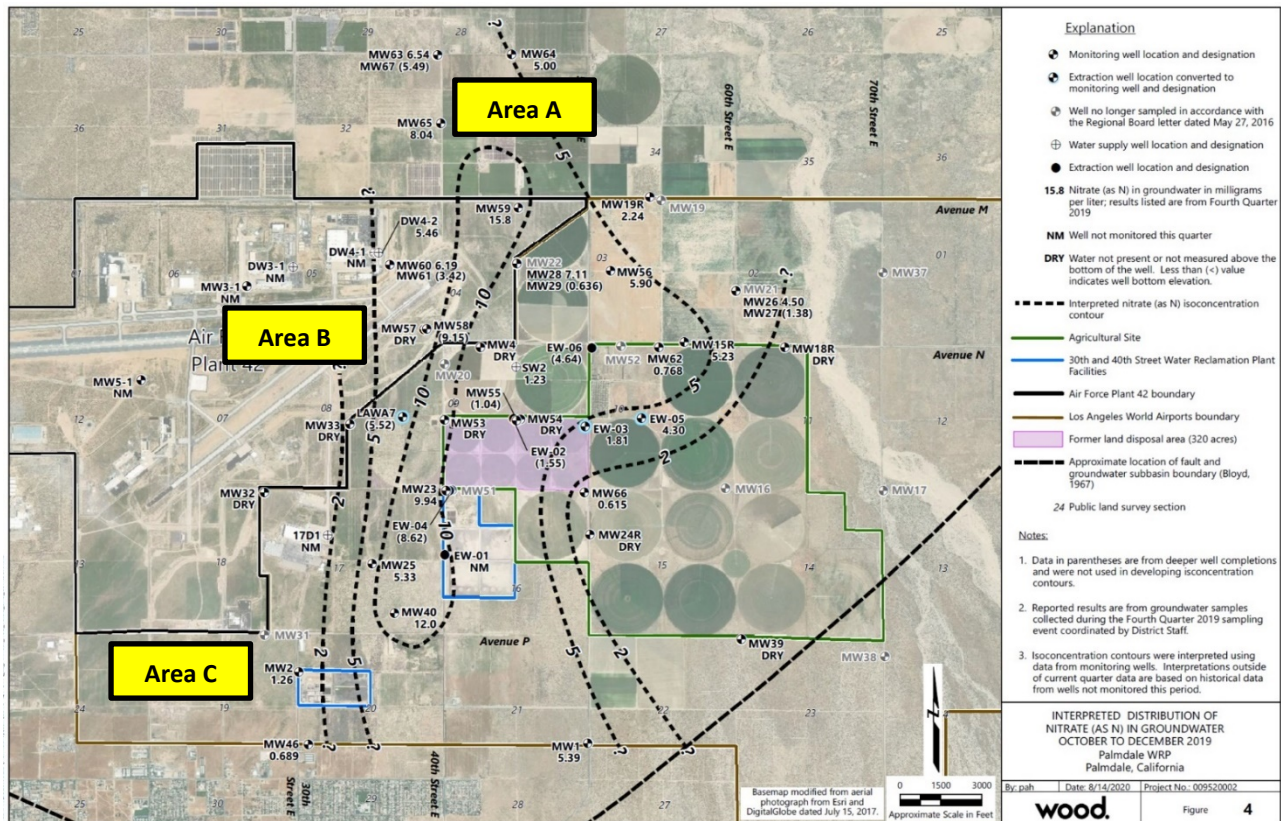


Figure 14.1. Interpreted Distribution of Nitrate as Nitrogen in Groundwater October to December 2019, Palmdale Water Reclamation Plant Annual Report

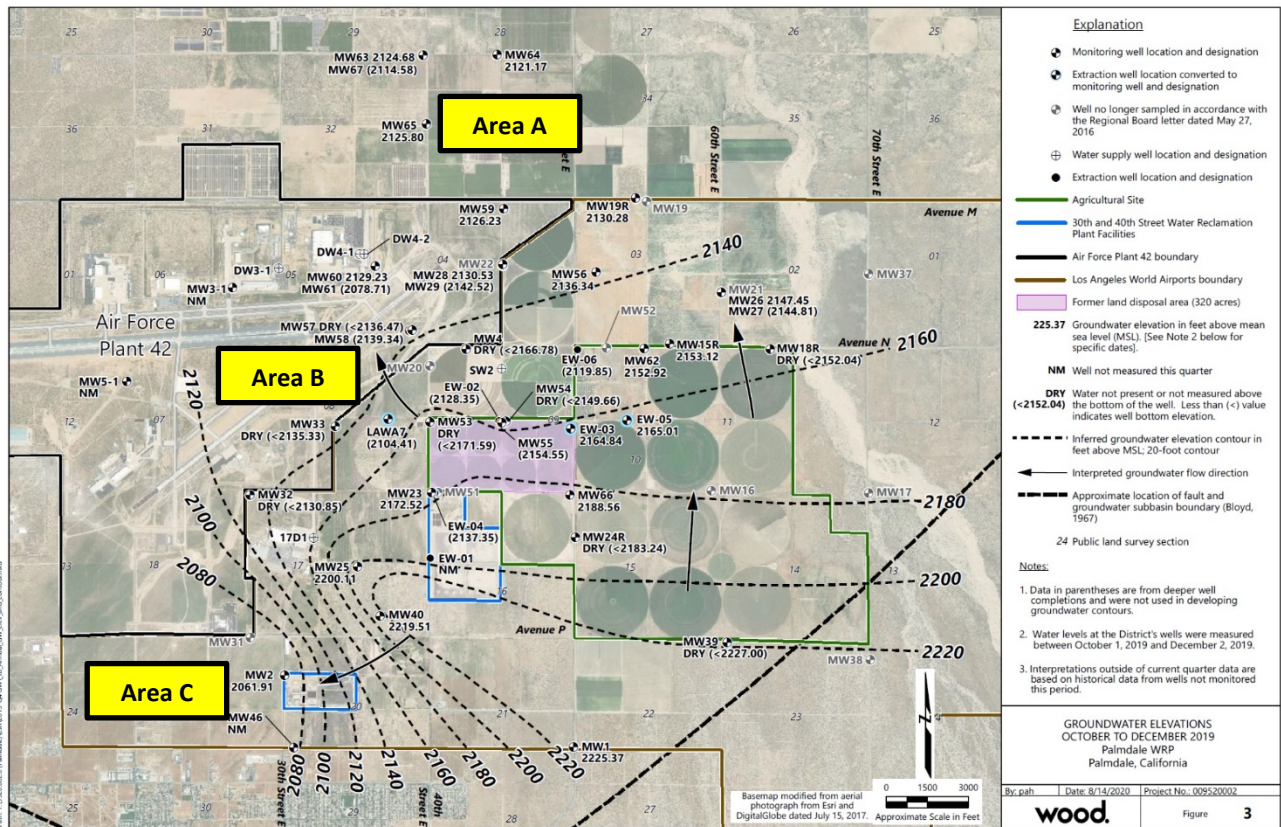


Figure 14.2. Groundwater Elevations October to December 2019, Palmdale Water Reclamation Plant Annual Report.

The Figure shows the iso-contour elevations of groundwater in feet above mean sea level. In general, groundwater flows from the southeast portion of the Figure where Littlerock Creek is a recharge zone, towards the west and northwest. Groundwater elevation contours indicating flow towards the southwest are the result of municipal pumping by the Palmdale Water District's production wells. The nitrate source is the former 320-acre land disposal area shown in purple on the figure above.