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## Lahontan Regional Water Quality Control Board

### **NOTICE OF INTENT TO ADOPT A NEGATIVE DECLARATION AND OPPORTUNITY TO PROVIDE COMMENTS ON THE GENERAL WASTE DISCHARGE REQUIREMENTS FOR IN-SITU AND EX-SITU GROUNDWATER REMEDIATION PROJECTS**

The Lahontan Regional Water Quality Control Board (Lahontan Water Board) is the California Environmental Quality Act (CEQA) lead agency for the General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects (General Order). An Initial Study (IS) has been prepared to assess the environmental impacts associated with the project and determine whether the project will have a significant effect on the environment. Through the IS, Lahontan Water Board staff has determined there is no substantial evidence that the project will significantly impact the environment and a Negative Declaration (ND) has been prepared.

**Project Location:** The General Order is proposed to be applicable throughout the Lahontan Region. The Region is approximately 570 miles long with a total area of 39,210 square miles and is separated into north and south basins. The north basin extends from the Oregon border southward to Conway summit (just north of Mono Lake) and is generally bounded to the west by the Sierra Nevada mountains and the east by the Nevada state line. The south basin extends from Conway summit southward to the San Gabriel and San Bernardino Mountains and is generally bounded to the west by portions of the Sierra Nevada and Tehachapi Mountains, to the south by portions of the San Gabriel and San Bernardino Mountains, and to the east by the Nevada state line.

**Project Description:** Pursuant to Division 7 of the California Water Code, the Lahontan Water Board is proposing to adopt regionwide general waste discharge requirements (WDRs) to regulate discharges of waste associated with remediation activities. The remediation projects eligible for coverage under the proposed General Order include the extraction and treatment of groundwater above ground including using amendments (ex-situ remediation), and the discharge of amendments directly to the vadose zone or groundwater basin to remediate groundwater (in-situ remediation). "Amendments" include biological, chemical, and organic compounds that help to advance/mediate degradation of groundwater pollutants.

The objective of the General Order is to streamline the permitting process to regulate the discharge of waste, including the use of amendments, in a manner that is protective of beneficial uses identified in the *Water Quality Control Plan for the Lahontan Region* ([Basin Plan](#)). Coverage eligibility under the General Order is at the discretion of the

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PETER C. PUMPHREY, CHAIR | MICHAEL R. PLAZIAK, PG, EXECUTIVE OFFICER

Executive Officer and the Executive Officer may decide that the Water Board issue individual WDRs if the remediation project does not meet the eligibility requirements outlined in the General Order. The Executive Officer is also delegated the authority to revise and update the list of amendments and authorize the use of other amendments not listed if the materials are proven to meet specific criteria. The amendments must be proven to effectively remediate targeted constituents and be protective of human health and the environment. All remediation activities must be proven to be effective and protective of water quality and the environment.

**Regulatory Process:** California Water Code, section 13260(a), requires any person discharging waste or proposing to discharge waste within any region, other than to a community sewer system and that could affect the quality of the waters of the state, file a Report of Waste Discharge to obtain coverage under WDRs. The Lahontan Water Board will regulate the discharges of wastes associated with groundwater remediation projects and provide coverage under WDRs with the General Order.

**Document Availability:** The IS/ND and General Order are enclosed and will be available for review electronically at:  
[https://www.waterboards.ca.gov/lahontan/public\\_notices/](https://www.waterboards.ca.gov/lahontan/public_notices/).

**Document Review Period:** The 30-day review period for the IS/ND and General Order begins March 11, 2022 and ends April 12, 2022.

**Comments:** Any person who wishes to comment on the Lahontan Water Board's intent to adopt the ND and General Order must submit written comments no later than 5:00 p.m. on April 12, 2022. Written comments can be sent to: Kerri O'Keefe, Engineering Geologist, Lahontan Water Board, 2501 Lake Tahoe Blvd., South Lake Tahoe, CA 96150 or [kerri.okeefe@waterboards.ca.gov](mailto:kerri.okeefe@waterboards.ca.gov).

**Scheduled Public Meetings:** The Lahontan Water Board will consider adopting the ND and the General Order during a public meeting held on:

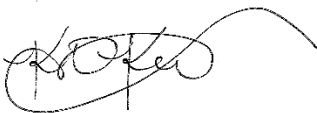
**Date:** June 8 - 9, 2022

**Time:** To be determined.

**Place:** The location information will be available on the Lahontan Water Board internet webpage at:

[https://www.waterboards.ca.gov/lahontan/board\\_info/agenda/2022\\_schedule.html](https://www.waterboards.ca.gov/lahontan/board_info/agenda/2022_schedule.html).

**Government Code Section 65962.5 Evaluation:** It is possible that a project eligible for coverage under the proposed General Order will be located on a site that is listed as a hazardous material site pursuant to Government code section 65962.5. However, the purpose of the proposed General Order is to remediate the sites, eliminating the hazard to the public, and potentially removing the sites from the list.



Kerri O'Keefe, GIT 981

Date: February 23, 2022

Engineering Geologist

Enclosures:

1. Initial Study, Environmental Checklist and Negative Declaration
2. General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects

# **ENCLOSURE 1**



# INITIAL STUDY, ENVIRONMENTAL CHECKLIST, & NEGATIVE DECLARATION

**FOR LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD  
GENERAL ORDER FOR IN-SITU AND EX-SITU GROUNDWATER  
REMEDIATION PROJECTS**

MARCH 2022

LEAD AGENCY CONTACT

**KERRI O'KEEFE**

Engineering Geologist | Cleanup, Site Investigation, & Enforcement Unit | Lahontan Regional Water Quality Control Board

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## I. PROJECT DESCRIPTION

Numerous unauthorized releases of man-made organic constituents, inorganic compounds and heavy metals have occurred throughout the Lahontan Region from activities such as landfilling, mining, composting, dry cleaning, wastewater treatment, sewer/septic systems, dairy operations, agriculture, firefighting, retail gasoline/diesel fueling operations, and automobile/aircraft maintenance. Cleanup of polluted sites (remediation) are designed to improve water quality conditions.

The Lahontan Regional Water Quality Control Board (Lahontan Water Board) has the authority to issue waste discharge requirements (WDRs) to restore, protect and enhance water quality resources to ensure public health, environmental quality, and economic vitality throughout the Lahontan region.

Pursuant to Division 7 of the California Water Code (CWC), the Lahontan Water Board is proposing to adopt General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects (General Order) to regulate the discharges of waste associated with remediation activities. The remediation projects eligible for coverage under the proposed General Order include the extraction and treatment of groundwater above ground including the use of amendments (ex-situ remediation), and the discharge of amendments directly to the vadose zone or groundwater basin to remediate groundwater (in-situ remediation). "Amendments" include biological, chemical, and organic compounds that help to advance/mediate degradation of groundwater pollutants.

The General Order does not establish requirements for groundwater cleanup. Final groundwater remediation levels and groundwater monitoring are separately established through the regulatory programs requiring cleanup and may vary on a site-specific basis. Groundwater cleanup levels are established through submittal of a Remedial Action Plan (RAP), required under the General Order, and are approved by the Lahontan Water Board Executive Officer (Executive Officer) as specified in a Notice of Applicability (NOA).

The objective of the General Order is to streamline the permitting process to regulate the discharge of waste, including the use of amendments, in a manner that is protective of beneficial uses identified in the *Water Quality Control Plan for the Lahontan Region (Basin Plan)*. Coverage eligibility under the General Order is at the discretion of the Executive Officer and the Executive Officer may decide that the Lahontan Water Board will issue individual WDRs if the remediation project does not meet the eligibility requirements outlined in the General Order. The Executive Officer is also delegated the authority to revise and update the list of amendments and authorize the use of other

amendments not listed if the materials are proven to meet specific criteria. The amendments must be proven to effectively remediate targeted constituents and be protective of human health and the environment. All remediation activities must be proven to be effective and protective of water quality and the environment.

### **In-situ Remediation of Groundwater Pollution<sup>1</sup>**

In-situ remediation of groundwater pollution at most sites includes the use and application of biological, chemical, and/or physical treatment processes. These processes may include addition of oxygen, chemical oxidation/reduction, and the addition of nutrients, organic carbon and/or bacteria to enhance biodegradation. The method of delivery is generally direct injection to soil or the groundwater basin. The remediation processes can result in exceedances of water quality objectives that are generally limited in duration and/or in a relatively small portion of the aquifer. The General Order allows exceedances of water quality objectives to occur while oxidation/reduction processes are taking place, but only within the defined treatment zone.

Oxidation/reduction reactions take place when an electron is transferred from one compound to another. The electron donor becomes oxidized, and the electron receptor becomes reduced. These are always coupled reactions. If a compound is reduced, another must necessarily be oxidized to provide the electron. Reducing environments are typified by the absence of oxygen and can be referred to as anaerobic environments. Oxidative environments contain oxygen and are also referred to as aerobic environments.

#### ***Reducing Environment Processes***

The primary reduction processes that are effective for remediating perchlorate, nitrate, sulfate and volatile organic compounds (VOCs) pollution are anaerobic in nature; aerobic processes are generally not effective on most highly chlorinated VOCs. Aerobic dechlorination or aerobic cometabolism of perchloroethene (PCE) and trichloroethene (TCE) has not been successful at most sites. Therefore, reductive dechlorination of VOCs requires development of anaerobic conditions within the groundwater contaminant plume. PCE can be sequentially reduced to TCE, thence to cis-1,2-dichloroethylene, vinyl chloride and finally to ethane. Along the way the rate of reduction, consortium of bacteria involved in the process, and groundwater conditions may change. Reduction of VOCs may even stall at a stage if the correct conditions and bacteria are not present. Perchlorate reduction appears to occur more readily than

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<sup>1</sup> United States Environmental Protection Agency (US EPA), 2000; Interstate Technology & Regulatory Council (ITRC), 2005; ITRC, 2007; US EPA, 2013

VOCs and stalling at a particular stage in the dechlorination process does not occur.

In order to develop a reducing environment to achieve reduction of chlorinated hydrocarbons and perchlorate, concentrations of oxygen and nitrate need to be significantly depleted. Oxygen and nitrate are more easily reduced than the chlorinated compounds and will utilize the electrons preferentially over the chlorinated compounds. Elevated concentrations of dissolved iron and manganese may also inhibit reduction of the chlorinated hydrocarbons by being electron acceptors. There are three types of anaerobic reduction that may be occurring.

**Direct Anaerobic Reductive Dechlorination.** Direct anaerobic reductive dechlorination is a biological reaction in which bacteria gain energy and grow as one or more chlorine atoms on the chlorinated hydrocarbon molecule are replaced with hydrogen. In this reaction, the chlorinated compound serves as the electron acceptor, and the hydrogen serves directly as the electron donor.

**Cometabolic Anaerobic Reductive Dechlorination.** Cometabolic anaerobic reductive dechlorination is a reaction in which a chlorinated compound is reduced by a non-specific enzyme or cofactor produced during microbial metabolism of another compound (i.e., the primary substrate) in an anaerobic environment. For the cometabolic process to be sustained, sufficient primary substrate is required to support growth of the transforming microorganisms.

**Abiotic Reductive Dechlorination.** Abiotic reductive dechlorination is a chemical degradation reaction, not associated with biological activity in which a chlorinated hydrocarbon is reduced by a reactive compound. Addition of an organic substrate and creation of an anaerobic environment may create reactive compounds, such as metal sulfides, that can degrade chlorinated aromatic hydrocarbons.

Of those three, direct anaerobic reductive dechlorination is the primary process for biological reduction of VOCs. In order to accomplish the complete reduction to ethane, the appropriate species of bacteria must be present. Lacking the complete consortium of bacteria could cause the process to stall at cis-1,2-DCE and vinyl chloride. If this condition occurs, adding bacteria that are known to effectively reduce cis-1,2-DCE and vinyl chloride is an option to correct the problem.

Hydrogen has a lead role as a direct electron donor in the anaerobic dechlorination of chlorinated aromatic hydrocarbons. Hydrogen is generated by fermentation of non-chlorinated organic substrates, including naturally occurring organic carbon, accidental releases of anthropogenic carbon (fuel), or introduced substrates such as carbohydrates (sugars), alcohols, and low-molecular-weight fatty acids (lactates, acetates, etc.). As hydrogen is produced by fermentative organisms, it is rapidly

consumed by other bacteria, including denitrifiers, iron reducers, sulfate-reducers, methanogens, and dechlorinating microorganisms.

For anaerobic reductive dechlorination to occur, dechlorinators must successfully compete against other microorganisms that also utilize hydrogen. Generally, there are not sufficient numbers of bacteria naturally present to conduct an effective anaerobic dehalogenation process. To increase the concentration of bacteria biostimulation is implemented by injecting a carbon source or substrate into the groundwater. For the degradation of chlorinated ethenes, the injected carbon source provides for cell growth and ferments to produce products like hydrogen, providing an electron donor for the reductive dechlorination process. By adding electron donors, methanogenic and/or sulfate-reducing conditions can be achieved at a site, which can be used to dechlorinate cis-1,2-DCE and vinyl chloride. Complete reductive dechlorination to ethene without the accumulation of cis-1,2-DCE and vinyl chloride is most likely to occur under these strongly reducing conditions.

Biostimulation also may include injecting limiting nutrients, such as phosphorus or nitrogen. The advantage of biostimulation is that native populations present in the subsurface are already acclimated to the site, so enhancements such as the addition of nutrients will increase their biodegradation capacity. The disadvantage is that subsurface geology of a site may interfere with the introduction of nutrients, including the formation of preferential flow patterns due to fractures and impermeable lithology affecting the distribution of additives. Important subsurface characteristics to consider for biostimulation include velocity of the groundwater, and hydraulic conductivity of the soil. Pilot studies are usually conducted to provide additional site-specific information before full-scale implementation.

Substrates added to promote reductive dechlorination come in many forms and may be soluble, low viscosity, high viscosity or solid. Soluble substrates, such as sugars, citric acid and lactic acid, may be applied in an aqueous phase offering uniform distribution throughout the aquifer. These dissolved substrates travel with advective groundwater flow and are typically applied continuously or periodically. The soluble substrates are consumed rather quickly and must be frequently replenished.

Substrates that are viscous are less mobile than soluble substrates, but they tend to last longer in the subsurface. Slow release materials such as vegetable oil or hydrogen-releasing compounds (HRC™) which are intended to be long lasting, may require a single or limited number of injections. The low mobility of viscous substrates may lead to nonuniform distribution and require different application mechanisms to achieve the desired distributions. These substrates are relatively immobile and rely on advective and dispersive qualities of soluble compounds (lactic acid for the HRC and metabolic

acids for the oil) to deliver them throughout the subsurface.

Moderate viscosity fluids such as emulsions of vegetable oil have a relatively high mobility as compared to solid or highly viscous materials that allows more uniform distribution within the aquifer. Emulsified oils slowly release hydrogen through fermentation of fatty acids. Other moderate viscosity substrates that could be used include, chitin, whey and oleate.

### ***Oxidative Environment Processes<sup>2</sup>***

As with reductive processes, oxidation processes can be either chemically or biologically induced. A chemical oxidant removes electrons from constituents in the vicinity of the oxidant and the oxidant becomes reduced. In a biological oxidation process, one compound is the electron donor and another compound is the electron acceptor. An example of biological oxidation happens with fuel contaminants in groundwater. In an aerobic environment, fuel can provide the carbon and the electrons for microbial metabolism, and the oxidizing agent is oxygen, which is the electron acceptor. In the absence of oxygen, nitrate also serves as an electron acceptor. The fuel becomes degraded as it is oxidized.

Remediation of groundwater pollution, including VOCs, benzene, toluene, ethylbenzene, xylenes, organic pesticides, munitions (i.e., HMX, RDX), petroleum hydrocarbons or methyl-tertiary-butyl ether (MTBE) can potentially be achieved using chemical or biological oxidation processes. This involves injecting oxidants directly into the source and the downgradient plume or delivering oxidants by means of a groundwater recirculation system. The oxidant reacts with the pollutants, producing innocuous substances such as carbon dioxide, water, and chloride. The four main chemical oxidants used are permanganate, peroxide, persulfate and ozone.

The ability of the oxidant to react with a certain contaminant in the field depends on kinetics, stoichiometry, thermodynamics and delivery of the oxidant. On a microscale, kinetics or reaction rates are the most important. The rates of oxidation reactions are dependent on many variables, such as, pH, temperature, concentration of the reactants, catalysts, reaction by-products, and impurities (oxidant scavengers, organic matter, etc.) that all must be taken into consideration.

The oxidant needs to be delivered in such a manner that the oxidant comes into the contact with the pollutant to be oxidized. The delivery goal is to ensure that the oxidant is dispersed evenly throughout the groundwater needing to be remediated. The solubility and rate of reaction of the oxidant need to be considered when developing the

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<sup>2</sup> US EPA, 2000; ITRC, 2005

method of delivery of the oxidant.

### **Ex-situ Remediation of Groundwater Pollution<sup>3</sup>**

Ex-situ remediation of polluted groundwater involves the physical extraction of the polluted groundwater and moving it to another location for treatment above ground. The ex-situ remediation technologies eligible for enrollment under the General Order include pump-and-treat methods with discharge of treated groundwater to the same groundwater basin from which it was extracted. Pump-and-treat methods may include, but are not limited to, adsorption, air stripping, bioreactors, filtration, ion-exchange, oxidation, and metals precipitation. Ex-situ remediation of contaminated soils is not covered under the General Order.

Certain ex-situ remedial technologies have a waste stream that includes salts, sulfides, and spent media which requires off-site disposal at an authorized disposal facility.

#### ***Pump-and-Treat***

Groundwater that contains dissolved inorganic and organic chemicals can be physically removed from the groundwater basin so that the polluted water can be treated at the surface to remove the constituents of concern. If there are non-aqueous phase liquids (NAPLs) present in the groundwater basin, the situation is much more complex than if all pollutants are in a dissolved form. As long as an NAPL is present, the NAPL pollutant will partition between the NAPL phase and the dissolved phase. Light aqueous phase liquids (LNAPL) tend to float on the water table and are relatively easy to remove by pumping. However, dense non-aqueous phase liquids (DNAPL) sink to the bottom of the aquifer and are very difficult to locate and remove. As the polluted groundwater is withdrawn from the groundwater basin for treatment, the clean water that recharges the basin eventually becomes polluted with material partitioning from the remaining NAPL. Because considerable amounts of residual NAPL may remain in the groundwater basin even if the mobile LNAPL is removed, several years may be required for a pump-and-treat system to remove all the residual NAPL by partitioning into the dissolved phase, which can be recovered. In the case of contamination by DNAPLs, especially in fractured rock aquifers, it may be impossible to fully remediate a polluted aquifer to background conditions.

If the dissolved phase of a pollutant sorbs (attaches) onto the mineral matter of the soil, the dissolved phase of the pollutant may desorb (release) as the polluted water is flushed from the pores. Many pore volumes of unpolluted groundwater may be needed to completely remove the sorbed phase of both organic and inorganic pollutants.

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<sup>3</sup> Fetter C. W., 1993; US EPA, et al., 1993; US EPA, 2020

Contaminants that have been in the groundwater basin for a long period of time may diffuse into the less permeable zones (e.g. clays and silts) of porous media aquifers (coarse sand layers with interbedded clays and silts) and into the bedrock matrix of fractured rock aquifers. Pump-and-treat systems are efficient at removing pollutants from the coarse sands and there will be a rapid decline in the concentration of pollutants. Fine grained sediment has a larger surface area per unit volume of the aquifer than the coarse sediment and will sorb more pollution. Polluted water occupying the pores of the fine sand and silt layers will be removed very slowly. If remediation is halted before the sorbed phase is completely removed from the finer grained sands, the dissolved concentration will eventually rise above the level detected at the end of the remedial period as additional contamination desorbs to come to equilibrium with the dissolved phase.

**Adsorption.** Adsorption is a chemical process. Groundwater is pumped through a series of canisters containing activated carbon (or similar media) to which dissolved organic pollutants sorb to the surface of the treatment media and are removed from the groundwater. Activated carbon may be liquid, coal, wood, nut shells or other carbon-rich materials. Periodic replacement or regeneration of the saturated carbon is required. Granulated activated carbon (GAC) can remediate pollutants such as volatile organic compounds, semi-volatile organic compounds, petroleum hydrocarbon fuel, radon and other radioactive materials, and some types of metals.

**Air Stripping.** Air stripping is a physical process. Air is moved through the polluted groundwater in an above ground treatment system. Volatile organics are partitioned from groundwater to a vapor phase by increasing the surface area of the contaminated water exposed to air. Aeration methods include packed towers, diffused aeration, tray aeration, and spray aeration.

**Bioreactors.** Bioreactors utilize a biological process. Contaminants in extracted groundwater are put into contact with microorganisms through attached or suspended biological systems. In suspended systems, such as activated sludge, contaminated groundwater is circulated in an aeration basin where the microbial population aerobically degrades organic matter and produces new cells. In attached systems, such as rotating biological contactors and trickling filters, microorganisms are established on an inert support matrix to aerobically degrade groundwater pollutants.

**Filtration.** Filtration is a physical process. Polluted groundwater is forced through a porous media. The suspended particles in the polluted groundwater are trapped on the surface or within the filter media. Ultrafiltration/nanofiltration occurs when particles in the polluted groundwater are forced through a semipermeable membrane. Only particles that are smaller than the membrane pass through. Other filtration methods

include nanofiltration and reverse osmosis which use similar filtration methods.

**Ion Exchange.** Ion exchange is a physical and chemical process. Ions from the aqueous phase are removed by exchange of cations or anions between the pollutants and the exchange media. Ion exchange materials may consist of resins made from synthetic organic materials that contain ionic functional groups to which exchangeable ions are attached. They may also be inorganic and natural polymeric materials. Resins can be regenerated after the resin capacity has been exhausted.

**Oxidation.** Oxidation can be a physical or chemical process. Ultraviolet radiation, ozone, and/or hydrogen peroxide are used to destroy organic pollutants as water flows into a treatment tank. An ozone destruction unit is used to treat off-gases from the treatment tank.

**Metals Precipitation.** Metal precipitation is a chemical process where soluble heavy metal salts are converted to insoluble salts that will precipitate. The precipitate produced during the process can be removed from the polluted groundwater by physical methods such as filtration. pH adjusters, addition of chemical precipitant and flocculation are used to complete the process. The metals typically precipitate from the solution as hydroxides, sulfides, or carbonates.

## **Remediation Project Category Details**

The remediation activities planned for coverage under the proposed General Order include full-scale and pilot testing in-situ remediation, large-scale ex-situ remediation, and small-scale/pilot testing ex-situ remediation. The proposed General Order establishes the threat to water quality (TTWQ) and complexity ratings (CPLX) for each remediation project type as outlined below. Annual permit fees are assessed based on the TTWQ and CPLX. Details of the [Annual Fee Schedule for each TTWQ/CR](#) can be found on the State Water Resources Control Board website.

### **Full Scale and/or Pilot Test In-Situ Remediation**

In-situ groundwater remediation activities apply the amendments directly to the vadose zone and/or groundwater basin to achieve regulatory compliance with specified cleanup levels. Amendments react chemically or biologically with the pollutants to reduce contaminant mass and concentration. The full list of amendments that are proposed for use are included in Appendix A. In-situ remediation activities have the greatest potential to alter water quality and are subject to a TTWQ Category 2 and CPLX Category A (TTWQ/CPLX 2A).

TTWQ Category 2 discharges are those discharges of waste that could impair the



designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.

CPLX Category A includes any discharge of toxic wastes, any small volume discharge containing toxic waste, any facility having numerous discharge points and groundwater monitoring, or any Class 1 waste management unit.

### ***Large Scale Ex-Situ Remediation***

Large-scale ex-situ groundwater remediation activities extract groundwater for treatment above ground and may use specific amendments included in Appendix A. Ex-situ remediation may include chemical, biological, or physical treatment of targeted contaminants. For example, air stripping removes organic waste without additive amendments. The waste is either reinjected to the groundwater basin or discharged to land when numerical criteria are met. The discharge of treated groundwater from large scale ex-situ remediation projects are defined as having discharges that exceed 10,000 gallons per day. These remediation activities present a moderate threat to water quality and are subject to a TTWQ Category 3 and CPLX Category B (TTWQ/CPLX 3B).

TTWQ Category 3 discharges are those discharges of waste that could degrade water quality without violating water quality objectives or could cause a minor impairment of designated beneficial uses as compared to Category 1 or 2.

CPLX Category B includes any discharge not subject to Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units.

### ***Small Scale and/or Pilot Test Ex-Situ Remediation***

Small scale ex-situ remediation activities are similar in nature to the large-scale remediation projects except less than 10,000 gallons of waste is discharged per day. These projects that are expected to have no or low threat to water quality, human health and the environment are subject to TTWQ Category 3 and CPLX Category C (TTWQ/CPLX 3C).

TTWQ Category 3 discharges are those discharges that could degrade water quality without violating water quality objectives or could cause a minor impairment of designated beneficial uses as compared with Category 1 and Category 2.

CPLX Category C includes dischargers having no waste treatment systems or that must comply with best management practices, dischargers having passive treatment and

disposal systems, or dischargers having waste storage systems with land disposal.

### **Authorized Remediation Amendments**

The General Order identifies a variety of amendments proposed for potential use during in-situ and ex-situ remediation activities. For purposes of this General Order, "amendments" include biological, chemical, and organic compounds that help to advance/mediate degradation of groundwater pollutants and may be applied directly to the groundwater basin in a defined treatment zone or utilized for treatment of polluted groundwater above ground. The list of proposed amendments authorized for use are included in Appendix A of the General Order. The list of amendments includes chemical oxidants, chemical oxidant activators, aerobic bioremediation enhancement compounds, anaerobic degradation enhancement compounds, reduction degradation enhancement compounds, metals precipitation/stabilization compounds, sorption/biodegradation biomatrices, surfactants/co-solvents, bioaugmentation organisms, tracer study compounds, buffer solutions, pH adjusters, biofouling control agents, and adsorption injectants.

The amendments listed do not represent all chemicals that might be used in remediation. The General Order requires that the proposed amendments to be used for remediation be analyzed to determine the suitability of the materials to remediate the target pollutants and be protective of public health and the environment. Approval for use of the listed amendments, or any other chemical, organic, or biological compound that is not listed in Appendix A may only be used under the proposed General Order with approval by the Executive Officer.

Past analyses of various amendments, including corn syrup, molasses, HRC™, and edible oils have shown elevated concentrations of sodium and other salts, and trace metals in some of them. An applicant that proposes using a salt-containing amendment is required to demonstrate that there is no cost-effective, salt-free amendment that can be utilized to achieve adequate remediation of the pollution before allowing the salt-containing amendment to be used. In addition, amendments containing other pollutants such as metals could contribute to exceedances of water quality objectives and/or degradation of the groundwater. By-products produced by the proposed amendment are required to be reported in the RAP.

### **Treatment Zone**

The "treatment zone" means a three-dimensional area being targeted to receive authorized amendments to achieve water quality objectives and protect beneficial uses. Within the treatment zone, a spatial zone of impact exists in which water quality and beneficial uses are temporarily degraded. The treatment zone must be defined in a RAP

required to apply for coverage under the General Order. Degradation of water quality outside the defined treatment zone is prohibited.

The treatment zone is the area where proposed oxidation/reduction processes would take place. During oxidation, several changes in water quality parameters can occur. The oxidation process can cause trivalent chromium present in formation materials and dissolved in the aquifer to be converted to hexavalent chromium, a much more toxic form of chromium. In addition, chlorides will be liberated if the pollutants being oxidized are chlorinated compounds. Increases in salts can occur if the oxidant being used has a salt component such as sodium or potassium.

Reduction processes have similar concerns with chlorides and salts. Reducing conditions will remove dissolved oxygen from the water and can liberate excess concentrations of dissolved iron and manganese from formation materials, and generate methane, causing secondary water quality problems. These WDRs recognize that water quality objectives for some parameters may be exceeded within the treatment zone. However, water quality objectives are not allowed to be exceeded outside of the treatment zone. Monitor wells are established downgradient of the treatment zone for use as compliance wells. The monitor wells are used to measure compliance with water quality objectives and groundwater limitations.

The size of the treatment zone should be made as small as feasible, but in most cases will be driven by the plume configuration and design of the treatment system. The treatment zone could include a transition zone where ambient groundwater mixes with the treatment zone, reestablishing ambient oxidative conditions. In contact with the oxygen of ambient groundwater, the elevated concentrations of ferrous iron and dissolved manganese are oxidized, removing them from solution. Methane concentrations return to ambient concentrations much more slowly and travel further than other reduced species. Therefore, the formation of methane should be avoided to the extent practicable by minimizing the degree of reducing conditions generated by the project. It is not appropriate to significantly increase the size of the treatment zone to simply allow for methane concentrations to reduce back to ambient levels.

### **Authorized Disposal Methods of Treated Groundwater**

Treated groundwater from ex-situ remediation activities, that meets cleanup goals may be disposed to the same groundwater basin from which it was withdrawn by means of subsurface infiltration, re-injection directly to the groundwater basin, surface infiltration, percolation trenches or basins, evaporation ponds, land spreading, spray disposal, irrigation, and discharged to ephemeral drainages. Ephemeral drainages are known to be areas that maximize groundwater recharge in arid environments and therefore this is

an allowable method for disposal of treated groundwater. Prior to authorization of discharge to an ephemeral drainage by the Executive Officer, the Discharger is required to provide evidence of consultation with the US Army Corp of Engineers to determine that the ephemeral drainage is not a water of the US and will not require a Federal Clean Water Act section 404 permit. The discharge of treated groundwater to perennial waters, wetlands and waters of the US are prohibited under the General Order.

In-situ groundwater remediation activities treat groundwater directly in the subsurface, therefore; disposal of treated groundwater will not occur.

### **Waste Discharge Requirements**

The proposed General Order regulates discharges of waste, as defined in the CWC section 13050(g), from remediation projects at polluted sites affected by man-made organic constituents, heavy metals, and inorganics. The in-situ and ex-situ remediation projects covered under the General Order are authorized to utilize amendments within a defined treatment zone to eliminate pollutants from groundwater.

The WDRs included in the General Order outline the requirements for injection of amendments, injection of treated groundwater, discharge of treated groundwater, disposal of investigation derived waste (including soil and groundwater) and receiving water limitations. All WDRs are designed to be protective of beneficial uses and water quality objectives of the receiving waters and the environment.

Injection and disposal of treated groundwater is limited to the same groundwater basin undergoing remediation. The discharges must not alter the hydrogeologic and geochemical characteristics of the basin outside the treatment zone. The injection of amendments, injection of treated groundwater, and disposal of treated groundwater must not increase the lateral or vertical extent of pollution or create a condition of pollution outside the treatment zone. The discharges must not exceed water quality objectives, both narrative and numeric, outside the defined treatment zone unless background concentrations of naturally occurring inorganic constituents and heavy metals are above the Basin Plan water quality objectives. Disposal of treated groundwater must be in a manner that controls runoff, does not cause erosion, scouring or flooding, and prevents offsite sediment deposition.

Dischargers must ensure the assimilative capacity of the groundwater basin is not unduly exhausted by the discharge and the discharge must be in compliance with any salt and nutrient management plan adopted for the groundwater basin. "Assimilative capacity" of a surface water or a groundwater is the ability of the water body to receive and accommodate natural and anthropogenic sources of pollutants (from point and nonpoint sources), while maintaining water quality standards that are protective of

beneficial uses of the water resource. Factors that affect the assimilative capacity of a groundwater basin depend on the pollutant, soil type, the groundwater chemistry, and hydraulic parameters.

The investigation derived waste, including soil and groundwater, must be containerized, properly labeled, characterized, removed from the site within 90 days of waste generation, and disposed of at an authorized disposal facility.

### **Monitoring and Reporting Program**

Pursuant to CWC section 13267, each enrollee is required to establish an MRP that includes the basic MRP requirements outlined under the Provisions of the Monitoring and Reporting Program and the specific requirements for each remediation type outlined in Attachment B of the proposed General Order and must be submitted as part of the RAP. The requirements are developed to monitor progress toward remedial objectives (cleanup goals) and includes post-treatment and closure monitoring requirements for both in-situ and ex-situ remediation. The specific MRP requirements outlined in the General Order address monitoring parameters for in-situ bioremediation, in-situ chemical oxidation, and ex-situ pump-and-treat remedial alternatives. The MRP will be approved and then issued with the NOA by the Executive Officer providing coverage under the General Order.

The technical reports required under the General Order that involve planning, investigation, evaluation, design, or other work requiring interpretation or application of engineering or geologic sciences, must be prepared by, or under the direction of, persons qualified to conduct this work and registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835 and 7835.1. To demonstrate compliance with CCR, title 16, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) such that all work can be clearly attributed to the professional(s) responsible for the work.

The Executive Officer is delegated the authority to amend the MRP that is required under the General Order.

### **Waste Discharge Prohibitions**

The prohibitions included in the General Order are designed to be protective of public health, water resources, aquatic life, and wildlife. Dischargers enrolled under the General Order are prohibited to cause degradation of the groundwater basin or violate the Basin Plan water quality standards outside the defined treatment zone, cause long-

term loss of assimilative capacity of the groundwater basin, cause a condition of pollution or nuisance, and to discharge waste classified as 'hazardous' under Section 2521, Chapter 15 of Title 23 or 'designated', as defined in CWC section 13173. The discharge of waste to ephemeral drainages that are perennial, discharge to wetlands and discharge to waters of the US are prohibited. Treated groundwater and amendments discharged to all authorized sites must not contain trace elements, pollutants or contaminants, or combinations thereof in concentrations that are toxic or harmful to humans or to aquatic or terrestrial plant or animal life.

The disposal of waste to property that is not an authorized part of the remediation project, disposal of treated groundwater in a manner that causes erosion, disposal of treated groundwater with concentrations of constituents of concern above cleanup goals, and overflows from the disposal system is prohibited.

For full details regarding the prohibitions of the General Order, see section V of the General Order.

### **Provisions of the General Order**

Applicants are required to submit a Notice of Intent (NOI) and RAP for approval by the Lahontan Water Board Executive Officer to determine if the project is eligible for enrollment under the General Order. The Executive Officer has the discretion to issue an NOA for enrollees whose projects meet the eligibility provisions of the General Order or to require individual WDRs for regulatory coverage on a site-by-site basis. Therefore, the Lahontan Water Board cannot speculate on how many activities may be enrolled in, constructed, or expanded as a result of the General Order, and is not required to determine the location or design of any facilities that may be constructed.

The Lahontan Water Board is authorized to initiate enforcement against the Discharger should the discharge of waste be in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in CWC section 13050.

The Discharger must comply with all conditions of the General Order and MRP. Any noncompliance with the General Order or MRP constitutes a violation of the CWC and is grounds for: 1) enforcement action; 2) termination, revocation and reissuance, or modification of the General Order; or 3) denial of the ROWD in application for new or revised WDRs.

The Discharger must obtain all other applicable local, state, and federal permits to construct and operate remediation systems and facilities necessary for compliance with this General Order and allow Lahontan Water Board staff to enter and inspect the facility.

The Discharger must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the General Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

Changes in discharge requires submittal of a revised NOI and RAP and payment of the annual fee. Changes in ownership requires a written notice and a copy of the written agreement be submitted to the Lahontan Water Board 30 days in advance of the change.

Waste discharges must conform to the CWC, the Basin Plan, and other applicable policies of the State Water Board and other regulatory agencies as applicable.

### **Lead Agency**

Under CEQA, the lead agency is the public agency with primary responsibility over the proposed project. The Lahontan Water Board is the lead agency under CEQA for this project.

### **Purpose of the Initial Study**

The purpose of this Initial Study (IS) is to evaluate the foreseeable potential environmental impacts that may occur as a result of groundwater remediation activities and adoption of the General Order. The IS has been prepared in accordance with Public Resources Code section 21000 (et seq.) and California Code of Regulations (CCR), title 14, section 15000 (et seq.). In accordance with the CEQA Guidelines, section 15064(a), an environmental impact report (EIR) must be prepared if there is substantial evidence (including the results of an IS) that a project may have a significant effect on the environment. A negative declaration or mitigated negative declaration may be prepared if the lead agency determines that the project would have no potentially significant impacts or that revisions made to the project mitigate the potentially significant impacts to a less than significant level.

### **Environmental Factors Potentially Affected**

None of the environmental factors listed on the attached environmental checklist, section III, would have a Potentially Significant Impact to the environment.

### **Determination**

On the basis of the evaluation of the environmental factors potentially affected, the Lahontan Water Board finds the proposed project will not have a significant effect on the environment and a draft NEGATIVE DECLARATION will be prepared for this project

pursuant to the provisions of CEQA.

## **Public Review and Comment**

As a discretionary action, issuance of the proposed General Order fits the CEQA definition of a project (Public Resources Code §21065 [c]). The Lahontan Water Board, as the project's lead agency, has consulted with state responsible and trustee agencies before deciding whether a project's impacts are significant (Public Resources Code §21080.3; CCR, Title 14, §15063) and prior to determining what type of CEQA document to prepare. The list of agencies consulted was developed with assistance from the California Office of Planning and Research. A copy of this IS/ND was transmitted on January 28, 2022 to all identified agencies.

This IS/ND will be available for a 30-day public review and comment period as described in the Notice. Written comments must be received during the comment period to be considered. If you have any questions about document availability or the public review and comment process, please contact Kerri O'Keefe at (530) 542-5473 or, [kerri.okeefe@waterboards.ca.gov](mailto:kerri.okeefe@waterboards.ca.gov).

## **II. PROJECT SETTING AND LOCATION**

The General Order is proposed to be applicable throughout the Lahontan Region. The Region is approximately 570 miles long with a total area of 39,210 square miles and is separated into north and south basins. The north basin extends from the Oregon border southward to Conway summit (just north of Mono Lake) and is generally bounded to the west by the Sierra Nevada mountains and the east by the Nevada state line. The south basin extends from Conway summit southward to the San Gabriel and San Bernardino Mountains and is generally bounded to the west by portions of the Sierra Nevada and Tehachapi Mountains, to the south by portions of the San Gabriel and San Bernardino Mountains, and to the east by the Nevada state line (Figure 1).

### **Regulatory Setting**

The Lahontan Water Board is one of nine Regional Water Quality Control Boards in California that operates under the authority of the State Water Resources Control Board (State Water Board). The State Water Board, together with the Department of Toxic Substance Control (DTSC), California Air Resources Board (CARB), Department of Resources Recycling and Recovery (CalRecycle), Office of Environmental Health Hazard Assessment (OEHHA), and Department of Pesticide Regulation (DPR), operate as regulatory agencies of the California Environmental Protection Agency (CalEPA). The departments of CalEPA are responsible for the restoration, protection, and enhancement of the environment to ensure public health, environmental quality, and



economic vitality. Many of the projects eligible for coverage under the General Order may be jointly regulated by such CalEPA departments and other state agencies.

The Lahontan Water Board specifically is responsible for the preservation, enhancement, restoration, and protection of water resources for beneficial uses. Various federal and state laws provide the Lahontan Water Board the authority to regulate waste discharges that have the potential to cause adverse impacts to water quality and beneficial uses.

These laws include the federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, and the Porter-Cologne Water Quality Control Act (CWC, Division 7).

### ***Federal Water Pollution Control Act (Clean Water Act)***

The federal Clean Water Act (CWA) was enacted to restore and maintain the chemical, physical, and biological integrity of waters of the United States (waters of the US) through the elimination of discharges of pollutants to surface water bodies. Under section 401 of the CWA, the Lahontan Water Board regulates discharges of dredge and fill material to waters of the State. Water of State is defined as any surface water or groundwater including saline waters, within the boundaries of the state. Waters of the state includes all waters of the US.

### ***Federal Safe Drinking Water Act***

The Safe Drinking Water Act (SDWA) is a federal law that provides protection of public water systems. The US Environmental Protection Agency (US EPA) sets national standards for drinking water to protect against health risks. In title 40, part 131.4, Code of Federal Regulations, and pursuant to section 510 of the CWA, the states are provided the authority to develop drinking water standards more stringent than the US EPA.

In response to the SDWA, the State of California adopted the Human Right to Water (AB 685), which establishes that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes (CWC, Division 1, section 106.3). The Office of Environmental Health Hazard Assessment (OEHHA), a partner agency within CalEPA, is responsible for performing major risk assessments and hazard evaluations on chemical contaminants in drinking water. These activities include developing Public Health Goals (PHG) for chemical substances in drinking water to identify the concentration of chemical contaminant in drinking water that does not pose a significant risk to human health.

Pursuant to the California Health and Safety Code §116365, the State Water Board adopts Primary Drinking Water Standards (Maximum Contaminant Levels [MCLs]) based on the PHGs established by the OEHHA. For waters designated with a Municipal (MUN) beneficial use, the Basin Plan (a regulation) establishes both primary and secondary MCLs as numerical water quality objectives in receiving surface waters and groundwater to protect their beneficial use of municipal and domestic supply.

***Porter-Cologne Water Quality Control Act (California Water Code, Division 7)<sup>4</sup>***

Article 3 of the CWC requires the nine Regional Water Boards to formulate and adopt water quality control plans for all areas within each region. The Lahontan Water Board adopted the Basin Plan in 1995, with subsequent amendments. The Basin Plan establishes beneficial uses and water quality objectives for surface water and groundwater and an implementation program for achieving the water quality objectives. The water quality standards are reviewed every three years.

Section 13260 of the CWC requires persons proposing to discharge potentially harmful constituents to waters of the State, to file a Report of Waste Discharge (ROWD) with the Lahontan Water Board. The ROWD must characterize the waste, indicate the method of discharge, and propose procedures to remain compliant with water quality objectives.

To obtain coverage under the General Order, a complete ROWD must be submitted to the Lahontan Water Board, pursuant to CWC section 13260(a)(1). A complete ROWD includes a complete NOI, a RAP, and the initial annual fee based upon the project type's TTWQ/CPLX. The NOI and required RAP information is provided in Attachment B of the General Order. The discharge of waste must not commence until an NOA from the Executive Officer that includes a site-specific monitoring and reporting program (MRP) and cleanup levels for the remediation project has been issued to the applicant.

CWC section 13263(i) authorizes the Lahontan Water Board to prescribe general WDRs for a category of discharges if the Lahontan Water Board determines the following criteria are met:

1. The discharges are produced by the same or similar operations.
2. The discharges involve the same or similar types of waste.
3. The discharges require the same or similar treatment standards.
4. The discharges are more appropriately regulated under general discharge requirements than individual discharge requirements.

CWC section 13267 authorizes the Lahontan Water Board to investigate the quality of

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<sup>4</sup> Lahontan Regional Water Quality Control Board, 1995, rev 2016.

the waters of the State by requiring anyone who proposes to discharge waste within the region to furnish technical monitoring reports. The unique MRP required for every enrollee under the General Order is established pursuant this criterion.

CWC section 13304 requires responsible parties in violation of any WDR or other order or prohibition issued by a Water Board, or who have caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be discharged into waters of the state and creates, or threatens to create, a condition of pollution or nuisance, upon order of the regional board, to clean up the waste or abate the effects of the waste.

Because the General Order only establishes requirements for waste discharge and does not establish requirements for groundwater remediation, nor establish groundwater cleanup levels, it does not address other cleanup requirements that may apply such as the State Water Board Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*.

### **State Water Resources Control Board Resolution 68-16**

In October 1968, the State Water Resources Control Board adopted Resolution 68-16 (State Antidegradation Policy) which incorporates the federal antidegradation policy. Under the State Antidegradation Policy, whenever the existing quality of water is better than that needed to protect all existing and probable future beneficial uses, the existing high quality shall be maintained until or unless it has been demonstrated to the State that any change in water quality will be consistent with the maximum benefit of the people of the State, and will not unreasonably affect present and probable future beneficial uses of such water. Any activity which proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

### **Geologic Environmental Setting<sup>5</sup>**

The Lahontan Region is a geologically complex portion of California. The land encompassed by the Lahontan Water Board boundaries has experienced all four types of plate boundaries beginning approximately 700 million years ago (Passive, Japanese, Andean, and Transform). The different types of plate boundaries created the rocks, minerals, mountains, soil and lakes that we see today.

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<sup>5</sup> Harden, 2004; Norris and Webb, 1990;

California has eleven different geomorphic provinces that were deposited and shaped by the four geologic processes. The geomorphic provinces included in the Lahontan Water Board jurisdictional boundaries include the Basin and Range, Cascade Range, Modoc Plateau, Mojave Desert, Sierra Nevada, and Transverse Ranges (Figure 2). The geomorphic provinces are each defined by topography and structure and contain significantly different rock formations, unique geologic features, hydrology, mineral resources, and soils.

### ***Basin and Range Geomorphic Province***

The Basin and Range province is the largest province within the Lahontan region and is found in the counties of eastern Modoc, northeastern and southern Lassen, eastern Mono, Inyo, northeastern Kern, and northern San Bernardino. It is the western most portion of the Great Basin, a much larger physiographic feature covering the greater portion of Nevada and smaller portions of Oregon, Idaho, Wyoming, and Utah. The northernmost portion of the province within the Lahontan region, encompasses the Surprise Valley area and further south, the Honey Lake area. The largest portion of the province encompasses the area east of the Sierra Nevada, mostly in Inyo County.

The major mountain ranges in the northern province include the Warner Mountains. The major mountain ranges in the southern province include the Argus Range, Black Mountains, Cottonwood Range, El Paso Mountains, Funeral Mountains, Grapevine Range, Inyo Mountains, Last Chance Range, Panamint Range, Slate Range, and the White Mountains. The major valleys include the Owens Valley, Panamint Valley, and Death Valley. The Basin and Range is most noted for the northwest trending mountain ranges, due to extensional faulting, with peaks up to approximately 14,500 feet above mean sea level (amsl), and valleys as low as 282 feet below mean sea level (bmsl). The major valleys are bounded by active normal faults.

### ***Cascade Range Geomorphic Province***

The portion of the Cascade Range geomorphic province within the jurisdiction of the Lahontan Water Board is in a small portion of southwestern corner of Lassen County. The major mountains of this province within the Lahontan Region boundaries include Campbell Mountain, Crater Lake Mountain, Little Harvey Mountain and Logan Mountain. The major valleys include Harvey Valley, Pine Creek Valley, and portions of Clover Valley. Major Lakes in the region include Feather Lake, Hog Flat Reservoir, Long Lake, McCoy Flat Reservoir, and Silver Lake. Major rivers and streams include Pine Creek and the Susan River. The portion of the Cascade Range geomorphic province within the Lahontan Region is characterized by low undulating hills with elevations averaging 4,000 feet amsl to 7,000 feet amsl.

### ***Modoc Plateau Geomorphic Province***

The portion of the Modoc Plateau geomorphic province within the Lahontan Water Board's jurisdiction is found in central Lassen County, border by the Basin and Range geomorphic province to the north and the south, and the Cascade Range geomorphic province to the west.

The Modoc Plateau is an undulating plateau averaging 4,000 feet amsl to 5,000 feet amsl. Major mountains include Horse Lake Mountain, Shaffer Mountain, and the Skedaddle Mountains. Major lakes include Eagle Lake and Horse Lake. Major valleys include Grasshopper Valley and the Madeline Plains.

### ***Mojave Desert Geomorphic Province***

The Mojave Desert geomorphic province encompasses the southernmost portion of the region and is located in the counties of eastern Kern, north eastern Los Angeles, and northern San Bernardino. The major mountain ranges include the Clark Mountains, Providence Mountains, Rodman Mountains, Ord Mountains, Soda Mountains, Rand Mountains, and Avawatz Mountains. Major valleys include Antelope Valley, Ivanpah Valley, and Mojave Valley. The valley bottoms range in elevation from 2,000 feet amsl to 4,000 feet amsl and mountains range between 3,500 feet amsl and 8,000 feet amsl, with the highest elevation found at Clark Mountain at 7,929 feet amsl. Drainage is to the interior. The Amargosa flows from Nevada to California, terminating in Death Valley.

### ***Sierra Nevada Geomorphic Province***

The Sierra Nevada geomorphic province is a northwest trending mountain range 400 miles long and up to 100 miles wide in some areas. The province encompasses the westernmost boundary of the region from eastern Kern County to southern Lassen County. Elevations in the province range from 400 feet amsl to 14,496 feet amsl at Mount Whitney, the highest point in California and the conterminous United States (US).

The Sierra Nevada mountains are largely composed of granitic rocks underlying deep marine and volcanic sediments. The overlying rocks were metamorphosed, which gave rise to the iconic mother lode gold belt, and these roof pendant rocks, combined with the Sierran granitics are the source of most sediments found in the Lahontan region.

### ***Transverse Ranges Geomorphic Province***

The Transverse Ranges geomorphic province is in the southern portion of the region. It extends along the western most portion of the region from northeastern Kern County to southwestern San Bernardino County. The province is a long narrow east-west trending series of mountain ranges. The province's major mountain ranges within the Lahontan

region include portions of the San Bernardino and San Gabriel mountains. These two mountain ranges lie along the San Andreas fault.

Major creeks and rivers include Deep Creek, Holcomb Creek, Grass Valley Creek, West Fork Mojave River and East Fork Mojave River; tributaries to the Mojave River, a water of the US located in the Mojave Desert geomorphic province. In the Antelope Valley, major drainage courses are Little Rock Wash, Big Rock Wash, Amargosa Creek, Cottonwood Creek, and Oak Creek. Cache Creek is the major drainage for the Fremont Valley.

### ***Metallic Mineral Resources***

The following metallic mineral resources are found within Lahontan Water Board boundaries.

***Copper.*** Minor copper deposits can be found in Alpine County and are recovered from the Pine Creek tungsten mine near Bishop in Inyo County.

***Gold and Silver.*** Minor amounts of silver have been found in Alpine County. Briggs Mine in Panamint Valley of Inyo County uses a cyanide leaching process to separate gold (primary commodity) and silver (secondary commodity) from ore that was mined until around 2015 and placed on a leach pad. Gold and silver ore is also recovered as a by-product of tungsten mining at the Pine Creek Tungsten Mine in Inyo County. Recoverable amounts of silver have been found in Randsburg in Kern County. The Blue Eagle Lode Mine in Kern County is an active gold mine that is extracting gold from the bottom of the existing open-pit and processed offsite. Gold and silver deposits were mined between 1909 and 1934 at the High Grade Mine in the Warner Range of Modoc County.

***Mercury.*** Minor amounts of mercury have been recovered north of Monitor (Loope) in Alpine County where cinnabar is in silicified breccia in andesite.

***Rare-earth Metals.*** Rare-earth minerals were discovered near Mountain Pass in northeastern San Bernardino County in April 1949. Open pit mining and exploration was conducted between the 1950's until approximately 1965. Rare-earth minerals were discovered near Mountain Pass in northeastern San Bernardino County in April 1949, and the following year the Sulphide Queen carbonate body was found. This body is the world's greatest known concentration of rare-earth metals with a tonnage larger than the total of all rare earths used in the world prior to 1950. The rare-earths in the Mountain Pass district are chiefly cerium, lanthanum, and neodymium. These elements occur principally in bastnaesite, a rare-earth fluorocarbonate which is found in very few localities throughout the world.

**Uranium.** Autunite and other secondary uranium minerals have been found northeast of Hallelujah Junction in Lassen County. The uranium minerals were found in lake beds that overlap granitic basement rock and are concentrated in and near woody and leafy organic material that is scattered in the lakebed.

**Tungsten.** Minor amounts of tungsten have been found in Alpine County, but Pine Creek Tungsten Mine located in Inyo County has yielded over 1.5 million units of tungsten trioxide.

### ***Nonmetallic Mineral Resources***

The following nonmetallic mineral resources are found within the Lahontan Water Board boundaries.

**Coal.** Thin seams of low-grade coal, and many weathered out fragments, occur in lake beds and volcanic sedimentary rocks of Modoc County, but not in commercial quality of quantity.

**Diatomite.** Diatomite is a sedimentary rock composed of fossilized skeletal remains of single cell aquatic algae known as “diatoms.” It is a unique form of silica that is crushed and used as a filter aid, absorbent, a filler in a variety of products including paints, an insulation material, a mild abrasive in polishes, and an additive in cement and other various compounds. Diatomite occurs in lakebed deposits in portions of Lassen County. The deposits are from a few feet thick to several hundred feet thick and relatively pure and potentially useful.

**Hot Springs (Geothermal).** A large number of hot springs are found throughout the region, related to the recency of volcanic eruptive activity and the abundance of faulting. Hot springs can be found in the northern and southern portion of the region. Geothermal power sources were explored in the Surprise Valley of Modoc County, but no development resulted. However, electrical energy is produced at the Coso geothermal area in Inyo County. In Coso, two separate hydrothermal circulation systems exist: 1) a deep geothermal reservoir; and 2) a shallow system where manifestations of the shallow geothermal reservoir exist in the form of fumaroles and hot springs.

**Perlite.** Perlite is a volcanic glass with high water content that expands when heated. It is used in building construction products, as a filler, as a horticulture aggregate, filter aid, and in cosmetics. Deposits of perlite, north of Honey Lake in Lassen County, were prospected and tested for lightweight aggregate in the late 1940s but no production has resulted.

**Pumice.** Pumice deposits can be found in Lassen County, north of Hallelujah Junction, but most of the production comes from areas outside the region.

**Salt.** At Koehn Lake in Kern County nearly pure salt is harvested directly. Brine pumped by windmills from shallow wells and ponds in lake sediments east of Middle Surprise Lake in Modoc County once yielded a small tonnage of crude salt by solar evaporation. The salt was used locally for stock feed in the early 1900's but processing the brine has been inactive in that area since 1925 and the reserve is almost completely gone. Since 1904, five plants have been constructed at Owens Lake for the manufacture of soda ash or sesquicarbonate and one plant the manufacture of caustic soda, but production of caustic soda was unsuccessful. All operations, with the exception of the US Borax plant north of Cartago, have ceased. More than 1,000,000 tons of alkali and about 30,000 tons of borax were produced during the operations of all the plants. Salt and associated gypsum occur in the northern foothills of the Avawatz Mountains in San Bernardino County. Borate minerals are mined in Kern County at the Boron Mine. The borate deposits are present in the form of tincal, kernite or rasorite, colemanite and ulexite. Production of borax at the Boron Mine is ongoing. Searles Valley Minerals in Trona processes brine solutions from Searles Lake to produce boric acid, sodium carbonate, sodium sulfate, several specialty forms of borax, and salts.

**Sand and Gravel.** The principal sources of sand and gravel are local stream alluvium in various areas including Surprise Valley in Modoc County, and Honey Lake Valley and in the Madeline Plains of Lassen County and is used in Portland cement concrete for road construction, curbs, gutters, bridges, etc. Large reserves of recent and Tertiary gravels are mined near Lake Tahoe.

**Stone, Crushed.** Decomposed granitic rock is quarried for road and fill purposes in Honey Lake Valley of Lassen County.

**Stone, Dimension.** In the 1800's and early 1900's, small tonnages of Tertiary tuffs and tuff breccias near Susanville in Lassen County were quarried for local use in a few public and commercial buildings. The quarry has not been active for several decades.

**Sulfur.** Recoverable amounts of sulfur have been recovered from the Leviathan Mine, an inactive open-pit sulfur mine in Alpine County.

**Volcanic Cinders.** Volcanic cinder quarry is located north of Eagle Lake in Lassen County. The main tonnage of volcanic cinders has been used for railroad ballast, road material fill, asphaltic concrete aggregate, and building blocks.



## **Zoned Active Faults with Recent Surface Rupture<sup>6</sup>**

California has been tectonically active since the Precambrian period, when the formation of California began, and tectonics continue to play a major role in the formation of the state. The Lahontan region has twenty-nine active faults zoned by the Alquist-Priolo Earthquake Fault Zoning Act (Act). Areas zoned by the Act are susceptible to surface rupture and ineligible for human habitation within fifty feet from the mapped fault trace. The following faults in the Lahontan region are areas zoned by the Act and have experienced surface rupture within the last two hundred years:

**Fort Sage Mountains Fault Zone.** The Fort Sage Mountains fault zone is a normal fault within the Walker Lane deformation belt located along the northwestern portion of the Fort Sage mountains in Lassen County. It is approximately 10.5 miles long with a slip rate of less than 0.2 millimeters per year (mm/yr). The most recent earthquake was a 5.6-magnitude in 1950.

**Garlock Fault Zone.** The Garlock fault zone is a 160-mile-long left-lateral fault zone running northeast-southwest along the northern Mojave Desert and the southern base of the Tehachapi mountains in Kern County. The Garlock fault is composed of three segments: The Central Garlock segment, the Eastern Garlock segment, and the Western Garlock segment. The Central Garlock segment is approximately 67 miles long with a slip rate that is greater than 5.0 mm/yr. The Eastern Garlock segment is approximately 37 miles long with a slip rate between 1.0 and 5.0 mm/yr. The Western Garlock segment is approximately 68 miles long with a slip rate greater than 5.0 mm/yr. In 1992, a 5.7-magnitude earthquake occurred, triggered by the Landers earthquake, and ongoing aseismic creep is noticeable along the Western Garlock segment.

**Hilton Creek Fault.** The Hilton Creek fault is a normal fault within the Sierra Nevada frontal fault zone located along the eastern side of the Sierra Nevada in Mono County. It is approximately 19 miles long with a slip rate between 1.0 and 5.0 mm/yr. The most recent earthquake includes a swarm of four (4) 6.0-magnitude earthquakes in 1980.

**Little Lake Fault Zone.** The Little Lake fault zone is a very active right-lateral fault zone within the Indian Wells Valley located north of Ridgecrest in Kern County. It is approximately 28 miles long with a slip rate between 1.0 and 5.0 mm/yr. The most recent earthquakes include two (2) large earthquakes, a 6.4-magnitude earthquake on July 4, 2019 and 7.1-magnitude on July 5, 2019. Rupture of the fault on July 5, 2019 identified a 30-mile segment that was previously unknown.

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<sup>6</sup> California Department of Conservation, 2020; Southern CA Earthquake Data Center, 2013; USGS Quaternary Fault and Fold Database, 2020.

**Manix Fault.** The Manix fault is another left-lateral fault approximately 22 miles long in the central Mojave Desert in San Bernardino County, east of Barstow. The slip rate is estimated to be 0.1 mm/yr. In 1947, the fault slipped leaving a small but notable surface rupture. This marked the first historic example of surface rupture along a fault in the Mojave Block.

**Owens Valley Fault Zone.** Located along the eastern side of the Sierra Nevada, the Owens Valley fault zone is composed of a right-lateral fault segment approximately 73 miles long, and a normal fault segment approximately 13 miles long. The slip rate is between 1.0 and 5.0 mm/yr for both segments. In 1872, a 7.6-magnitude earthquake occurred along the right-lateral segment that caused 62 miles of surface rupture.

**Pisgah-Bullion Fault Zone.** The Pisgah-Bullion fault is a right lateral fault approximately 90 miles long and is separated into four segments: the Bullion section, the East Bullion section, the Pisgah section, and the West Bullion section. The segment of the Pisgah-Bullion fault within the Lahontan region is the Pisgah section. This section of the fault is 20 miles long with a slip rate of between 0.2 mm and 1.0 mm/yr. The Landers earthquake in 1992 triggered slip along the Pisgah-Bullion fault.

**San Andreas Fault Zone.** The San Andreas fault zone is a right-lateral fault zone approximately 756 miles long. The segment of the San Andreas fault within the Lahontan region is known as the Mojave section and runs through San Bernardino and Los Angeles Counties. The slip rate along this section is greater than 5.0 mm/yr. The most recent significant earthquake along this section was the 1857 Fort Tejon earthquake near Wrightwood. This earthquake was one of the largest earthquakes ever recorded in the U.S., with a surface rupture over 225 miles. The average slip was 15 feet with a maximum displacement of 30 feet in the Carrizo Plain area (outside the Lahontan region). Recent seismological studies of this earthquake indicate a low angle thrust fault may have slipped simultaneously suggesting future movements along the San Andreas may produce catastrophic “double earthquakes”.

## Hydrologic Environmental Setting<sup>7</sup>

The Lahontan Region includes over 700 lakes, 3,170 miles of streams, and 19,710 square miles of groundwater basins. Consumptive municipal and agricultural use of water is relatively low in most parts of the Lahontan Region compared to other parts of California, due to the lower resident population compared to the rest of the state and the agricultural emphasis on range livestock grazing rather than for row crops and orchards. The dominant water use was historically agricultural pumping. However, increase in

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<sup>7</sup> California Department of Water Resources, 2003; State Water Resources Control Board, 2020.

urbanization throughout the region has increased the domestic use of groundwater supplies making it the current dominant use of groundwater in the Lahontan Region. Large volumes of water are exported for consumptive use outside the Lahontan Region. The waters of Truckee, Carson and Walker Rivers, and of Lake Tahoe, are allocated by court decisions, federal law, and interstate agreements among water users in California and Nevada. The City of Los Angeles Department of Water and Power diverts water from the Mono and Owens River Basins via the Los Angeles Aqueduct for use in the Los Angeles area. Some water is imported to the South Lahontan Basin via the State Water's Project California Aqueduct.

Careful consideration of the relationships between water quality and water quantity are important aspects of Regional Board planning activities. Reasons for concern include projected increases in population and consequent demands for water, and possible future water shortages due to drought, global climate change, and contamination of some water supplies by pollutants. There is increasing scientific and public awareness of environmental values associated with natural water volumes in streams, lakes, wetlands, and groundwater aquifers.

### ***Water Quality***

The natural quality of surface water at higher elevations, derived from snowmelt, is assumed to be very good or excellent, although localized problems related to heavy metals and radioactive elements occur. The soils and waters of the Sierra Nevada have low buffering capacity for acids, and its lakes and streams are considered sensitive to acidification as a result of wet and dry deposition of pollutants from urban areas. Although high quality water supplies are available near streams in desert areas of the Lahontan Region, many desert areas have naturally poor quality (e.g., high concentrations of arsenic, fluoride, selenium and/or salts).

Threats to beneficial uses from naturally high concentrations of salts and metallic minerals can be aggravated by geothermal and agricultural discharges, groundwater overdraft which concentrates salts, and disposal of stormwater under conditions where it is likely to receive adequate treatment by soils and vegetation.

Water quality problems in the Lahontan Region are largely related to erosion from construction, timber harvesting, livestock grazing, stormwater, wastewater disposal systems, leaking petroleum underground storage tank systems, leachate from unlined landfills, acid drainage from inactive mines, and use of solvents at Department of Defense sites and dry cleaners.

## ***Surface Water Hydrology***

There are forty major watersheds (called “hydrologic units” under the Department of Water Resources mapping system). Although the majority of surface water runoff from the mountains drains to the interior of the province today (does not empty to the Pacific Ocean), parts of the region probably had external drainage during prehistoric times. Most of the basins have been produced by block faulting, and interior drainage resulted because rain and snowfall produce less water than is lost by evaporation. Lakes in the Basin and Range geomorphic province lose an estimated 2 to 2.5 meters (7-8 feet) to evaporation annually. When the water is not replaced, the lakes become dry lakes or playas.

The drainages that transport the snowmelt and precipitation to these dry lakes are generally ephemeral in nature. Recent research indicates ephemeral drainages are areas where significant groundwater recharge may occur in arid and semi-arid environments and can occur during summer and winter months. Although the majority of streams within the Lahontan Region are ephemeral, there are a few perennial streams located in the southern and northern portions of the region.

The most prominent stream in the southern Lahontan Region is the Owens River, owing its existence to the Sierra Nevada. Most of the water to the Owens River is diverted by Los Angeles Department of Water and Power (LADWP); however, unusually heavy runoff from the Sierra Nevada may fill the Owens basin but the lake disappears during dry years. To preserve native wildlife and implement dust management control measures within the Owens Lake, due to the diversion of water from the Owens River, LADWP allows minor discharges to the lake on a routine basis. Although most of the lakes are ephemeral, holding water only after heavy rain, there are a few permanent lakes in the Lahontan Region such as Mono Lake. Mono Lake, the most notable permanent lake without an outlet, and is also fed by streams from the Sierra Nevada.

**Mono Lake**<sup>8</sup>. Mono Lake is a terminal lake within the Basin and Range geomorphic province and is designated an Outstanding National Resource Water (ONRW). Pursuant to the federal Clean Water Act, no permanent or long-term reduction in water quality is allowable for an ONRW. Mono Lake was designated an ONRW due to its unique water quality (high alkalinity and high salt content) that supports important ecosystems.

Mono Lake is a remnant of an old Pleistocene lake, Lake Russel. Several times during the past 3 million years, Lake Russel had an outlet, first to the north into the Walker River system and later to the south Adobe Valley and Owens River system. As the

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<sup>8</sup> Lahontan Regional Water Quality Control Board, 1995, rev 2016.

climate got warmer and drier, the lake level fell and since about 80,000 years ago water no longer reached the outlet resulting in a closed basin and forming the present Mono Lake.

Mono Lake is fed by Sierra Nevada snowmelt and calcium rich spring water. Because the only way water leaves the lake is through evaporation, this causes a buildup of salts. The calcium rich spring water and alkaline lake water, containing an abundance of carbonate, mixes and crystallizes into the mineral calcite ( $\text{CaCO}_3$ ) forming the large tufa towers that are visible within and around the lake. The exposed tufa towers mark the level of the Pleistocene Lake Russell.

Surface water hydrology is notably different in the northern portion of the region. There are several permanent lakes and perennial streams, creeks and rivers. The most prominent permanent lake within the northern region is Lake Tahoe. The lake has one outlet, the Truckee River, and is fed by several streams, creeks and rivers originating from the Sierra Nevada as well as other mountains surrounding the lake.

**Lake Tahoe**<sup>9</sup>. Within the Sierra Nevada geomorphic province is Lake Tahoe. Lake Tahoe is a designated Outstanding National Resource Water (ONRW), renowned for its extraordinary clarity, purity, and deep blue color. Elevations of the lake basin range from 6,225 feet at lake level to 10,891 feet at Freel Peak. Over millions of years, the area records periods of marine deposition, granitic intrusion, tectonic uplift, volcanic eruptions, glaciation, and erosion.

Section 114 of the CWA indicates the need to “preserve the fragile ecology of Lake Tahoe.” No permanent or long-term reduction in water quality is allowable in areas given special protection as ONRW. In response, additional water quality objectives above those that are already established for general surface waters, were added to the Basin Plan for the Lake Tahoe Hydrologic Unit. These additional water quality objectives include algal growth potential, biological indicators, clarity, electrical conductivity, pH, plankton counts, suspended sediment, and transparency.

### ***Groundwater Hydrology***

Precipitation that infiltrates into the ground may be stored in the spaces within sediments and rocks beneath the earth’s surface. This stored water is groundwater, and it is an important part of California’s water supply. As water seeps into the ground, some of it is held by the soil near the surface in the unsaturated zone. This zone may be dry during periods when evaporation and transpiration are greater than infiltration. Beneath the unsaturated zone, groundwater fills all available spaces in the rock or sediment in

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<sup>9</sup> Lahontan Regional Water Quality Control Board, 1995; rev 2016; Saucedo, G.J., 2005

the zone of saturation. The boundary between the unsaturated and saturated zone is the water table. The water table marks the depth at which one encounters saturated materials while digging a hole or drilling a well. The water table fluctuates drastically throughout the Lahontan Region. Groundwater is found at earth's surface in river valleys or at springs at various locations and can be found at depths greater than 250 ft bgs. The position of the water table changes seasonally, rising as the groundwater is recharged with infiltrated precipitation and falling during dry periods and periods of over pumping. During prolonged droughts in California, drops in the water table of tens of feet have been recorded. Groundwater is a critical resource in California that must be preserved and protected. Groundwater is considered a critical resource because it is used for municipal, domestic, and agricultural supply to many residents on a daily basis and also provides a vital role in maintaining environmental sustainability during times of drought.

### ***Assimilative Capacity of a Groundwater Basin***

In general terms Assimilative Capacity of a surface water or a groundwater is the ability of the water body to receive and accommodate natural and anthropogenic sources of pollutants (from point and nonpoint sources), while maintaining water quality standards that are protective of beneficial uses of the water resource. In practical terms, Assimilative Capacity is estimated as the difference between the water quality objectives and the existing groundwater quality for each basin/subarea as described in Section 4 of the Basin Plan. The General Order prohibits long-term loss of the assimilative capacity of the groundwater basin from the proposed remedial activities.

### ***Salt and Nutrient Management Plans***

The State Water Resources Control Board adopted the Recycled Water Policy (Policy) on February 3, 2009. The Policy requires development of salt and nutrient management plans (SNMP) for each basin and subbasin in the region to achieve long term water quality objectives where salts and nutrients are a threat to water quality. Past analyses of various amendments, including corn syrup, molasses, HRC™, and edible oils have shown elevated concentrations of sodium and other salts. The General Order requires that discharges associated with remedial activities within a basin or subbasin that has an accepted SNMP be consistent with that SNMP. A Salt and Nutrient Management and Protection Plan is required to be submitted with the RAP to determine applicability for enrollment under the General Order.

Eighteen (18) groundwater basins have been identified in the Lahontan Region that require a salt and nutrient management plan. Five (5) groundwater basins and one (1) groundwater subbasin currently have SNMPs that have been accepted by the Lahontan Water Board. The accepted SNMPs include: the Antelope Valley (6-44), Bicycle Valley

(6-25), Fremont Valley (6-46), Indian Wells Valley (6-54), Langford Valley (6-36), and the Tehachapi Valley (6-45) groundwater basins; and the Irwin subbasin of the Langford Valley (6-36.02). Details regarding the accepted [SNMP within the Lahontan Region](#) can be found on the [Lahontan Water Board](#) internet website.

### ***Sustainable Groundwater Management Act***

On September 16, 2014, a three-bill legislative package, composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), was signed into law. The three-bill package is known as the Sustainable Groundwater Management Act (SGMA). SGMA provided the framework for sustainable groundwater management requiring governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. The General Order has been developed to comply with the SGMA and work cooperatively with the Department of Water Resources (DWR) and other water agencies.

In response to SGMA and basin prioritization, hydrologists have divided California into ten hydrologic regions. The nine Regional Water Boards are defined (for the most part) by the boundaries of these hydrologic regions, as described in CWC section 13200. The hydrologic regions within Lahontan boundaries are the North Lahontan Hydrologic Region and the South Lahontan Hydrologic Region. These two hydrologic regions are further divided into several groundwater basins and subbasins (Figures 3 and 4).

Groundwater pumping has contributed to declining groundwater tables in many aquifers. Under SGMA, adjudicated groundwater basins are subjected to separate reporting. Adjudicated groundwater basins in the Lahontan Region are the Inyo/Owens Valley Groundwater Basin, Mojave Groundwater Basin and Antelope Groundwater Basin.

### ***North Lahontan Hydrologic Subregion***

Groundwater in the northern half of the North Lahontan Hydrologic Subregion is primarily contained in basin-fill and volcanic rock aquifers, with some fractured hard rock zones. The southern half of this region is dominated by fractured hard rock zones, but small segments of basin-fill aquifers also exist in this part of the subregion. In general, the water quality in the North Lahontan Hydrologic Subregion is good. In basins in the northern portion of the region, groundwater quality is widely variable. The groundwater quality along these basin margins tends to be of higher quality, but the potential for future groundwater pollution exists as urbanization increases, especially in hard rock areas. Groundwater quality in the alpine basin ranges from good to excellent (Figure 3).

### ***High and Medium Priority Basins in the North Lahontan Hydrologic Subregion***

Tahoe Valley South groundwater subbasin (DWR Basin Number 6-005.01) is listed as a medium-priority basin. In compliance with SGMA, groundwater sustainability agencies (GSAs) are required to develop and implement a groundwater sustainability plan (GSP) for the basin by January 31, 2022.

All other groundwater basins in the North Lahontan Hydrologic Subregion are listed as low- or very-low priority. These groundwater basins are not subject to SGMA, but local public agencies are encouraged to form GSAs and develop GSPs for long-term groundwater resource sustainability.

### ***South Lahontan Hydrologic Subregion***

The South Lahontan Hydrologic Subregion is bounded on the west by the crest of the Sierra Nevada, on the north by the watershed divide between Mono Lake and East Walker River drainages, on the east by the Nevada state line, and on the south by the crest of the San Gabriel and San Bernardino mountains and the divide between watersheds draining south toward the Colorado River and those draining northward. The subregion includes all of Inyo County and parts of Mono, San Bernardino, Kern, and Los Angeles Counties (Figure 4).

The South Lahontan Hydrologic Subregion contains numerous basin-fill aquifers, separated by fractured hard rock zones. Although the quantity of surface water is limited in the South Lahontan Hydrologic Subregion, the quality is very good, being greatly influenced by snowmelt from the eastern Sierra Nevada. However, at lower elevations, groundwater and surface water quality can be degraded, both naturally from geothermal activity, and because of human-induced activities. Drinking water standards are most often exceeded for total dissolved solids (TDS), fluoride, arsenic and boron content. Groundwater near the edges of valleys generally contains lower TDS content than water beneath the central part of the valleys or near dry lakes.

### ***High and Medium Priority Basins in the South Lahontan Hydrologic Subregion***

Indian Wells Valley groundwater basin (DWR Basin Number 6-054) is identified as a high priority critically overdrafted basin. In compliance with SGMA, the Indian Wells Valley Groundwater Authority (GSA) submitted the GSP for the Indian Wells groundwater basin to DWR on January 31, 2020. The GSP identifies impacts to the beneficial uses and users due to reduction in groundwater storage, increased lowering of groundwater levels, degraded groundwater quality and land subsidence. In response, several management actions are proposed to reduce the negative impacts while preserving the quality of life for the residents of the Indian Wells Valley groundwater



basin. A copy of the GSP can be found online at: <https://sgma.water.ca.gov/portal/>.

Within the boundaries of the Indian Wells Valley groundwater basin, the Lahontan Water Board regulates discharges from land disposal sites, wastewater treatment plants, wastewater reclamation sites, Department of Defense operations, and cannabis growing operations. Active facilities currently under WDRs within Lahontan Water Board jurisdiction include Oro LTD Mine and Mill, Ridgecrest/Inyokern Landfill, Inyokern Community Services District Wastewater Treatment Facility, Ridgecrest Wastewater Treatment Facility, Ridgecrest Reclamation Irrigation Site, China Lake Naval Air Weapons Station, and Chief Farms LLC. All relevant case files associated with each facility are available on the State Water Board GeoTracker database (GeoTracker). GeoTracker is accessible online at: <https://geotracker.waterboards.ca.gov/>.

### ***Precipitation***

Most of the Lahontan region receives less than 30 inches precipitation annually except for the Sierra Nevada mountain range. As shown in Figure 5, the Sierra Nevada experiences on average 25 to 80 inches annually, concentrated around Alpine, El Dorado, Placer, and Mono Counties. Much of the climatic variation in the region results from the patterns of global weather systems, oceanic influences, the location and orientation of the mountains, and the jet stream typically brings the weather from west to east. Specifically, the Sierra Nevada range causes orographic uplift of the weather that comes from the west, resulting in increased precipitation on the mountains. As the jet stream takes the weather pattern eastward over the mountains there is a rain shadow effect from the Sierra Nevada which dramatically decreases the precipitation eastward. This is evident especially in the Owens Valley and Death Valley areas.

On average, about 75 percent of the annual precipitation in the region falls between November and March; with about 50 percent occurring between December and February. However, amounts of precipitation vary greatly from year to year, which can often make surface water supplies and groundwater recharge highly variable.

### **Biological Environmental Setting<sup>10</sup>**

The Lahontan region is rich in natural biological diversity due to the varying climate, topography, precipitation, and soils. The region is divided into 3 different bioregions by the US Department of Agriculture-Forest Service (USDA): Modoc, Mojave Desert, and Sierra. To manage environmental problems and natural resources, the US Environmental Protection Agency (USEPA) and the United States Geological Survey

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<sup>10</sup> Bailey, R.G., 1995; CA Dept of Fish and Wildlife, 2020; CA Dept of Forestry, 2019; McNab, W.H. and Avers, P.E., 1996; US EPA, 2020; USGS, 2020.

(USGS) adopted the delineation of these bioregions. The biodiversity of the flora, fauna, and ecosystems in each bioregion tend to be distinct from that of others. It is accepted the biological communities do not exist in isolation, but rather interact with one another so that the use of one will affect another.

The Lahontan region houses seventy-five (75) different state and/or federal listed threatened and endangered species, including amphibians, birds, crustaceans, dicots, fish, insects, mammals, monocots, and reptiles (Appendix B). Threats to these species vary, but urbanization and drought are key factors to the decline of many species and ecosystems. Other factors include grazing, deforestation, off road vehicle use, introduction of non-native species, water diversion, groundwater overdraft, and unauthorized discharges of contaminants to soil and water.

The protection of these species is the responsibility of federal, state, and local governments. The Lahontan Water Board, as a responsible agency for the protection of human health and the environment, works cooperatively with all agencies to protect valuable biological resources and implement conservation and management plans.

### **III. CEQA ENVIRONMENTAL CHECKLIST**

The CEQA Environmental Checklist (Checklist) is a series of questions grouped by subject that identifies different types of potential environmental impacts that a project may cause. CEQA considers what are the existing conditions of the physical project site as a baseline. It then compares how much change will occur to the environment if the project is implemented. Based on the CEQA Guidelines, the impact severity is rated on a scale of four impact levels. The four levels are: potentially significant impact, less than significant with mitigation incorporated, less than significant impact, or no impact.

The Lahontan Water Board prepared the IS and Checklist to evaluate reasonably foreseeable environmental impacts and determine if a significant impact to the environment is likely with the adoption of the General Order. The baseline physical conditions by which a lead agency determines whether an impact is significant are the existing physical conditions in the vicinity of the project at the time the CEQA document is being prepared. Adoption of the General Order is for regionwide application and does not address site-specific impacts. The Lahontan Water Board has the discretion whether to use the General Order or require individual WDRs for regulatory coverage on a site-by-site basis. The Lahontan Water Board cannot speculate on how many remediation activities may be enrolled in, constructed, or expanded as a result of General Order, and is not able to determine the location or design of any remediation activity.

Pursuant to CCR, title 14, section 15064(d), a change which is speculative or unlikely to

occur is not reasonably foreseeable and should not be considered in the environmental analysis. As such, this analysis is limited to the general effects associated with the eligible remediation activities. This Initial Study was prepared based upon typical in-situ and ex-situ systems. Since it is speculative to estimate the type, size, and location of any remediation activity, this evaluation makes no attempt to quantify the impacts from the construction and operation of expanded or new remediation system. The Regional Water Board also does not specify the methods in which dischargers can choose to comply with the General Order. Thus, the level of analysis is of a general nature and is commensurate with that level of detail.

The evaluation considers potential environmental impacts that may result from in-situ and ex-situ remediation activities including: 1) construction and operation of remediation systems; 2) injection of amendments to the vadose zone and groundwater basin; 3) discharges of the waste to land; 4) direct reinjection of waste; 4) impacts from monitoring activities, and 5) handling and off-site disposal of investigation derived waste.

The General Order contains requirements that protect water quality and the impacts from the project are expected to be “No Impact”, “Less Than Significant Impact”, and “Less Than Significant with Mitigation.” The Lahontan Water Board cannot speculate on how many facilities or remediation sites would be covered as a result of adoption of the General Order and is not able to determine the location or design of any facilities.

For the environmental analysis of the checklist, any conditions and/or requirements of the General Order are considered project design features and are not evaluated as mitigation measures. The General Order does not alter or supersede any regulations of other agencies but will provide more stringent regulation than is currently in place at the regionwide level.

## **1. Aesthetics**

The level of impacts to aesthetics are evaluated based on the following questions posed under impact description in the matrix below, except as provided in Public Resources Code section 21099. Will the project:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Have a substantial adverse effect on a scenic vista?	No	No	Yes	No
B	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	No	No	Yes	No
C	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	No	No	Yes	No
D	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	No	No	Yes	No

### Discussion of Impact Assessment

- 1A. Except as provided in Public Resources Code Section 21099, would the project have a substantial adverse effect on a scenic vista?

**Less than significant impact.** Remediation activities that are eligible for coverage under the General Order have the potential to be situated within areas that offer scenic resources. In-situ and ex-situ remediation design may include construction of temporary structures to house remediation equipment and materials, construction of above ground remediation infrastructure, security lighting, fencing and roads. Though the General Order requires applicants to comply with the local regulations and the impacts are expected to be temporary and the structures and other project-related infrastructure must be removed when remediation is complete. Local scenic quality ordinances must be complied with and could include reduced building size and compatible architectural design and color. The impact to aesthetics is

less than significant.

- 1B. Except as provided in Public Resources Code section 21099, would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

**Less than significant impact.** In-situ and ex-situ remediation activities issued coverage under the General Order are not anticipated to impact scenic resources; however, any impacts would be temporary and short-term. Applicants are required to comply with federal, state, and local regulations.

- 1C. Except as provided in Public Resources Code section 21099, would the project in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

**Less than significant impact.** Project applicants will be required to ensure impacts are reduced to a less than significant level by complying with local scenic quality requirements. Remediation sites situated in urbanized areas would not conflict with any applicable zoning or any other regulation governing scenic quality. Remediation activities may include construction of temporary structures to house remediation equipment and materials, construction of above ground remediation infrastructure, security lighting, fencing and roads. Periodically, crews will visit remediation facilities for operation and maintenance and to conduct monitoring. The impacts are expected to be temporary and the structures and other project-related infrastructure removed when remediation is complete.

- 1D. Except as provided in Public Resources Code section 21099, would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

**Less than significant impact.** In the event additional lighting is required as part of the operation and maintenance of the in-situ and ex-situ remediation systems, project applicants will be required to ensure the lighting is directed downward and does not cause substantial light or glare which would adversely affect day or nighttime views.

## 2. Agriculture and Forestry Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

The level of impacts to agriculture and forestry resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	No	No	No	Yes
B	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	No	No	No	Yes
C	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	No	No	No	Yes

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
D	Result in the loss of forest land or conversion of forest land to non-forest use?	No	No	No	Yes
E	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	No	No	No	Yes

**Discussion of Impact Assessment**

2A. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

**No impact.** The Farmland Mapping and Monitoring Program provides detailed maps of information related to soil candidate listing for Prime Farmland and Farmland of Statewide Importance, summary of the acreage of each type of the agricultural land use category, and the total acreage converted to another use for each County statewide. According to the map, Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are in the counties of Kern, Los Angeles, Modoc, San Bernardino, and Sierra.

Coverage under the General Order will not be for the purpose of converting agricultural lands to non-agricultural use. Although the use of fertilizers, herbicides and pesticides has contributed to groundwater contamination, which may require permitting to remediate under the General Order, the in-situ and ex-situ remediation activities covered under the General Order will not convert Farmland to non-agricultural use because the project is intended for the completely unrelated purpose of cleaning up contamination.

2B. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

**No impact.** In-situ and ex-situ remediation activities covered under the General Order will not conflict with any zoning ordinances or the Williamson Act contract.

- 2C. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

**No impact.** In-situ and ex-situ remediation activities covered under the General Order are not anticipated to conflict with existing zoning ordinances or necessitate the rezoning of forest lands.

- 2D. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

**No impact.** In-situ and ex-situ remediation activities that are eligible for coverage under the General Order will not result in the loss of forest land or convert forest land to non-forest use because the project is intended for the completely unrelated purpose of cleaning up contamination. Adopting the General Order does not change zoning or land use designation and will not alter the economics of forest land conversion to other uses.

- 2E. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

**No impact.** Agriculture and forest resources are important in many parts of the Lahontan region. Adoption of the General Order and the in-situ and ex-situ remediation activities eligible for coverage would not convert farmland to non-agricultural use or conflict with any zoning laws or result in loss of forest lands. The General Order allows use of the treated groundwater (waste) for irrigation purposes. The treated groundwater must be returned to the same groundwater basin from which it was extracted. The discharge of groundwater with detectable concentrations of man-made organic compounds is prohibited.

Chapter 4 of the Basin Plan outlines the regulatory authority of the Lahontan Water Board to implement water quality objectives and provisions that protect agricultural and forest beneficial uses. Agricultural uses include ranching, dairying, aquaculture (the cultivation of aquatic plants and animals for food), and crop (vegetable, fruit, nut, and legume) production. The Lahontan region



encompasses at least part of nine National Forests and ten designated wilderness areas within the national forests.

### 3. Air Quality

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. The level of impacts to air quality are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Conflict with or obstruct implementation of the applicable air quality plan?	No	No	Yes	No
B	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality?	No	No	Yes	No
C	Expose sensitive receptors to substantial pollutant concentrations?	No	No	Yes	No
D	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	No	No	Yes	No

#### Discussion of Impact Assessment

- 3A. Would the project conflict with or obstruct implementation of the applicable air quality plan?

**Less than significant.** In-situ and ex-situ remediation activities are not anticipated to conflict with any applicable air quality plan, because remediation of contaminated soil and groundwater is not expected to significantly increase aerial emissions of contaminants. In-situ and ex-situ remediation activities could lead to an increase in air emissions from vehicles coming to and from the site during construction and operation of the remediation system. The impacts are expected to be temporary and the structures and other project-related infrastructure must be removed when remediation is completed. All remediation equipment which generates aerial

emission (such as air stripping towers and petroleum powered generators) are required to comply with local, state, and federal air quality standards.

- 3B. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?

**Less than significant impact.** In-situ and ex-situ remediation is not anticipated to result in a cumulative net increase of any criteria pollutants because the activities are expected to be temporary and short-term in duration and limited in number. Remediation activities could lead to an increase in air emissions from vehicles coming to and from the site during construction and operation of the remediation system. However, the impacts are expected to be temporary and the structures and other project-related infrastructure removed when remediation is completed. Also, every project must comply with local, state, and federal air quality emission standards for remediation equipment that generates emissions.

- 3C. Would the project expose sensitive receptors to substantial pollutant concentrations?

**Less than significant impact.** Though the project may involve handling hazardous concentrations of contaminants or amendments for the remediation, the project must comply with all federal, state and local public health requirements and air quality emission standards. Therefore, it is not expected the project will expose sensitive receptors to substantial pollutant concentrations.

- 3D. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

**Less than significant impact.** In-situ and ex-situ remediation activities may have the potential to emit odors that are less than satisfactory during soil excavation activities. Short-term increases in heavy equipment used during construction and installation of remedial equipment and short-term increases in vehicular traffic, caused by ongoing operation and maintenance of the remediation systems, are a less than significant source of vehicle emissions (sulfur dioxide, ammonia, nitrogen dioxide, and carbon dioxide) and emission factors will vary depending on the size and location of the project. Emissions may be a factor when assessing ambient air quality.

Some remedial devices, equipment, or materials (i.e., pumps, above ground

gasoline and diesel storage fuel tanks, chemicals, and contaminated soil) also have the potential to be a source of objectionable odors. This impact is anticipated to be short-term for most sites. Also, excavation of soils contaminated with solvents and fuel may present objectionable odors to site workers and neighboring communities.

#### 4. Biological Resources

The level of impacts to biological resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	No	No	Yes	No
B	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	No	No	Yes	No
C	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	No	No	Yes	No
D	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
E	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No	No	No	Yes
F	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No	No	Yes	No

### Discussion of Impact Assessment

- 4A. Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

**Less than significant impact.** There are seventy-five (75) federal or California threatened or endangered species that are listed in the Lahontan Region (Appendix B). Grading, vehicular use, installation of structures and impervious surfaces, operation and maintenance of the remediation equipment and disposal systems, and discharges of treated groundwater to land and to ephemeral drainages has the potential to impact these species depending on the location.

The proposed General Order requires each applicant to include a Sensitive Receptor Survey and Protection Plan that identifies the biological resources and surface waters (including waters of the State and water of the US) located onsite and within one (1) mile of the remediation project. Applicants that propose to discharge to an ephemeral drainage must identify the best management practices that will be implemented to prevent scouring, erosion, and sediment transport downstream. Some restrictions on discharges during storm events will apply.

Enrollees are also required to submit and implement an Operation and Maintenance Plan and a Site Restoration Plan for the remediation site. The

plans must identify the actions taken to maintain the site conditions during remediation activities in a manner that is protective of wildlife (and human life), does not contribute to a condition of pollution, preserves natural site conditions to the maximum amount practicable, and restores natural areas of impact to the maximum extent practicable after the remediation site is closed. The plan may need to be updated periodically as the remediation process continues and prior to site closure.

Because the exact locations of the remediation activities are unknown, studies to evaluate the value and quantity of biological resources that might be impacted by the remediation project will need to be conducted by the applicant. If there is the potential to have a substantial adverse effect on species identified as a candidate, sensitive, or special status species (protected species) in local or regional plans, policies, or regulation, or by the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFW), coordination will be recommended with the applicable agency to avoid impacts prior to qualifying for the General Order.

- 4B Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

**Less than significant impact.** Healthy, vegetated riparian habitat is essential to the natural ecological functioning of associated rivers and streams throughout the Lahontan Region. To preserve and protect riparian habitat and sensitive natural communities, applicants of the General Order are required to submit a Stormwater Management Plan with the NOI and RAP.. In The General Order prohibits discharges of wastes in a manner that causes offsite sediment deposition, runoff or erosion. Adequate stormwater facilities must be incorporated into the remediation system design to divert stormwater from the application area, treatment system, and waste storage areas, to protect against washout, inundation, structural damage or significant reduction in efficiency resulting from the maximum historic rain event. See also response #4a (above).

- 4C. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

**Less than significant impact.** Discharges to perennial and intermittent

waters of the State including wetlands and discharges to waters of the US are prohibited by the General Order. Therefore, the discharges are unlikely to have a substantial adverse effect on state or federally protected wetlands.

- 4D. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

**Less than significant impact.** In-situ and ex-situ remediation activities covered under the General Order requires compliance with all local, state and federal laws, ordinances, and regulations that protect biological resources. If barriers to travel corridors cannot be avoided, provisions for new protected travel corridors may need to be incorporated into the project design.

Any above ground components including remediation equipment housing structures, fencing and waste containment structures are typically small in size and can be placed in areas that will not impede the movement of species.

Discharges to ephemeral drainages are not anticipated to impede the movement of any species. The volume of treated groundwater discharged to the ephemeral drainages will be restricted during rain events to maintain the natural flow of the surface water and protect against impedance upon wildlife and the environment.

- 4E. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

**No impact.** The proposed General Order requires compliance with all local, state and federal laws, ordinances, and regulations that protect biological resources.

- 4F. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

**Less than significant.** The proposed General Order will not conflict with any adopted state habitat conservation plan. See responses above).

## 5. Cultural Resources

The level of impacts to cultural resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project

will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	No	No	No	Yes
B	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	No	No	No	Yes
C	Disturb any human remains, including those interred outside of formal cemeteries?	No	No	Yes	No

### Discussion of Impact Assessment

- 5A. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

**No impact.** Historical resources, as defined in §15064.5, are not anticipated to be changed or impacted by the proposed General Order. Section II.A of the proposed General Order requires applicants to submit a Remedial Action Plan including a Sensitive Receptor Survey and Protection Plan to identify potential impacts to cultural resources. If potential impacts are identified, then the applicant must revise the design to avoid impacts.

- 5B. Would the project cause a substantial adverse change in the significance of an archaeological resources pursuant to §15064.5?

**No impact.** The significance of archaeological resources, as defined in §15064.5 and Public Resources Code section 21083.2, are not anticipated to be changed or impacted by the proposed General Order. Section II.A of the proposed General Order requires applicants to submit a RAP including a Sensitive Receptor Survey and Protection Plan to identify and mitigate impacts to cultural resources. Projects eligible for coverage under the General Order are not authorized to demolish, destroy, relocate, or alter any historical resource such that the significance of the historical resource would be materially impaired, or a unique archeological resource as defined in Section 21083.2 of the Public Resources Code.

5C. Disturb any human remains, including those interred outside of formal cemeteries?

**Less than significant.** Should previously unknown/undocumented human remains or artifacts be discovered, project proponents will be required to halt excavation activities and contact the coroner of the county. Upon discovery of human remains, project proponents will need to comply with Health and Safety Code section 7050.5 and Public Resources Code section 5097.98. The following actions will be taken immediately upon the discovery of human remains:

Work in the vicinity of the discovery will stop immediately and the county coroner will immediately be notified. The coroner has two working days to examine human remains after being notified by the responsible person. If the remains are Native American, the coroner has 24-hours to notify the Native American Heritage Commission. The Native American Heritage Commission will immediately notify the person it believes to be the most likely descendent of the deceased Native American. The most likely descendent has 48-hours of being granted access to the site to make recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the human remains and any associated grave goods.

## 6. Energy

The level of impacts to energy are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	No	No	Yes	No
B	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	No	No	No	Yes



## Discussion of Impact Assessment

- 6A. Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

**Less than significant.** Energy consumption during operation of remedial equipment including security lighting is not expected to impact available resources because energy requirements are typically low for the remediation equipment operation and are expected to be temporary and short-term in duration. Project applicants may site, orient, and design the remediation area to reduce energy consumption and promote clean, renewable energy use. Design may include the installation of photovoltaic panels and energy efficient pumps and lighting. Operation may be reduced during times of peak energy use to reduce demand on the system. Emergency generators may need to be used to continue operation during times of utility shutoff.

- 6B. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

**No impact.** The proposed General Order is not designed to conflict with or obstruct with any state or local plans regarding renewable energy or energy efficiency.

## 7. Geology and Soils

The level of impacts to geology and soils are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	No	No	Yes	No
B	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking?	No	No	Yes	No
C	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction?	No	No	No	Yes
D	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving landslides?	No	No	No	Yes
E	Result in substantial soil erosion or the loss of topsoil?	No	No	Yes	No
F	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	No	No	Yes	No
G	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
H	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	No	No	No	Yes
I	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	No	No	Yes	No

**Discussion of Impact Assessment**

7A. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

**Less than significant impact.** Any constructed facility will be designed and reviewed by a licensed Civil Engineer and will be built in accordance with California seismic design standards. The structures associated with remediation activities are usually small one-story structures constructed in accordance with current seismic standards contained in the Uniform Building Code. While it is possible that injection could trigger an earthquake, this occurrence is rare and will cause minor seismic activity. Therefore, substantial adverse effects including risk of loss, injury, or death are unlikely. In addition, the siting criteria of the local agencies will establish appropriate locations and seek to avoid or minimize, on a site-specific basis, any potential for risk to people or structures

7B. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

**Less than significant impact.** See response 7a (above).

7C. Would the project directly or indirectly cause potential substantial adverse

effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage under the proposed General Order are not anticipated to cause ground failure or liquefaction due to limited amendment volumes and returning of waste from the groundwater basin from which it originated.

- 7D. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage under the proposed General Order are not anticipated to cause landslides.

- 7E. Would the project result in substantial soil erosion or the loss of topsoil?

**Less than significant.** Grading, installation of impervious surfaces, and improper storm water management may cause soil erosion and loss of topsoil during construction and operation of the remediation system. However, section II.A of the proposed General Order requires applicants to prepare a RAP that includes a Stormwater Management Plan to control off-site sediment deposition.

- 7F. Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

**Less than significant.** Applicants are required to assess the geology and incorporate applicable building standards or mitigation measures to avoid geologic catastrophes and protect human health. See response #7a (above).

- 7G. Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks of life or property?

**Less than significant.** The exact locations of the groundwater remediation projects within the Lahontan Water Board boundaries is unknown. The General Order is designed to comply with applicable general plans, specific plans, and regional plans. All applicants are required to comply with local government ordinances and California building codes. According to section 1803.2 of the 1994 Uniform Building Code, when expansive characteristics of soil are determined an expansive index test must be conducted and the soil

classified. Foundations for structures resting on soils with an expansive index greater than 20 requires special design consideration.

- 7H. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

**No impact.** Applicants are required to assess the geology and incorporate applicable building standards or mitigation measures to avoid geologic catastrophes and protect human health. The proposed General Order does not regulate disposal of domestic wastewater. Those activities may be regulated under separate WDRs.

- 7I. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

**Less than Significant Impact.** Applicants are required to submit a Sensitive Receptor Survey and Protection Plan as part of their Report of Waste Discharge that includes an assessment of unique paleontological resources paleontological resources to ensure the area is protected from discharges of waste and disturbance. Despite diligent advance research, inadvertent discoveries may occur of paleontological resources. In such cases, work crews will stop work in the vicinity of a cultural resource discovery to avoid damage until a qualified archaeologist can assess the significance of the find. If necessary, treatment measures will be developed in consultation with appropriate agencies and tribal representatives.

## 8. Greenhouse Gas Emissions

The level of impacts to greenhouse gas emissions are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
B	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	No	No	No	Yes

### Discussion of Impact Assessment

- 8A Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

**Less than significant impact.** Greenhouse gas emissions generated by an increase in vehicular traffic and operation of remedial equipment will be minor, localized, temporary, and will have less than significant impacts to the environment. Project proponents will be required to comply with local, state and federal laws, regulations, and plans associated with reducing greenhouse gas emissions. If in a remote area where no power exists, using a portable gas-powered generator to power the pumps and whatever other equipment is needed, the exhaust released would insignificantly add to the carbon emissions, which is a greenhouse gas emission. The incremental addition is expected to be extremely small and temporary, thus having a less than significant impact.

- 8B. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

**No impact.** The proposed General Order is not designed to conflict with any local, state, or federal plans related to reducing greenhouse gas emissions. The Lahontan Water Board supports in-situ and ex-situ remediation activities that incorporate methods to reduce greenhouse gases into the project design.

### 9. Hazards and Hazardous Materials

The level of impacts to hazards and hazardous materials are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	No	No	Yes	No
B	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	No	No	Yes	No
C	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	No	No	Yes	No
D	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No	No	Yes	No
E	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	No	No	Yes	No
F	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	No	No	No	Yes
G	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	No	No	Yes	No

## Discussion of Impact Assessment

- 9A. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

**Less than significant impact.** Many of the chemical compounds (groundwater amendments) used to remediate groundwater may create hazardous conditions due to their physical composition and characteristics. For example, the dust from oxidants' permanganate and persulfate is hazardous, the presence of ozone and permanganate increases the flammability of many materials, the generation of ozone can involve high voltage equipment concerns, there is a potential for uncontrolled exothermic reactions, and there is the potential for preferential migration of oxidants and/or pollutants through underground utilities.

Some of the amendments and investigation derived waste may need to meet federal and state hazardous waste transportation and waste generation guidelines

Waste designated as hazardous waste is not authorized for disposal at remediation sites eligible for enrollment under the General Order.

Although many groundwater amendments are listed as hazardous materials, the compounds are known to treat groundwater to acceptable drinking water levels when used in a controlled environment.

The General Order is designed to be applicable throughout the Lahontan region and in a variety of situations. In-situ and ex-situ remediation are anticipated to occur in locations where the land use pertains to solid waste disposal, wastewater treatment, and industrial activities (i.e., mining, metal plating, petroleum dispensing/production, and automobile/aircraft maintenance, etc.) to name a few. Remediation sites may be located near schools, airports, residential neighborhoods, and hazardous materials/wastes sites identified on the Cortese List compiled pursuant to Government Code section 65962.5. Lahontan Water Board and Department of Toxic Substance Control (DTSC) staff work cooperatively at groundwater remediation sites. Responsible parties/dischargers may be jointly regulated by Lahontan Water Board and DTSC staff and other state agencies.

To ensure protection against exposure to hazardous materials/hazardous waste, section II.A. of the General Order requires submittal of a RAP including development of a Health and Safety Plan (HSP), Remediation



System Failure Contingency Plan (RSFCP), and an Operation and Maintenance plan (OMP). These plans must identify the chemicals that are to be used, possible exposure risks, and the health and safety measures that will be incorporated throughout the life of the project to protect workers, the public, and the environment from exposure to hazardous material/hazardous waste due to an unauthorized release of amendments. The plans must indicate the training and qualifications of the personnel required to implement the various aspects of the plans and respond to any emergencies caused by an unauthorized release and potential exposure to hazardous concentrations of amendments. These documents must outline the requirements for the handling of hazardous materials and limit the possibility of these materials being released to the public and/or the environment. Development and implementation of these documents reduces these impacts to a less than significant level.

The proposed General Order is not anticipated to create a significant hazard to the public. Enrollees are required to comply with local, state and federal laws and regulations associated with the transportation, use and disposal of hazardous materials including the Resource Conservation and Recovery Act (RCRA) and CCR, Title 22, Division 4.5. Project proponents are not authorized under the General Order to dispose of hazardous materials outside designated disposal facilities.

The plans required in the NOI/RAP must be designed to avoid creating hazards to the public or environment through the routine transport, use, or disposal of hazardous materials.

- 9B. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

**Less than significant impact.** See response #9a (above). The proposed General Order is not anticipated to create a significant hazard to the public. Project proponents are required to comply with local, state, and federal regulations associated with the generation, handling, and transportation of hazardous materials. Furthermore, spills and accidental release of amendments are prohibited and applicants must evaluate health and safety issues associated with the remedial activities and provide a protection plan for those involved in the operation and maintenance of the site.

- 9C. Would the project emit hazardous emissions or handle hazardous or acutely

hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

**Less than significant impact.** See response #9a (above). Any unauthorized release of contaminants to soil or groundwater requires remediation of the release regardless of the location. All groundwaters basins within the state have designated municipal beneficial uses, for drinking water purposes, unless the basin has been de-designated. The responsible party of the unauthorized release will be required to remediate the release which may include the use of amendments. Several amendments listed are considered hazardous due to their corrosivity and toxicity values. However, in a controlled environment, the listed amendments are known and proven to treat contaminated groundwater to comply with California Division of Drinking Water Maximum Contaminant Levels.

Applicants are required to assess the project and the amendments being used to determine if hazardous emissions will occur and if special handling of the chemical is required. Hazardous emissions are regulated by the California Air Resources Board and all applicants are required to comply with all local, state and federal regulations regarding air quality. Applicants are also required to submit a Sensitive Receptor Survey and Protection Plan to identify sensitive receptors and mitigation measure to protect those receptors and a Health and Safety Plan to identify the chemicals being used and mitigation measures that will be incorporated throughout the life of the project to protect on-site workers and the general public. Furthermore, applicants are required to submit a Remediation System Failure Contingency Plan to address procedures that will be implemented to respond to any emergencies caused by an unauthorized release due to failure of the remediation system.

- 9D. Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

**Less than significant impact.** See responses #9a and #9c (above). It is possible that a project eligible for coverage under the proposed General Order will be located on a site that is listed as a hazardous material site pursuant to Government code section 65962.5. However, the purpose of the proposed General Order is to cleanup the sites, eliminating the hazard from the public, and removing the sites from the list.

- 9E. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

**Less than significant impact.** See responses #9a and #9c (above). All external equipment must comply with federal, state, and local ordinances regarding noise and safety. Noise abatement equipment or techniques must be incorporated where necessary to meet applicable noise ordinances.

- 9F. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

**No impact.** The proposed General Order is not anticipated to interfere with any emergency response or evacuation plan.

- 9G. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

**Less than significant.** Some of the amendments authorized for use under the General Order may accelerate burning when involved in a fire and present other fire and explosion hazards. Proper handling and storage of the amendments is required under the General Order. Dischargers must evaluate the hazards and implement measures for protection of on-site personnel, emergency personnel, and the general public as a prerequisite for coverage under the General Order. Remedial activities that do not meet the requirements, may have coverage terminated and individual WDRs issued by the Executive Officer.

## 10. Hydrology and Water Quality

The level of impacts to hydrology and water quality are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
B	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	No	No	Yes	No
C	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in a substantial erosion or siltation on- or off-site?	No	No	Yes	No
D	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?	No	No	Yes	No
E	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	No	No	Yes	No
F	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
G	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	No	No	Yes	No
H	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	No	No	No	Yes

### Discussion of Impact Assessment

- 10A. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

**Less than significant impact.** Water quality standards are a combination of established beneficial uses and numerical or narrative water quality objectives in both surface water and groundwater. The Basin Plan, Chapter 2, lists the present and potential beneficial uses. Chapter 3 lists the narrative and numerical water quality objectives. In addition, the Basin Plan, Chapter 4.1 lists Regionwide Prohibitions that apply to all discharges regionwide, including those regulated under the General Order. Violation of the waste discharge requirements is prohibited and violation of water quality standards, including accepted SNMPs, outside the treatment zone is prohibited. Project that are expected to cause long term degradation of the assimilative capacity of a groundwater basin are not eligible for enrollment under the General Order.

Water quality standards may be exceeded during in-situ groundwater remediation through the application of amendments directly to the groundwater basin but the degradation is only authorized within a defined treatment zone. Ex-situ remediation projects may also utilize amendments but are not anticipated to violate water quality standards because the groundwater within the treatment zone is extracted, treated above the ground surface, and routinely sampled prior to discharge to ensure the waste meets cleanup goals.

The amendments authorized for use are intended to have an overall, long-term beneficial effect, improving groundwater quality by promoting

degradation or stabilization of wastes for a variety of organic, inorganic, and heavy metal pollutants. Impacts to downgradient receptors outside the treatment zone are not authorized under the General Order. Pursuant to section II.A. of the General Order, project proponents are required to submit a RAP that describes the hydraulic controls to be employed to ensure the groundwater beneficial uses and water quality objectives, included in Chapters 2 and 3 of the Basin Plan, are not adversely affected nor exceeded, respectively, beyond the treatment zone.

Furthermore, coverage under the General Order will require implementation of an MRP, issued by the Executive Officer, to protect human health and the environment. The MRP will incorporate stringent groundwater monitoring both inside and outside the treatment zone for in-situ and ex-situ remediation activities to ensure pollutants, amendments, and by-products are not migrating offsite. Project proponents that violate water quality standards outside the treatment zone will be required to remediate the impacts and are subject to enforcement action, including imposition of administrative civil liabilities and potential criminal indictments. Individuals affected by the pollution may be provided safe and clean drinking water until the water quality meets regulatory standards, pursuant to the federal Safe Drinking Water Act and state regulations. The General Order prohibits violation of cleanup goals and continued discharge of pollutants.

- 10B. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

**Less than Significant.** The General Order does not authorize significant depletion of groundwater supplies or interference with groundwater recharge, but a small net loss may occur from discharges to land due to evaporation. Ex-situ remediation activities must return the groundwater to the same groundwater basin from which it was withdrawn and the treated groundwater may be discharged to ephemeral drainages in attempt to limit the amount of loss and promote groundwater supply sustainability.

- 10C. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off- site?

**Less than significant impact.** Project applicants are required, pursuant to

section II.A of the General Order, to submit a RAP that includes a Storm Water Management Plan to control storm water to limit erosion and offsite sediment deposition and to submit a Maintenance Plan for those projects that propose to discharge treated groundwater to an ephemeral drainage to limit alteration of the existing drainage pattern and course of the drainage.

- 10D. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite?

**Less than significant impact.** See response #10c (above).

- 10E. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would create or contribute runoff water which would exceed the capacity or existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

**Less than significant impact.** The General Order is designed to allow the addition of impervious surfaces, if necessary, which may increase the rate of runoff and to allow discharges to ephemeral drainages. However, Storm water runoff and discharges to ephemeral drainages must be managed by project proponents in a manner that prevents scouring, erosion and sediment deposition downstream. Discharges to ephemeral drainages during storm events may be restricted to prevent exceedance of the drainage capacity and discharges are routinely sampled to ensure the treated groundwater meets cleanup goals.

- 10F. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would impede or redirect flood flows?

**Less than significant impact.** The proposed General Order is designed to prohibit the alteration of drainage patterns and impacts to surface waters, but additional impervious surfaces may be installed. The amount of runoff generated as a result of the additional impervious surfaces is anticipated to

be relatively small in volume and not increase flood flows.

- 10G. Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

**Less than significant impact.** The General Order is designed to be applicable throughout the Lahontan region. Flooding and seiche hazards are present in various counties within Lahontan region; therefore, pollutants have the potential to be released into the environment during a natural disaster. Project proponents are required, pursuant to section II.A of the General Order to submit a RAP that includes identification of natural hazard zones and to prepare an Emergency Response Plan in the event of a natural disaster.

- 10H. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

**No impact.** The General Order would not obstruct implementation of a water quality control plan or sustainable groundwater management plan.

## 11. Land Use and Planning

The level of impacts to land use and planning are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Physically divide an established community?	No	No	No	Yes
B	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	No	No	No	Yes

### Discussion of Impact Assessment

- 11A. Would the project physically divide an established community?

**No impact.** The General Order does not support division of an established community. The nature of remediation activities (non-linear, small size, limited infrastructure, temporary) allowed under the General Order does not



contribute to physically dividing an established community.

- 11B. Would the project cause a significant environmental impact due to conflict with any land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

**No impact.** Adoption of the General Order and the remediation activities eligible for coverage would not conflict with any land use plan, policy, or regulation.

## 12. Mineral Resources

The level of impacts to mineral resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	No	No	No	Yes
B	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	No	No	No	Yes

### Discussion of Impact Assessment

- 12A. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

**No impact.** Many quarries exist in the Lahontan region, extracting lanthanide minerals, iron ore, pumice, marble, limestone, talc, asbestos, sand and gravel, and gold. Some technologies used to extract the minerals include the use of man-made volatile organic compounds. Therefore, in-situ and ex-situ remediation may occur at a mining quarry that produces a valuable mineral resource which are subject to the same regulatory standards, but project implementation is not anticipated to reduce the availability of the commodity.

- 12B. Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or

other land use plan?

**No impact.** Adoption of the General Order and remediation activities eligible for coverage, are not anticipated to impact the availability of a local mineral resource recovery site.

### 13. Noise

The level of impacts to noise are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Generation a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	No	No	Yes	No
B	Generation of excessive groundborne vibration or groundborne noise levels?	No	No	Yes	No
C	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No	No	Yes	No

#### Discussion of Impact Assessment

- 13A. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

**Less than significant impact.** Remediation sites eligible for coverage under the General Order are not anticipated to generate noise levels above local government ordinances. Noise abatement equipment or techniques must be incorporated where necessary to comply with local regulatory noise ordinances.

13B. Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

**Less than significant impact.** In-situ and ex-situ remediation activities are not anticipated to generate excessive ground-borne vibration of ground-borne noise levels.

13C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

**Less than significant impact.** In-situ and ex-situ remediation activities may occur in the vicinity of a private airstrip, within two miles of a public airport, and in the vicinity of an airport land use plan. Project proponents are required to comply with all local regulatory noise ordinances. Noise abatement equipment or techniques must be incorporated where necessary to comply with local regulatory noise ordinances.

#### 14. Population and Housing

The level of impacts to population and housing are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	No	No	No	Yes
B	Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	No	No	No	Yes

#### Discussion of Impact Assessment

14A. Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or

directly (for example, through extension of roads or other infrastructure)?

**No impact.** In-situ and ex-situ remediation are not predicted to induce substantial unplanned population growth.

14B. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

**No impact.** In-situ and ex-situ remediation activities are not expected to displace people and housing or generate the need for replacement housing.

## 15. Public Services

The level of impacts to public services are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Fire protection?	No	No	No	Yes
B	Police protection?	No	No	No	Yes
C	Schools?	No	No	No	Yes
D	Parks?	No	No	No	Yes
E	Other public facilities?	No	No	No	Yes

## Discussion of Impact Assessment

15A. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any fire protection, police protection, schools, parks, or any other public facilities?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage are not expected to necessitate the need to increase the numbers of emergency personnel or construction of new government facilities to maintain emergency

response times or other performance objectives for any other public services listed.

## 16. Recreation

The level of impacts to recreation are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	No	No	No	Yes
B	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No	No	No	Yes

### Discussion of Impact Assessment

- 16A. Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

**No impact.** In-situ and ex-situ remediation projects eligible for coverage are not anticipated to increase the use of existing regional parks or recreational facilities.

- 16B. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

**Less than significant impact.** In-situ and ex-situ remediation activities eligible for coverage do not include recreational facilities and are not anticipated to require the construction or expansion of recreational facilities.

## 17. Transportation

The level of impacts to transportation are evaluated based on the following questions

posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	No	No	No	Yes
B	Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	No	No	No	Yes
C	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	No	No	Yes	No
D	Result in inadequate emergency access?	No	No	Yes	No

### Discussion of Impact Assessment

- 17A. Would the project conflict with program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage are not anticipated to conflict with any local government ordinance regarding safe and effective transportation policies.

- 17B. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?

**No impact.** Adoption of the General Order and activities associated with groundwater and soil remediation would not conflict with or be inconsistent with any CEQA guidelines.

- 17C. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

**Less than significant impact.** \*In-situ and ex-situ remediation activities are not anticipated to increase hazards due to geometric design features or

create incompatible uses. Applicants should comply with all local planning and building design ordinances intended to address such conditions.

17D. Would the project result in inadequate emergency access?

**Less than significant impact.** Remediation sites eligible for coverage should comply with local government laws and ordinances regarding emergency access. Applicants are required to submit an Emergency Response Plan to identify the actions taken throughout the life of the project to protect on-site workers and the public.

### 18. Tribal Cultural Resources

The level of impacts to tribal cultural resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	No	No	No	Yes
B	A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	No	No	No	Yes

## Discussion of Impact Assessment

- 18A. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, on in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

**No impact.** The Lahontan Water Board initiated AB 52 Tribal Consultation on July 3, 2018, pursuant to Public Resources Code section 21080.3.1. A request for consultation was received from San Manual Band of Mission Indians, and the Lahontan Water Board consulted with the Tribe.

When soil excavation is necessary to construct and implement the remediation, that work is anticipated to occur in areas already constructed or disturbed and the likelihood of encountering tribal cultural resources is low. Any associated soil movement and disturbance is unlikely to create a significant impact to cultural resources in comparison to existing baseline conditions. However, Section II.A of the proposed General Order requires applicants to submit a RAP including a Sensitive Receptor Survey and Protection Plan to identify impacts to cultural resources. In-situ and ex-situ remediation activities eligible for coverage under the General Order are not authorized to demolish, destroy, relocate, or alter the historical resource such that the significance of the historical resource would be materially impaired. Applicants are encouraged to contact the California Historical Resources Information Center relative to the County at which the proposed remediation will occur. A list of information centers can be found on the [National Register of Historic Places](#) website. Despite diligent advance research, inadvertent discoveries may occur. In such cases, work crews will stop work in the vicinity of a cultural resource discovery to avoid damage until a qualified archaeologist can assess the significance of the find. If necessary, treatment measures will be developed in consultation with appropriate agencies and tribal representatives. Such measures could include requiring that the site be avoided, conducting recovery excavations, and/or capping the site to avoid further disturbance of artifacts.

- 18B. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined



in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency must consider the significance of the resources to a California Native American tribe.

**No impact.** See response #18a (above).

### 19. Utilities and Service Systems

The level of impacts to utilities and service systems are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	No	No	Yes	No
B	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	No	No	No	Yes
C	Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	No	No	No	Yes
D	Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure,	No	No	No	Yes

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
	or otherwise impair the attainment of solid waste reduction goals?				
E	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	No	No	No	Yes

### Discussion of Impact Assessment

- 19A. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or the construction or relocations of which could cause significant environmental effects?

**Less than significant impact.** In-situ and ex-situ remediation activities are not anticipated to affect existing utilities and service systems. New construction of on-site treatment systems may occur, additional stormwater drainage systems may need to be constructed, and the project may need to connect to the existing utility systems. Applicants are required to submit a RAP that describes the treatment system and to submit a Stormwater Management Plan.

- 19B. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

**No impact.** It is anticipated sufficient water supplies will be available for treatment throughout the life of the remediation project.

- 19C. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

**No impact.** The waste is not anticipated to be discharged to a wastewater treatment system.

- 19D. Would the project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

**No impact.** The amount of solid waste generated by remediation activities is expected to be minimal and not exceed state or local standards, local infrastructure, or impair the attainment of solid waste reduction goals. Solid waste must be containerized, properly labeled, and disposed of within 90 days of generation.

19E. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

**No impact.** In-situ and ex-situ remediation activities are anticipated to comply with all local, state, and federal regulations regarding solid waste disposal. Copies of hazardous waste and/or non-hazardous waste manifests produced during generation and transportation of waste should be submitted to the Lahontan Water Board in the routine compliance monitoring reports.

## 20. Wildfire

The level of impacts to wildfire are evaluated based on the following questions posed under impact description in the matrix below as to whether the project is located in or near state responsibility areas or lands classified as very high fire hazard severity zones will the project:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Substantially impair an adopted emergency response plan or emergency evacuation plan?	No	No	No	Yes
B	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	No	No	Yes	No
C	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
D	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	No	No	Yes	No

### Discussion of Impact Assessment

- 20A. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

**No impact.** Adoption of the General Order will not impair an adopted emergency response plan or emergency evacuation plan.

- 20B. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentration from a wildfire or the uncontrolled spread of a wildfire?

**Less than significant impact.** In-situ and ex-situ remediation activities eligible for coverage under the General Order will not exacerbate wildfire risks. However, portable generators use gasoline and some amendments used for groundwater and soil remediation have the potential to cause combustion, cause explosions, and produce harmful vapors when exposed to flame which may require siting, design, and installation of fire safety infrastructure in the event of a wildfire. Enrollees are required to comply with all Occupational Safety and Health Administration regulations. The regulations include proper training of personnel, an emergency response plan, proper labeling of chemicals, access to chemical safety data sheets, and on-site fire extinguishers.

- 20C. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

**Less than significant impact.** Installation of remediation infrastructure is not anticipated to exacerbate fire risk. All remediation infrastructure are required to comply with local and state fire hazard ordinances and laws, intended to reduce a project's fire risk.

20D. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff post-fire slope stability, or drainage changes?

**Less than significant impact.** In-situ and ex-situ remediation sites should be designed to be protective of life and structures.

## 21. Mandatory Findings of Significance

The level of impacts to mandatory findings of significance are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
B	Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)?	No	No	Yes	No
C	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	No	No	Yes	No

**Discussion of Impact Assessment**

Pursuant to CCR, title 14, section 15065, the Lahontan Water Board assessed the Mandatory Findings of Significance to determine if the proposed General Order would have a significant impact on human health and the environment. The mandatory findings of significance include the following:

- 21A. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

**Less than significant impact.** Discharges of waste authorized under the General Order are prohibited from causing a condition of pollution and nuisance, adversely affecting beneficial uses of groundwater and surface water outside the treatment zone, and causing an exceedance of any applicable Basin Plan water quality objective for groundwater and surface water outside of the treatment zone. The General Order is designed to regulate the discharges of waste associated with groundwater remediation in a manner that is protective of public health, wildlife, and aquatic life while

implementing the State Antidegradation Policy. The degradation within the defined treatment zone from the remedial activities is anticipated to be relatively short-term and produce maximum benefits with respect to water quality and long-term groundwater sustainability.

Pursuant to the provisions of the General Order, project proponents are required to comply with the WDRs outlined under the General Order. Enrollees must implement an MRP to observe the success of the remediation system and detect unauthorized impacts to downgradient receptors. In-situ and ex-situ remediation activities are not authorized to commence until a written determination is received by the Executive Officer that the remedial activities are protective of human health and the environment to the maximum extent practicable.

- 21B. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects)?

**Less than significant impact.** Considering the effects of past remediation activities, the effects of current cleanup actions, and the effects of probably future cleanup actions, the project is unlikely to result in cumulatively considerable effects on the environment. Waste may either be disposed of by subsurface infiltration or injection, surface infiltration or percolation trenches or basins, evaporation ponds, land spreading, spray disposal, irrigation, or discharged to ephemeral drainages. Discharge of waste must be limited to the same groundwater basin from which the water was withdrawn. While more than one remediation activity could occur within the same groundwater basin, it is unlikely to result in cumulatively considerable effect. Infrastructure associated with the remediation would be removed and the site restored to pre-project conditions to the maximum extent practicable upon completion and pollution would be remediated thus improving conditions in the groundwater.

Some of the amendments authorized for use are considered hazardous to humans and aquatic organisms, are reactive, combustible, and require special handling and storage. However, the General Order contains requirements and prohibitions to ensure the hazardous materials are handled, stored, and disposed of properly. Adoption of the General Order and the remediation activities eligible for coverage are expected to result in net

positive benefits to groundwater quality while allowing temporary water quality degradation within a defined treatment zone. Prior to eligibility determination, applicants are required to submit a RAP to identify the methods of compliance with WDRs and prohibitions to protect human health and the environment. Enrollees are required to monitor groundwater downgradient of the treatment zone to guarantee compliance with the WDRs and prohibitions.

Pursuant to section II.A of the General Order, project proponents are required to submit a RAP that identifies all sensitive receptors and measures to protect sensitive receptors. The document must include all biological resources, cultural resources (including unique paleontological resources), surface waters, and water supply wells (municipal and private domestic water supply, agricultural supply, industrial supply, etc.) located onsite and within 500 feet of the plume boundary and compliance point(s). The technical documents required in the RAP are required to ensure protection of water quality and the environment.

- 21C. Does the project have environmental effects which will cause substantially adverse effects on human beings, either directly or indirectly?

**Less than significant.** See response #21C (above). In-situ and ex-situ remediation activities eligible for coverage under the proposed General Order are expected to remediate groundwater. The General Order requires compliance with all local, state, and federal laws and regulations. Compliance will bring favorable results and not cause adverse effects on human beings, either directly or indirectly.



#### **IV. NEGATIVE DECLARATION**

**Project Title:** General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects

**Lead Agency:** Lahontan Regional Water Quality Control Board

**South Lake Tahoe Office Address:** 2501 Lake Tahoe Boulevard  
South Lake Tahoe, CA 96150

**Victorville Office Address:** 15095 Amargosa Road, Building 2, Suite 210  
Victorville, CA 92394

**Contact person and information:** Kerri O’Keefe, Engineering Geologist  
Phone: (530) 542-5473  
Email: kerri.okeefe@waterboards.ca.gov

**Project location:** Project locations will vary throughout the jurisdiction of the Lahontan Water Board including portions of Alpine, El Dorado, Inyo, Kern, Lassen, Los Angeles, Modoc, Mono, Nevada, Placer, Plumas, San Bernardino, and Sierra counties.

**Zoning:** The remediation sites are anticipated to be conducted in areas with varying zoning ordinances. The restrictions may vary per project location. All applicants should remain compliant with city, county, state and federal ordinances and laws related to zoning and land use.

**General Plan Designation:** Varies throughout the Lahontan region.

**Surrounding land uses and setting:** The project will apply to sites throughout the jurisdiction of the Lahontan Water Board, including areas with all types of land uses and settings. Land use restrictions may be placed on the land associated with remediation sites if hazardous materials or hazardous wastes or constituents remain in soils and groundwater on the site property at levels that are harmful to human health and the environment.

**Other public agencies whose approval is required:** Permits may be required by local governments and other regulatory agencies for, but not limited to, working in public right-of-way, scenic quality requirements, installing groundwater monitoring/remediation wells, site grading, construction of structures and roads, installation of utilities, and discharges that have the potential to impact air quality.

**Project Description:** Pursuant to Division 7 of the California Water Code, the Lahontan Water Board is proposing to adopt a General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation (General Order) to regulate the use of chemical,

organic and biological compounds for cleanup at polluted groundwater sites and to regulate the discharges of the waste associated with the cleanup.

Under regulatory oversight and strict monitoring, the various compounds authorized for use are known to reduce pollutant concentrations in groundwater to acceptable drinking water levels. The compounds include chemical oxidants, chemical oxidant activators, aerobic bioremediation enhancement compounds, anaerobic degradation enhancement compounds, reduction degradation enhancement compounds, metals precipitation/stabilization, sorption/biodegradation biomatrix, surfactants/co-solvents, bioaugmentation organisms, tracer study compounds, buffer solutions and pH adjusters, biofouling control agents, adsorption injectants.

The proposed General Order will authorize the disposal of waste by subsurface infiltration or injection, surface infiltration or percolation trenches or basins, evaporation ponds, land spreading, spray disposal (i.e., for dust control), or irrigation and allow discharge to ephemeral drainages that are not waters of the US. The waste must be returned to the same groundwater basin that the water was withdrawn to promote groundwater supply sustainability.

Adoption of the General Order and the remediation activities eligible for coverage are expected to result in net positive benefits to groundwater quality while allowing temporary water quality degradation within a defined treatment zone. Prior to eligibility determination, applicants are required to submit a Remedial Action Plan (RAP) to identify the methods of compliance with waste discharge requirements and prohibitions to protect human health and the environment. Issuance of coverage under the General Order is at the discretion of the Executive Officer. Applicants are required to determine the assimilative capacity of the groundwater basin, establish background water quality and monitor groundwater downgradient of the treatment zone to guarantee compliance with the waste discharge requirements and prohibitions. The technical documents are required to ensure protection of water quality and the environment.

Adoption of the General Order would: (a) simplify the application process for enrollees; (b) provide a level of protection comparable to individual, site-specific waste discharge requirements; and (c) preserve water resources by returning the waste to the same groundwater basin.

**Finding:** This is to advise that the Lahontan Water Board, acting as Lead Agency, has approved the project described, above, on [Date], and has made the following determinations regarding the project:

1. The project **will not** have a significant effect on the environment.

2. A Negative Declaration was prepared for this project pursuant to the provision of CEQA.
3. Mitigation measures **were not** made a condition of the approval of the project.
4. A statement of Overriding Consideration **was not** adopted for this project.

This is to certify that the responses and record of project approval is available to the General Public at the offices of the Lahontan Water Board:

- 2501 Lake Tahoe Boulevard, South Lake Tahoe, CA, Phone: (530) 542-5400, Fax: (530) 544-2271
- 15095 Amargosa Road, Building 2 – Suite 210, Victorville, CA 92394, Phone: (760) 241-6583, Fax: (760) 241-730

MICHAEL R. PLAZIAK  
EXECUTIVE OFFICER  
LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD

Date:

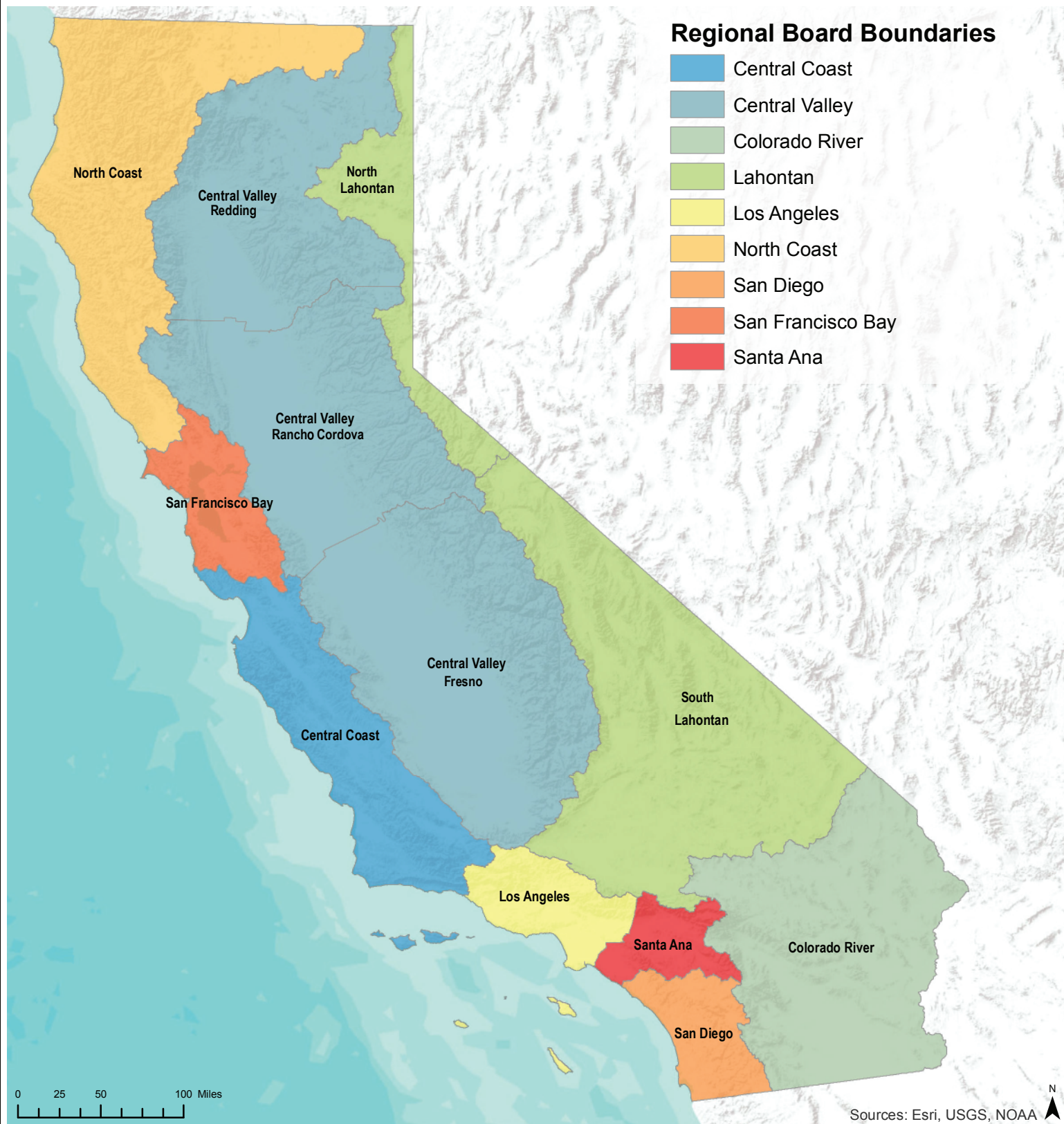
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# FIGURES

# Figure 1 California State Water Resources Control Board Regional Board Boundaries

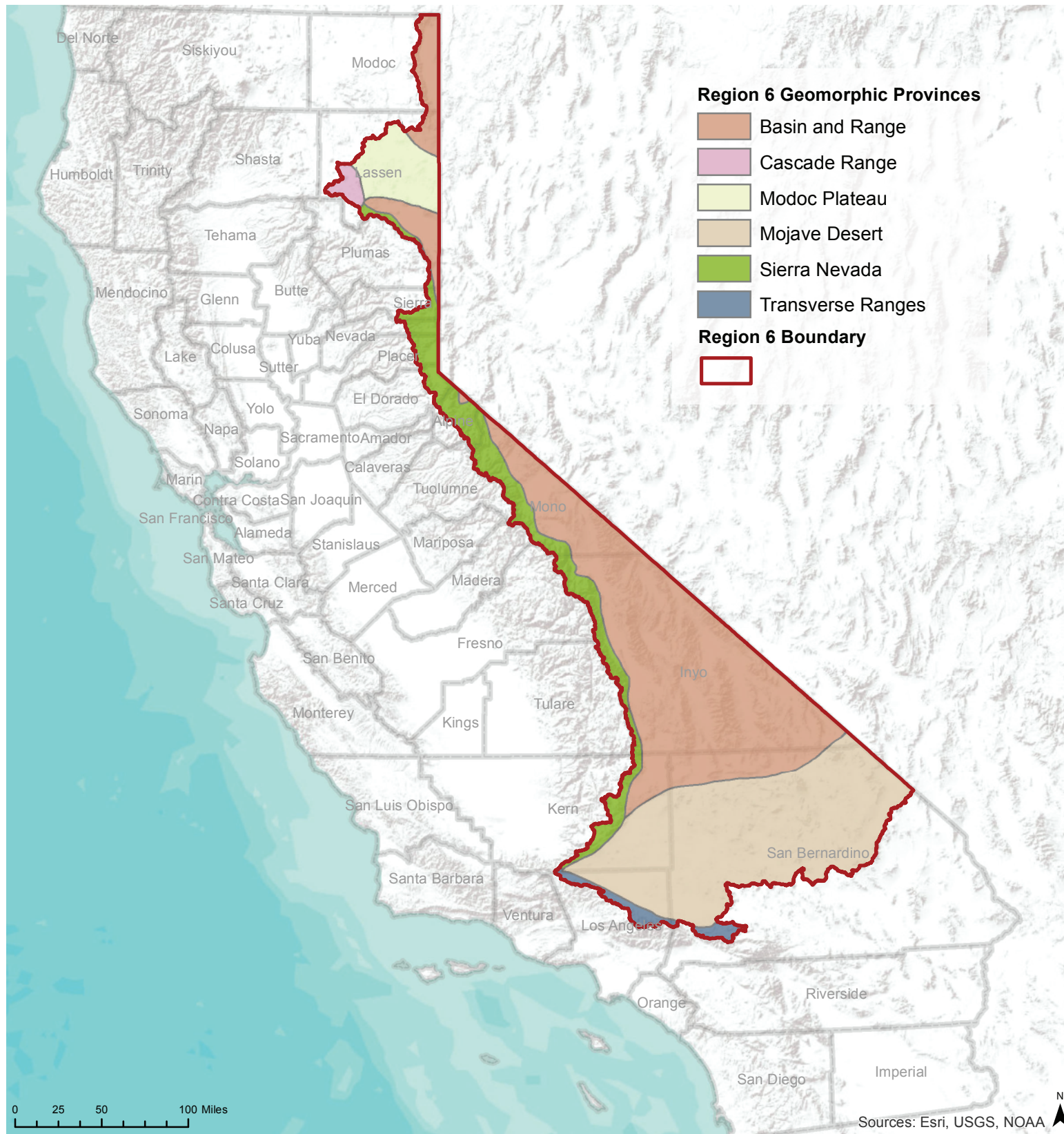


The RWQCB jurisdictions are defined in California Water Code section 13200 and are generally coterminous with the major surface water hydrologic basins of the state. The Regional Board Offices dataset has been compiled from sources (primarily the Calwater v.2.2.1 dataset) at 1:24,000 scale.

Document Path: R:\RB6\RB6Tahoe\SHARED\GIS\Projects\CEQA Maps\CABoardBoundaries.mxd

Figure 2

# Lahontan Regional Water Quality Control Board Geomorphic Provinces



The Geomorphic Provinces of California is a service provided by California's Department of Conservation via <https://gis.conservation.ca.gov/server/rest/services/CGS/GeoGems/MapServer>



Figure 3

# Lahontan Regional Water Quality Control Board North Lahontan Groundwater Basins

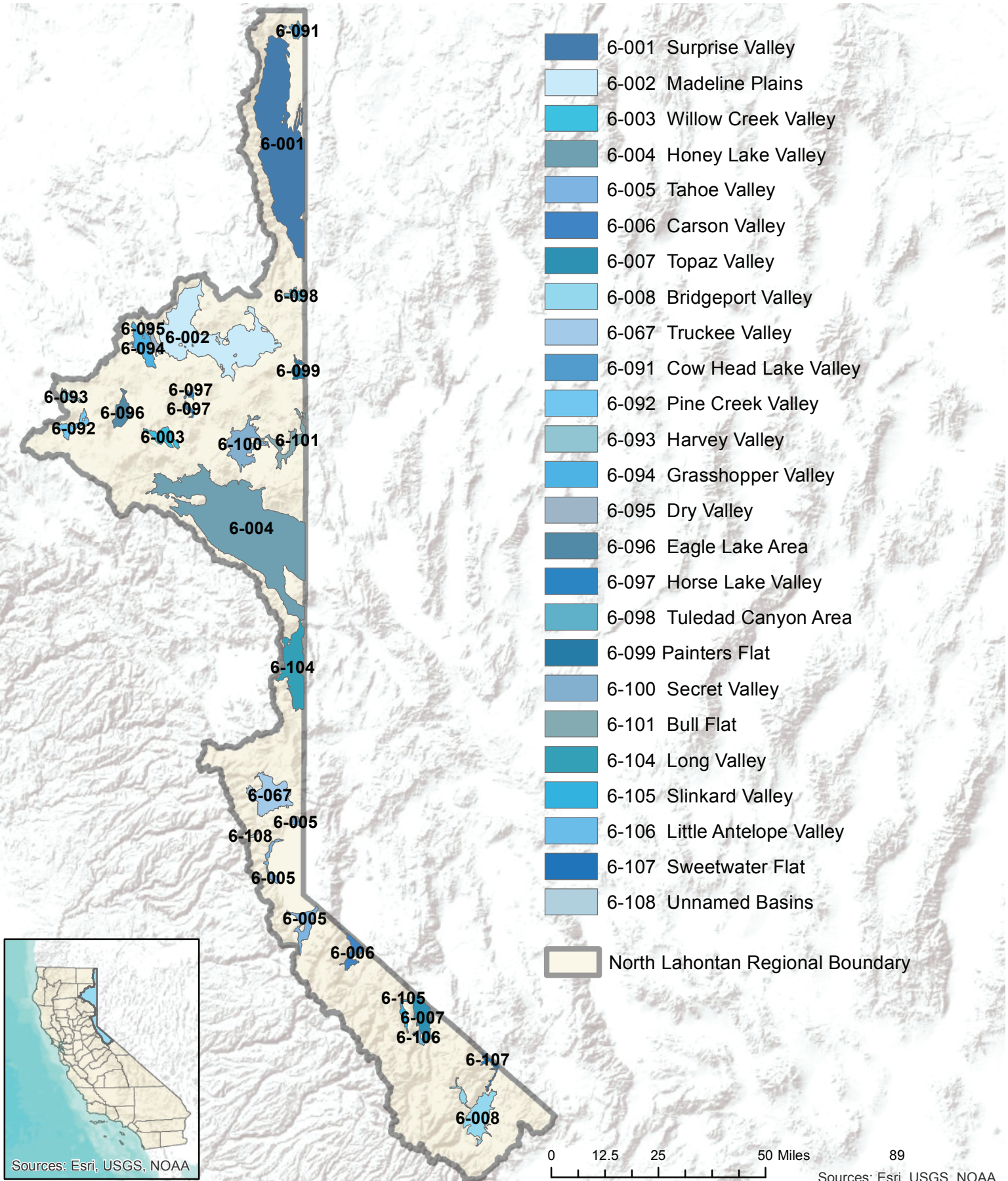
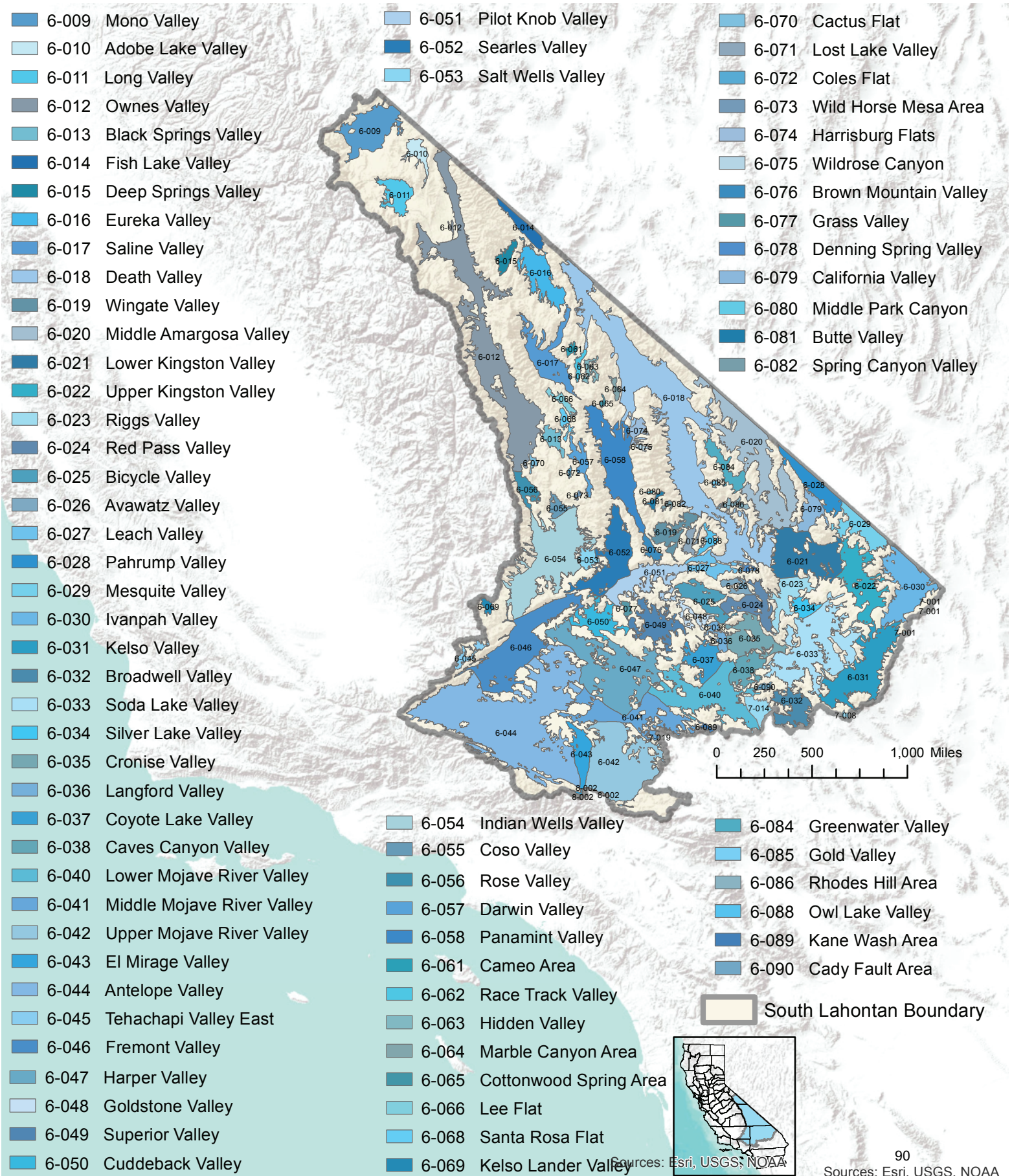
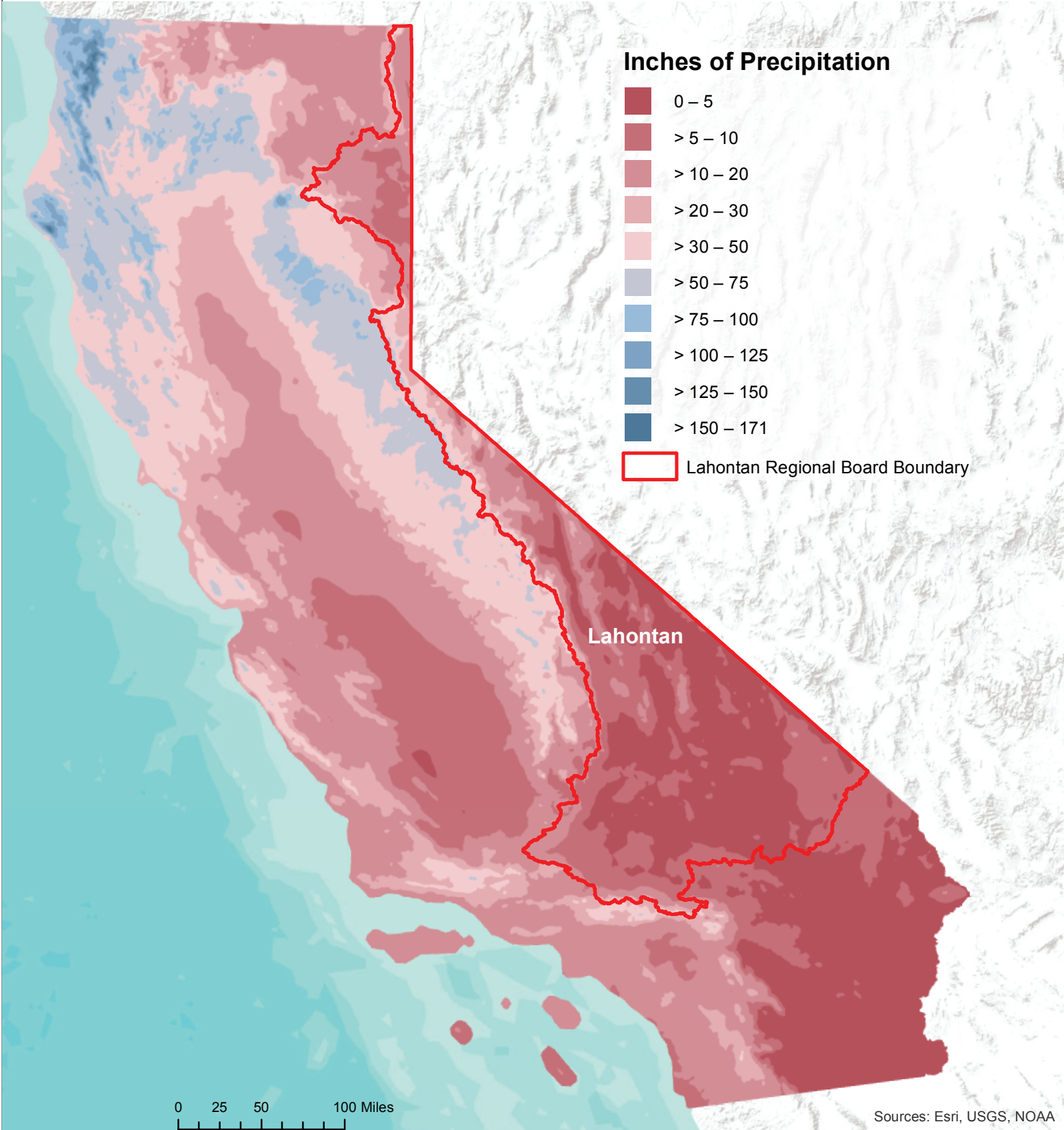


Figure 4

# Lahontan Regional Water Quality Control Board South Lahontan Groundwater Basins



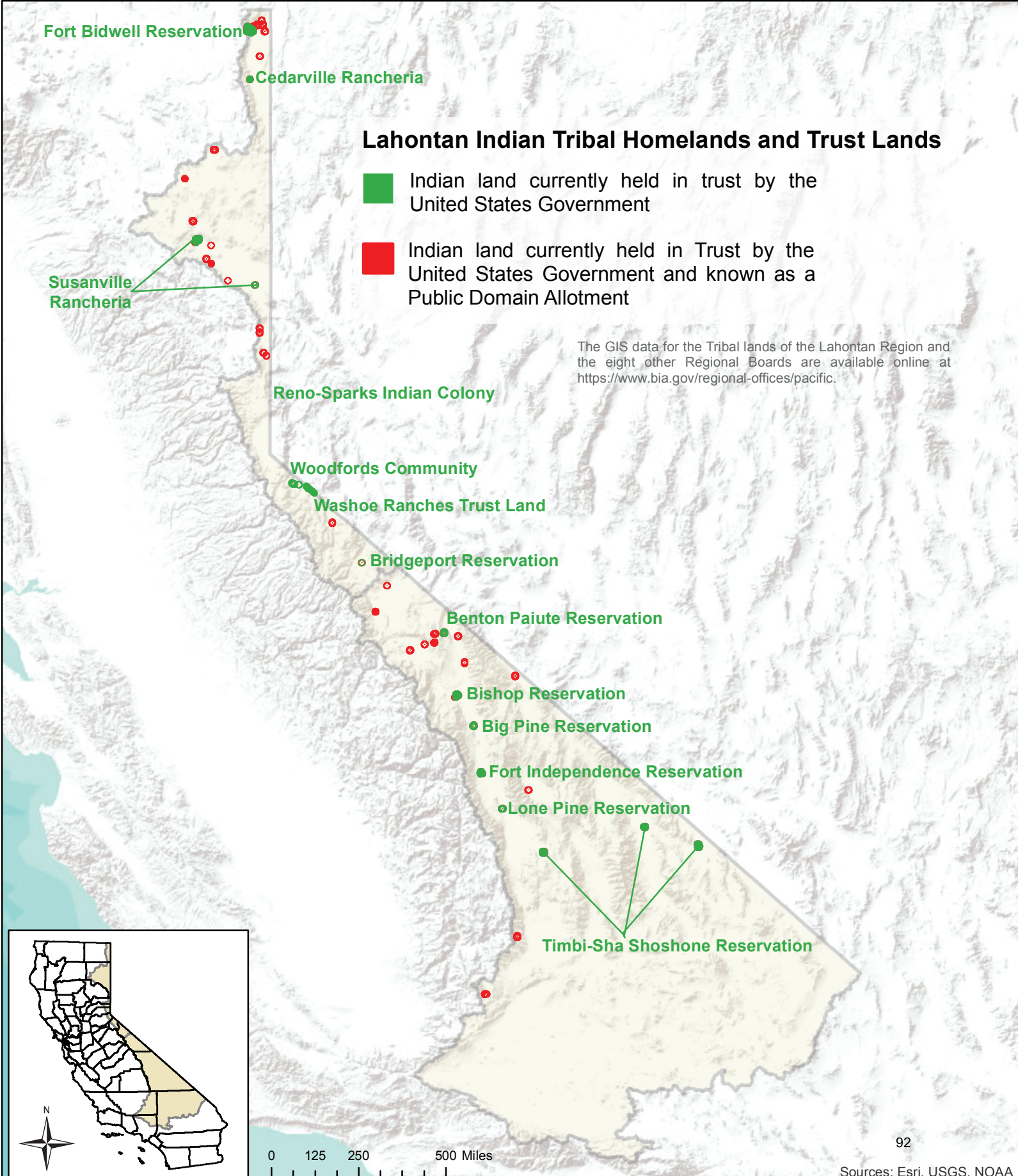
# Figure 5 Lahontan Regional Water Quality Control Board Average Annual Precipitation



The precipitation data are average monthly and average annual precipitation for the climatological period 1961-1990, 1971-2000 and 1981-2010. The maps were created from 30 arc-seconds (~800m) PRISM derived grids. For further information, the online PRISM homepage can be found at <http://www.prism.oregonstate.edu>.

Figure 6

# Lahontan Regional Water Quality Control Board Tribal Homelands and Trust Lands



# **APPENDICES**

**Appendix A**  
**List of Amendments Proposed for In-Situ and Ex-Situ Remediation**  
California Regional Water Quality Control Board  
Lahontan Region

The list below does not represent any endorsement of products or materials by the Lahontan Regional Water Quality Control Board (Lahontan Water Board). Many of the products/materials listed are patented. Users of these products/materials shall comply with any regulations and laws applicable to the use or the products/materials. Some products/materials may contain byproducts or impurities that the Lahontan Water Board does not authorized to be used. Compounds listed under one category can also be used under another category.

**1. Chemical Oxidants**

- Fenton's reagent
  - Hydrogen peroxide
  - Ferrous iron catalyst
- pH buffer
- Hydrogen peroxide
- Ozone
- Potassium permanganate
- Potassium persulfate
- Sodium percarbonate
- Sodium permanganate
- Sodium persulfate

**2. Chemical Oxidant Activators**

- Calcium hydroxide
- Chelating agents
  - Ferric ethyldiaminetetraacetic acid (EDTA)
  - Sodium citrate
  - Sodium malonate
  - Sodium phytate
- Silica and silicates
  - Silicic acid
  - Sodium silicate
  - Silica gel
- Sodium hydroxide

**3. Aerobic Bioremediation Enhancement Compounds**

- Calcium oxide / peroxide

Calcium oxyhydroxide  
Magnesium  
    Oxide / hydroxide / peroxide  
Methane (dissolved phase)  
Propane (dissolved phase)

#### **4. Anaerobic Degradation Enhancement Compounds**

Ammonium chloride  
Ammonium nitrate  
Ammonium sulfate  
Calcium sulfate  
    Gypsum  
Cheese whey  
Complex organic materials  
    Starch  
    Wood chips  
    Yeast extract  
    Grain milling products  
    Chitin  
    Compost  
Complex sugars  
Corn syrup  
Disodium phosphate  
Emulsified vegetable oil  
Ethanol  
Glucose  
Glycerol esters of fatty acids and polylactates  
Glycerol polylactate / tripolylactate  
Glycerol, xylitol, sorbitol  
Guar  
Hematite  
Lactose  
Lecithin  
Magnesium sulfate  
Milk whey  
Methanol  
Molasses  
Monosodium phosphate  
Nitrous oxide  
Organic acids (acetate, lactate, propionate, benzoate, and oleate)  
Orthophosphoric salts

Phosphoric acid  
Polyphosphate salts  
Potassium phosphate  
Potassium sulfate  
Propanol  
Sodium trimetaphosphate  
Sorbitol cysteinate / cysteine  
Triethyl phosphate

**5. Reduction Degradation Enhancement Compounds**

Ferrous chloride  
Ferrous gluconate  
Ferrous sulfate  
Sodium dithionite  
Zero-valent iron

**6. *Metals Precipitation/Stabilization***

Calcium phosphate  
Calcium polysulfide  
Ferrous sulfate  
Sodium tripolyphosphate (STPP)

**7. Sorption/Biodegradation Biomatrix**

Liquid activated carbon

**8. Surfactants/Co-solvents**

Benzenesulfonic acid  
Dioctyl sodium sulfosuccinate  
D-limonene  
Ethoxylated castor oils surfactants  
Ethoxylated cocamide surfactants  
Ethoxylated coco fatty acid surfactants  
Ethoxylated octyl phenolic surfactants  
Sorbitan monooleate  
Xanthan gum

**9. Bioaugmentation Organisms**

Dischargers shall prove that any bacterial genomes in original injection form, its degradation form, other impurity or by-product shall not be human/animal pathogens. Genetically-modified organisms (GMO) should not be used.



Dehalococcoides spp.  
Dehalobacter spp.  
Geobacter  
Methanomethylovorans  
Desulfovibrio  
Desulfobacterium

#### **10. Tracer Study Compounds**

*The tracer compounds shall be highly contrasting and not reactive with current contaminants to be treated. The tracers may be chloride-, bromide-, or fluoride-based salts, or similar materials as approved by the Executive Officer.*

Calcium bromide  
Calcium chloride  
Eosin dyes  
Fluoride salts  
Iodide  
Potassium bromide  
Potassium iodide  
Sodium bromide  
Sodium chloride  
Sodium fluorescein

#### **11. Buffer Solutions and pH Adjusters**

Calcium carbonate  
Calcium magnesium carbonate  
Potassium bicarbonate  
Sodium (carbonate / bicarbonate)

#### **12. Biofouling Control Agents**

Chlorine dioxide  
Calcium hypochlorite  
Sodium hypochlorite  
Hydroxyacetic acid  
Sulfamic acid  
Acetic acid  
Glycolic acid

#### **13. Adsorption Injectants**

Organic Carbon Products

**Appendix B**  
**Threatened and Endangered Species in the Lahontan Region**  
California Regional Water Quality Control Board

<b>Common Name</b>	<b>Taxon Group</b>	<b>Federal Listed</b>	<b>California Listed</b>
Arroyo Toad	Amphibians	Endangered	None
Black Toad	Amphibians	None	Threatened
California Red-legged Frog	Amphibians	Threatened	None
Oregon Spotted Frog	Amphibians	Threatened	None
Sierra Nevada Yellow-legged Frog	Amphibians	Endangered	Threatened
Southern Mountain Yellow-legged Frog	Amphibians	Endangered	Endangered
Yosemite Toad	Amphibians	Threatened	None
<b>Birds</b>			
Bald Eagle	Birds	Delisted	Endangered
Bank Swallow	Birds	None	Threatened
California Condor	Birds	Endangered	Endangered
Gilded Flicker	Birds	None	Endangered
Great Gray Owl	Birds	None	Endangered
Greater Sandhill Crane	Birds	None	Threatened
Inyo California Towhee	Birds	Threatened	Endangered
Least Bell's Vireo	Birds	Endangered	Endangered
Southwestern Willow Flycatcher	Birds	Endangered	Endangered
Swainson's Hawk	Birds	None	Threatened
Tricolored Blackbird	Birds	None	Threatened
Western Snowy Plover	Birds	Threatened	None
Western Yellow-billed Cuckoo	Birds	Threatened	Endangered
Willow Flycatcher	Birds	None	Endangered
Yuma Ridgway's Rail	Birds	Endangered	Threatened
<b>Crustaceans</b>			
Vernal Pool Fairy Shrimp	Crustaceans	Threatened	None
<b>Dicots</b>			
Amargosa Nitrophila	Dicots	Endangered	Endangered
Ash Meadows Daisy	Dicots	Threatened	None
Ash Meadows Gumplant	Dicots	Threatened	None
Ash-gray Paintbrush	Dicots	Threatened	None
Big Bear Valley Sandwort	Dicots	Threatened	None
Bird-foot Checkerbloom	Dicots	Endangered	Endangered
Boggs Lake Hedge-hyssop	Dicots	None	Endangered
Bristlecone Cryptantha	Dicots	None	Rare
California Dandelion	Dicots	Endangered	None
Cushenbury Buckwheat	Dicots	Endangered	None
Cushenbury Oxytheca	Dicots	Endangered	None

<b>Common Name</b>	<b>Taxon Group</b>	<b>Federal Listed</b>	<b>California Listed</b>
Eureka Dunes Evening Primrose	Dicots	Delisted	Rare
Father Crowley's Lupine	Dicots	None	Rare
Fish Slough Milk-vetch	Dicots	Threatened	None
July Gold	Dicots	None	Rare
Lane Mountain Milk-vetch	Dicots	Endangered	None
Long Valley Milk-vetch	Dicots	None	Rare
Mojave Tarplant	Dicots	None	Endangered
Mono Milk-vetch	Dicots	None	Rare
Mt. Gleason Paintbrush	Dicots	None	Rare
Nevin's Barberry	Dicots	Endangered	Endangered
Owens Valley Checkerbloom	Dicots	None	Endangered
Parish's Daisy	Dicots	Threatened	None
Red Rock Tarplant	Dicots	None	Rare
Southern Mountain Buckwheat	Dicots	Threatened	None
Spreading Navarretia	Dicots	Threatened	None
Tahoe Yellow Cress	Dicots	None	Endangered
Tracy's Eriastrum	Dicots	None	Rare
Webber's Ivesia	Dicots	Threatened	None
<b>Fish</b>			
Cottonball Marsh Pupfish	Fish	None	Threatened
Lahontan Cutthroat Trout	Fish	Threatened	None
Mohave Tui Chub	Fish	Endangered	Endangered
Owens Pupfish	Fish	Endangered	Endangered
Owens Tui Chub	Fish	Endangered	Endangered
Paiute Cutthroat Trout	Fish	Threatened	None
<b>Insects</b>			
Carson Wandering Skipper	Insects	Endangered	None
Crotch Bumble Bee	Insects	None	Candidate Endangered
Nevarres Spring Naucorid Bug	Insects	Candidate	None
Quino Checkerspot Butterfly	Insects	Endangered	None
Western Bumble Bee	Insects	None	Candidate Endangered
<b>Mammals</b>			
Amargosa Vole	Mammals	Endangered	Endangered
California Wolverine	Mammals	Proposed Endangered	Threatened
Fisher - West Coast Distinct Population Segment	Mammals	Endangered	Threatened
Gray Wolf	Mammals	Endangered	Endangered
Mohave Ground Squirrel	Mammals	None	Threatened
Sierra Nevada Bighorn Sheep	Mammals	Endangered	Endangered
Sierra Nevada Red Fox	Mammals	Proposed Endangered	Threatened
<b>Monocots</b>			
Eureka Valley Dune Grass	Monocots	Threatened	Rare
San Bernardino Blue Grass	Monocots	Endangered	None

<b>Common Name</b>	<b>Taxon Group</b>	<b>Federal Listed</b>	<b>California Listed</b>
Desert Tortoise	Reptiles	Threatened	Threatened
Southern Rubber Boa	Reptiles	None	Threatened

## **ENCLOSURE 2**

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION**

**BOARD ORDER NO. R6-2022-TENTATIVE**

**GENERAL WASTE DISCHARGE REQUIREMENTS**

**FOR**

**IN-SITU AND EX-SITU GROUNDWATER REMEDIATION PROJECTS**

---

Board Order R6-2022-TENTATIVE (General Order) regulates discharges of waste from in-situ and ex-situ projects implemented to remove pollutants from groundwater (remediation). The purpose of this General Order is to protect groundwater as a municipal source of drinking water and the other beneficial uses described in the Water Quality Control Plan for the Lahontan Region (Basin Plan). [\[Basin Plan - References | Lahontan Regional Water Quality Control Board \(ca.gov\)\]](#).

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## I. REMEDIATION PROJECT CATEGORIES AND DETAILS

### A. Project Types and Threat to Water Quality and Complexity Rating

This General Order regulates discharges of waste, as defined in the California Water Code (CWC), from remediation projects at polluted sites affected by man-made organic constituents, heavy metals, and inorganics. The in-situ and ex-situ remediation projects covered under the General Order are authorized to utilize amendments to eliminate pollutants from groundwater. For purposes of this General Order, "amendments" include biological, chemical, and organic compounds that help to advance/mediate degradation of groundwater pollutants and may be applied to a defined treatment zone or utilized for treatment of polluted groundwater above ground. The "treatment zone" means a three-dimensional area being targeted to receive authorized amendments to achieve cleanup goals and protect beneficial uses. Within the treatment zone, a spatial zone of impact exists in which water quality and beneficial uses are temporarily degraded.

Hereafter, operators of the remediation system and property owners are referred to as "Discharger." Pursuant to Title 23, section 2200, California Code of Regulations (CCR), Dischargers subject to this General Order must pay an annual fee based on the threat to water quality and complexity of the discharge.

This General Order establishes the threat to water quality and complexity ratings (TTWQ/CPLX) for full scale and pilot testing in-situ remediation, large scale ex-situ remediation, and pilot testing/small scale ex-situ remediation.

#### 1. Full Scale and Pilot Test In-Situ Remediation

Full scale and pilot test in-situ groundwater remediation projects discharge those amendments referenced in section I.B directly to the vadose zone or groundwater basin to achieve regulatory compliance with cleanup levels and water quality objectives (WQO). Full scale remediation projects are designed to treat the entire extent and duration of pollution at the site. Pilot tests are

small preliminary studies used to test a proposed research study before a full-scale project is implemented.

In-situ groundwater remediation projects involving the application of amendments directly to the groundwater basin or vadose zone are expected to have the greatest potential to alter water quality. These projects have a TTWQ/CPLX of 2A.

2. Large Scale Ex-Situ Remediation

Large scale ex-situ remediation projects involve the physical extraction of polluted groundwater for treatment above ground. These projects involve the use of amendments referenced in section I.B and discharge of the waste via the methods described in section I.C.

Large scale ex-situ groundwater remediation projects are expected to have minimal pollutant concentrations in the discharge and pose a moderate threat to human health and the environment. These projects have a TTWQ/CPLX of 3B.

3. Small Scale and Pilot Test Ex-Situ Remediation Projects

Small scale and pilot test ex-situ remediation projects are those that have a discharge of less than 10,000 gallons per day, and do not discharge waste within one mile of a domestic, irrigation, industrial, or public water supply well. These projects involve the use of amendments referenced in section I.B. and discharge of the waste via the methods described in section I.C.

Small scale and pilot test ex-situ projects are expected to have minimal pollutant concentrations and pose a minor threat to human health and the environment. These Projects have a TTWQ/CPLX of 3C.

B. Authorized Injection Material Amendments

The amendments listed in Attachment A are authorized to be used for in-situ and ex-situ remediation purposes. The amendments listed in



Attachment A do not represent all chemical, organic, or biological compounds that could be used in remediation. Dischargers may propose to use an amendment that is not listed in Attachment A. If new amendments are proposed, the Dischargers are required to demonstrate the suitability of the materials to remediate the target pollutants and be protective of public health and the environment. Use of any other chemical, organic, or biological compound that is not listed in Appendix A must be approved by the Lahontan Regional Water Quality Control Board (Lahontan Water Board) Executive Officer.

C. Authorized Methods of Disposal of Treated Groundwater

1. Treated groundwater may be disposed of by subsurface infiltration, injection, surface infiltration, percolation trenches or basins, evaporation ponds, land spreading, spray disposal (e.g., for dust control), and irrigation.
2. Treated groundwater may be discharged to ephemeral drainages that are not waters of the United States. Ephemeral drainages are naturally formed non-perennial water drainage features that convey the flow of stormwater across land during precipitation events within a specific watershed and have the potential to be hydrologically connected to the site-specific groundwater basin. If discharge to an ephemeral drainage is proposed, the Discharger is required to provide evidence of consultation with the United States Army Corps of Engineers to determine that the ephemeral drainage is a not a water of the United States and will not require a Federal Clean Water Act section 404 permit.
3. Discharge of treated groundwater must be limited to the same groundwater basin or an ephemeral drainage above the same groundwater basin from which the polluted groundwater was withdrawn.

## II. APPLICATION AND PERMITTING PROCESS

### A. Coverage Under the General Order

To obtain coverage under this General Order, the Discharger must provide the following:

1. A complete Report of Waste Discharge (ROWD) including a Notice of Intent (NOI) and a Remedial Action Plan (RAP). The NOI and RAP requirements are provided in Attachment B of this General Order;
2. A proposed Monitoring and Reporting Program (MRP) must be included in the RAP, based on Attachment C, incorporated herein by reference;
3. The first annual fee in accordance with the current version of the CCR, Title 23, Division 3, Chapter 9, Waste Discharge Reports and Requirements Article 1 – Fees based upon the project type's TTWQ/CPLX. The check or money order must be made payable to the "State Water Resources Control Board".
4. The discharge of waste must not commence until a Notice of Applicability (NOA) from the Executive Officer that includes a site-specific MRP for the remediation project has been issued to the Discharger.
5. A new discharge (new source) for which coverage under this General Order is being sought requires submittal of an updated ROWD and payment of the annual fee at least 30 days prior to initiation of a new discharge. The discharge must not commence until after receiving the written NOA or until the Lahontan Water Board has issued an individual permit for the discharge.
6. Any Discharger may request to be excluded from coverage under this General Order by applying for individual waste discharge requirements (WDR).

B. Eligibility Determination and Notice of Applicability

1. Upon review of the ROWD, Lahontan Water Board staff will determine if the discharge is eligible for coverage under the General Order and if coverage under the General Order is appropriate. The Executive Officer will issue an NOA and prescribe site-specific MRP requirements when coverage under the General Order has been authorized. The following factors will be considered to determine eligibility for enrollment under the General Order:
  - a. Projects anticipated to increase concentrations of inorganics greater than 10 percent over background concentrations at compliance points are not eligible for coverage under the General Permit.
  - b. The ex-situ remediation techniques will be able to produce water quality that is of equal or better water quality than that of the receiving water.
  - c. For proposed discharges to ephemeral drainages, the Discharger is required to consult with the United States Army Corps of Engineers to determine if the ephemeral drainage is a water of the United States.
    - i. If the US Army Corps of Engineers determines the ephemeral drainage is a water of the US, the applicant is not eligible for enrollment under the General Order.
    - ii. If the US Army Corps of Engineers determines the ephemeral drainage is not a water of the US and will not require a Federal Clean Water Act section 404 permit, those projects are eligible for coverage under the General Order and a copy of the determination from the US Army Corps of Engineers is required to be submitted with the NOI and RAP.

C. Termination of Coverage Under the General Order

Following the determination that the pollutant plume and discharge of waste associated with the remediation project no longer poses a threat to water quality, the Discharger may submit a Request for Termination, included in Attachment D of this General Order. The Discharger must electronically file the request presenting evidence that the project does not pose a threat to water quality prior to remediation system removal and destruction of monitoring/injection wells. Upon review of the Request for Termination, Lahontan Water Board staff will determine if the project no longer presents any threat to water quality and if it is appropriate to terminate coverage. If coverage termination is appropriate, then staff will issue a concurrence letter and require the remediation system be removed and that all monitoring and injection wells are properly destroyed. Upon completion of such tasks, the Discharger will submit a final report detailing well destruction and remediation system removal and site restoration. Termination of coverage under this General Order occurs when the Executive Officer issues a Termination of Coverage letter. Once the General Order is rescinded, discharge of waste will no longer be covered, and no discharge of waste may occur within Lahontan Water Board jurisdiction.

III. FINDINGS

The Lahontan Water Board finds:

A. Purpose of the General Order

1. Numerous unauthorized releases of pollutants including, but not limited to, petroleum hydrocarbons, chlorinated solvents, pesticides, herbicides, heavy metals, and other inorganic contaminants have contaminated groundwater in the Lahontan region.
2. In-situ and ex-situ treatment technologies involving the use of the amendments listed in Attachment A have proven successful at cleaning up harmful constituents in groundwater within and outside of the Lahontan Region.

3. The discharges regulated by this General Order are more appropriately regulated by general WDRs rather than individual WDRs because the Lahontan Water Board regulates many sites using these types of remediation processes, the cleanup of these types of sites is of high priority, the issuance of individual WDRs is time consuming without providing additional benefit, and the types of treatment used result in similar impacts that can reasonably be regulated with general WDRs.
4. The General Order: 1) simplifies the application process; 2) allows more efficient use of Lahontan Water Board staff time; 3) minimizes the time needed for Lahontan Water Board approval of WDRs by enabling the Executive Officer to notify the Discharger of the applicability of the general WDRs rather than presenting each individual WDR to the Board Members of the Lahontan Water Board; 4) preserves water resources by authorizing reinjection of treated groundwater into groundwater basins; and 5) provides a level of protection comparable to site-specific individual WDRs.

B. Authority to Issue General Waste Discharge Requirements

Division 7, section 13263(i), of the CWC authorizes the Lahontan Water Board to prescribe general WDRs for a category of discharges if the Lahontan Water Board finds or determines that all the following criteria apply to the discharges in that category:

1. “The discharges are produced by the same or similar operations.”  
Discharges associated with the General Order are produced by remediation operations (in-situ and ex-situ) that are implemented to protect human health and the environment. Discharges of treated groundwater that meet WQOs are limited to the area in the basin undergoing remediation.
2. “The discharges involve the same or similar types of waste.”  
“Waste”, as defined in CWC, section 13050(d), includes sewage and any and all other waste substances, liquid, solid, gaseous, or

radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal. The wastes involved in groundwater remediation projects include liquid waste (i.e., from well development, groundwater monitoring, and the ex-situ treatment processes), and solid waste (i.e., from well installation, excavation and construction) which must be managed by similar methods. The discharge of wastes from in-situ and ex-situ remediation projects, including the use of amendments and discharge of treated groundwater, has the potential to cause unintended adverse impacts to water quality if the discharges remain unregulated and if an MRP is not established.

3. “The discharges require the same or similar treatment standards.”

In-situ and ex-situ remediation projects are designed to clean up groundwater pollutants to meet WQOs, which requires similar treatment standards. The discharges from the two types of activities (in-situ and ex-situ remediation) must have the same treatment standards because the discharges to land have the potential to affect the groundwater quality in the same manner as injection to the groundwater.

4. “The discharges are more appropriately regulated under general discharge requirements than individual discharge requirements.”

Projects eligible for coverage under the General Order have similar operations and discharge similar waste. The discharges from both types of remediation systems have certain common characteristics (e.g., similar potential impacts from amendments and constituents, disposal techniques, and treatment standards). General WDRs are more appropriate than individual WDRs because the similarity of the discharge types and requirements are more efficiently and consistently regulated by general WDRs than nearly identical individual WDRs. Therefore, the discharges are

more appropriately regulated under general WDRs than individual WDRs.

C. The Basin Plan for the Lahontan Region

The Basin Plan was adopted on March 31, 1995, with subsequent amendments. The Basin Plan designates beneficial uses, establishes WQOs to protect beneficial uses, contains prohibitions, includes implementation plans and policies for protecting waters of the region, and incorporates by reference plans and policies adopted by the State Water Resources Control Board (State Water Board). Pursuant to Water Code section 13263(a), WDRs must implement relevant portions of the Basin Plan and take into consideration the beneficial uses to be protected. This General Order implements the Basin Plan, as amended.

D. Water Quality Standards

The water quality standards are defined as the “beneficial uses” and “water quality objectives” outlined in Chapters 2 and 3 of the Basin Plan. The water quality objectives have been incorporated into the waste discharge requirements outlined under section IV of this General Order and are subject to subsequent Basin Plan amendments. The beneficial uses for groundwaters and surface waters are defined in Findings E and F of this General Order and are subject to subsequent Basin Plan amendments.

E. Beneficial Uses of Groundwater

The Lahontan Water Board established beneficial uses of groundwater for each groundwater basin throughout the region. Designated beneficial uses of groundwater underlying the region are described in Chapter 2 of the Basin Plan and include:

- a) Agricultural water supply (AGR);
- b) Aquaculture (AQUA);
- c) Freshwater replenishment to surface waters (FRSH);
- d) Industrial service supply (IND);

- e) Municipal and domestic water supply (MUN); and
- f) Wildlife Habitat (WILD).

F. Beneficial Uses of Surface Water

The Lahontan Water Board established beneficial uses of surface waters for each hydrologic unit throughout the region. Designated beneficial uses of surface waters underlying the region are described in Chapter 2 of the Basin Plan and include:

- a) Agricultural water supply (AGR);
- b) Aquaculture (AQUA);
- c) Preservation of Biological Habitats of Special Significance (BIOL);
- d) Cold Freshwater Habitat (COLD);
- e) Commercial and Sport Fishing (COMM);
- f) Tribal Tradition and Culture (CUL);
- g) Flood Peak Attenuation/Flood Water Storage (FLD);
- h) Freshwater Replenishment (FRSH);
- i) Groundwater Recharge (GWR);
- j) Industrial Service Supply (IND);
- k) Migration of Aquatic Organisms (MIGR);
- l) Municipal and Domestic Supply (MUN);
- m) Navigation (NAV);
- n) Hydropower Generation (POW);
- o) Industrial Process Supply (PRO);
- p) Rare, Threatened, or Endangered Species (RARE);
- q) Water Contact Recreation (REC-1);
- r) Noncontact Water Recreation (REC-2);



- s) Inland Saline Water Habitat (SAL);
- t) Spawning, Reproduction, and Development (SPWN);
- u) Subsistence Fishing (SUB);
- v) Tribal Subsistence Fishing (T-SUB);
- w) Warm Freshwater Habitat (WARM);
- x) Wildlife Habitat (WILD); and
- y) Water Quality Enhancement (WQE).

G. Waste Discharge Prohibitions

Chapter 4 of the Basin Plan contains waste discharge prohibitions that apply to the entire Lahontan Region. Chapter 4 and 5 of the Basin Plan contain watershed-specific waste discharge prohibitions.

H. California Water Code Section 13267 Considerations

CWC section 13267 provides the Lahontan Water Board with the authority to require technical and monitoring reports. The General Order, the ROWD, the request for termination, and the MRP require the Discharger to submit technical and monitoring reports. The technical and monitoring reports are necessary to determine compliance with the conditions of the General Order and to determine the impacts from discharges, if any, on groundwater and public health. As such, the burden, including costs, of this monitoring bear a reasonable relationship to the need for that information and the benefits to be obtained from that information.

I. California Water Code Section 13241 Considerations

CWC section 13263 states each Regional Board must consider the provisions of section 13241 when prescribing WDRs. Factors to be considered include, but are not limited to, the following:

1. "Past, present and probable beneficial uses of water."

Past, present, and probable beneficial uses of water within the Lahontan Region are described in Chapter 2 of the Basin Plan. There are twenty-two beneficial uses of waters within the Lahontan Region. It is the primary responsibility of the Lahontan Water Board to protect all twenty-two beneficial uses. Prohibitions, provisions, WDRs, and an MRP have been incorporated into the General Order to protect those beneficial uses by regulating the discharges of the waste associated with groundwater remediation projects and requiring routine monitoring of the remediation system and water quality.

2. “Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.”

The Lahontan Region includes over 700 lakes, 3,170 miles of streams, and 19,710 square miles of groundwater basins that are hydrologically disconnected from the Pacific Ocean with drainage to the interior of the region. The climate of the Lahontan Region is considered arid and located generally in a rain shadow of the mountains along the western regional boundary, but precipitation amounts can be high (up to 70 inches annually) at higher elevations due to the orographic lift effect of the Sierra Nevada. Due to the arid nature of the environment, many ephemeral drainages have been formed. Research indicates ephemeral drainages provide maximum groundwater recharge during precipitation events in arid environments. Therefore, discharge of treated groundwater to ephemeral drainages that are not a water of the United States (water of the US) is authorized under this General Order.

The hydrogeologic conditions allow salts and other inorganics to accumulate in some lakes and groundwater basins. Much of the water quality is considered to be high quality; however, impacts by elevated concentrations of constituents due to naturally occurring processes or anthropogenic activities have resulted in some areas.

3. "Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area."

The purpose of the General Order is to regulate discharges of waste associated with in-situ and ex-situ remediation of pollution in groundwater implemented to improve water quality conditions. The assessment of the assimilative capacity of the groundwater basin, background water quality, and salt concentrations and byproducts included in some amendments will result in greater protection of existing and probable future beneficial uses to the maximum benefit of the people of the State of California that are not currently being employed at existing groundwater remediation sites. The requirements and prohibitions included in the General Order formulate a concise strategy for the Discharger to characterize the site and develop a coordinated plan to control all factors that may affect water quality before the discharge occurs.

4. "Economic considerations."

The General Order is designed to protect water quality while the Discharger remediates groundwater pollutants. Remediation improves the environmental characteristics which indirectly improves quality of life and the economy.

5. "The need for developing housing within the region."

The General Order would not directly affect housing availability in the region. The remediation activities have the potential to clean up contaminated areas that may have been previously prohibited from use for housing in the past.

6. "The need to develop and use recycled water."

Recycled water means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource (CWC, §13050(n)). Coverage under the General Order is limited to treated groundwater that meets cleanup goals for non-

potable uses and must be discharged to the same groundwater basin from which it originated.

J. Antidegradation Policy – Resolution No. 68-16

State Water Board Resolution No. 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California requires that:

*“Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.*

*Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet WDRs which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”*

Waste as defined in the California Water Code, section 13050(d), is sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed, within containers of whatever nature prior to, and for purposes of, disposal.

This General Order authorizes the discharge of waste associated with groundwater remediation activities to the groundwater bodies and ephemeral drainages within the Lahontan Water Board’s jurisdiction. As described in the Basin Plan, each watershed and groundwater basin has its own specific characteristics, water quality objectives and beneficial

uses (water quality standards). Many of these waterbodies are considered high quality under Resolution No. 68-16.

Authorized temporary and short-term degradation is limited to in-situ groundwater remediation projects within a defined treatment zone within the groundwater basin requiring corrective action. Degradation outside the treatment zone is not authorized and the existing high quality must be maintained as a source of drinking water. The temporary degradation is consistent with the maximum benefit to the people of the State because the purpose of the degradation is to accelerate and enhance remediation of groundwater pollution. The restrictions on in-situ groundwater remediation projects set forth in this General Order, including monitoring to ensure protection of water quality, will result in the best practical treatment and control.

Ex-situ groundwater remediation projects are encouraged to promote groundwater recharge through the surface disposal of the treated groundwater to numerous waters of the State including ephemeral drainages (i.e., that are not waters of the United States as discussed above). Dischargers are not authorized to dispose of treated groundwater that contains detectable levels of man-made organic compounds, inorganics and heavy metals above background concentrations, or in a manner that increases naturally occurring water quality constituents above background concentrations, discharges contaminants to the groundwater basin, causes erosion, scouring, flooding, disturbs sensitive habitat, or moves, splits, and otherwise spreads contaminant plume(s). Site maintenance and monitoring is required to determine degradation at the earliest possible instance and confirm the remediation alternative provides the best practicable treatment or control. The water quality of the discharge effluent must be continually monitored prior to disposal and a diversion plan implemented in the event the discharge does not meet cleanup goals.

K. Right to Safe, Clean, Affordable, and Accessible Water

CWC, section 106.3, establishes a state policy that every human being has the right to safe, clean, affordable, and accessible water adequate for

human consumption, cooking, and sanitary purposes and directs state agencies to consider this policy when adopting regulations pertinent to those uses of water. The purpose of this General Order is to regulate the discharges of waste that are intended to restore beneficial uses and compliance with WQOs by reducing and eliminating existing groundwater pollutants. This General Order also has provisions to control the lateral and vertical extent of treatment zones, beyond which, amendment migration is prohibited.

L. California Code of Regulations, Title 27, Considerations

The discharges authorized in this General Order are exempt from the requirements of *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, set forth in CCR, Title 27, section 20005 et seq., which allows a conditional exemption from some or all of the provisions of Title 27.

Pursuant to CCR, Title 27, section 20090(b), discharges of wastewater to land, including but not limited to evaporation ponds or percolation ponds, are exempt from title 27 if the following conditions are met: (1) the Regional Board has issued a WDR; (2) the discharge is in compliance with the Basin Plan, and (3) the wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste. For purposes of this General Order, “wastewater” means treated groundwater that meets cleanup goals. The exemption is based on the following:

1. The Lahontan Water Board is issuing WDRs.
2. The discharge is in compliance with the Basin Plan.
3. The wastewater does not need to be managed as a hazardous waste.

Pursuant to CCR, title 27, section 20090(d), Regional Board remediation requirements are exempt from the State Water Board Resources Control Board (SWRCB) provisions if the activity meets and, continues to meet the following preconditions:

1. The cleanup actions are taken by or at the direction of public agencies to cleanup or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment.
2. Provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to the SWRCB-promulgated sections of Article 2, Subchapter 2, Chapter 3, Subdivision 1 of this division (§20200 et seq.).
3. Remedial actions intended to contain such wastes at the place of release shall implement applicable SWRCB-promulgated provisions of this division to the extent feasible.

M. Groundwater Remedial Goals

Groundwater remedial goals (cleanup goals) are site-specific numeric and narrative water quality standards that are established for the groundwater remediation site. The cleanup goals are based on factors such as assimilative capacity and existing background water quality; therefore, site-specific cleanup goals are more realistically established on a case-by-case basis. Assimilative capacity is the ability for pollutants, including amendment byproducts, to be absorbed by the groundwater basin environment without detrimental effects to water quality and beneficial uses. Background water quality, as defined in the Basin Plan, is the concentrations of constituents in natural waters that are unaffected by waste management practices or contamination/pollution incidents. The cleanup goals approved by the Lahontan Water Board must be included in the NOA.

N. Financial Assurance

The Discharger must maintain adequate financial assurance for known eventualities including operation, maintenance, closure and post-closure of the remediation site, upgrades to the remediation system, and corrective action in the event of an unauthorized release from the

remediation system. A copy of the financial assurance mechanism must be provided with a detailed explanation verifying the amount of funds is sufficient to perform the above-described tasks. Evidence of financial assurance will be required to be reported annually and included in the preliminary and final closure plans. The Discharger must demonstrate in the annual reports that the amount of financial assurance is adequate and to increase the amount of financial assurance, as appropriate for inflation.

O. Permit History

General Board Order No. 6-93-106 was adopted on November 19, 1993 to regulate the discharges of waste to land from a groundwater treatment unit. General Order No. 6-93-106A1 was adopted on September 9, 1999, amending General Order No. 6-93-106 to reflect changes in groundwater contaminant laboratory detection limits and effluent/discharge limitations for total petroleum hydrocarbons, methyl tertiary-butyl ether, and tertiary butyl alcohol. General Order R6T-2004-0015 was adopted on May 24, 2004, to reflect additional changes in groundwater contaminant laboratory detection limits and effluent/discharge limitations for several constituents of concern and to streamline the MRP program. This General Order rescinds the above-mentioned General Orders.

P. Low Threat to Water Quality Discharges to Land

Projects that involve discharges to land with a low threat to water quality are low volume discharges with minimal pollutant concentrations from activities such as well installation/development, clear water discharges, small dewatering projects, inert solid waste disposal, and cooling discharge. Low threat discharges do not involve polluted groundwater. Therefore, low threat discharges are not covered under this General Order. These low threat discharges are covered under General Order WQO-2003-0003-DWQ.



Q. California Environmental Quality Act Compliance (CEQA)

The Lahontan Water Board prepared an Initial Study (IS) pursuant to CEQA Public Resources Code section 21000, et seq. Based on the IS, the Lahontan Water Board prepared a Negative Declaration (ND) concluding that the General Order will have a less than significant effect on the environment and was circulated under State Clearinghouse No. [Number].

R. Notification of Interested Parties

The Lahontan Water Board notified interested agencies and persons of its intent to prescribe General WDRs for the discharges covered under this General Order and provided them with an opportunity to submit written comments and recommendations. Details of the notification are provided in the Fact Sheet.

S. Consideration of Public Comments

The Lahontan Water Board, in a public meeting held on [date], heard and considered all comments pertaining to the proposed General Order. Details of the notification are provided in the Fact Sheet.

**IT IS HEREBY ORDERED** that pursuant to California Water Code sections 13260, 13263 and 13267 that the dischargers covered under this General Order must comply with the following contents and specific requirements as follows.

IV. WASTE DISCHARGE REQUIREMENTS

A. Discharge Requirements for Injection Projects

Amendments and treated groundwater, that meets cleanup goals, are the only authorized wastes that may be injected to the site-specific groundwater basin. The following requirements pertain to those discharges:

1. Injection activities are limited to the basin undergoing remediation.

2. Injection activities must not alter the hydrogeologic and geochemical characteristics of the basin outside the treatment zone.
3. Injection of treated groundwater must not contain concentrations in excess of WQOs, including narrative and numeric, for each monitoring parameter and constituent of concern outside the treatment zone.
4. Injection must occur in a manner that will not increase the lateral or vertical extent of the pollutant plume.

B. Discharges Requirements for Ex-situ Remediation Projects

The following requirements pertain to discharges of treated groundwater to land, including to ephemeral drainages, from ex-situ groundwater remediation projects.

1. The discharge of treated groundwater must not contain concentrations in excess of cleanup goals for each monitoring parameter and constituent of concern.
2. The discharge of treated groundwater must not contain concentrations of man-made organic compounds above the laboratory method detection limit.
3. The discharge of treated groundwater must not increase concentrations of inorganics and heavy metals in the receiving water above background.
4. Discharge to ephemeral drainages must not scour or significantly change the hydrologic function of the drainage.
5. The discharge of treated groundwater must be in a manner that controls runoff, does not cause erosion or scouring and prevents offsite sediment deposition.

6. The discharge of treated groundwater to land must not destabilize (spread, split, move, etc.) the pollutant plume.

C. Groundwater Limitations

1. The injection or discharge of amendments and treated groundwater must not cause a long term or permanent decrease in the assimilative capacity of the receiving water.
2. The Discharger must not cause, under any circumstances, the presence of the following substances or conditions in groundwaters of the Lahontan Region at the designated compliance points above the Basin Plan WQOs.
  - a. Bacteria, Coliform - Groundwaters designated as MUN, the median concentration of coliform organisms, over a seven-day period, must be less than 1.1 Most Probable Number per 100 milliliters (MPN/100 mL).
  - b. Chemical Constituents - Groundwaters must not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of the CCR, Title 22 (with the exception of constituents which already exceed the MCL or SMCL at background locations): table 64431-A of section 64431 (Inorganic Chemicals), table 6444-A of section 64444 (Organic Chemicals), table 64449-A of section 64449 (SMCLs Consumer Acceptance Limits), and table 64449-B of section 64449 (SMCLs -Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect. Groundwaters must not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.
  - c. Radioactivity - Groundwater designated MUN must not contain concentrations of radionuclides in excess of the

limits specified in CCR, Title 22, section 64442, Table 64442, and section 64443, Table 64443, including future changes as the changes take effect.

d. Taste and Odors - Groundwaters must not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses; For groundwaters designated as Municipal or Domestic Supply, at a minimum, concentrations must not exceed adopted SMCLs specified in the CCR, Title 22, section 64449, table 64449-A (SMCLs -Ranges), and table 64449-B (SMCLs -Ranges), including future changes as the changes take effect.

3. The discharge of wastes must not cause the pH of the receiving groundwater at the compliance points, downgradient and outside the treatment and transition zone to exceed WQOs of the groundwater basin.
4. The discharge of wastes must not cause the groundwater to contain concentrations of amendments, byproducts, organics, heavy metals or salts in amounts that adversely affect any designated beneficial use outside the treatment zone.
5. The discharge of wastes shall not cause the remediation-target constituents, including their intermediate degradation products, in groundwater to exceed cleanup levels outside the treatment zone.
6. The discharge of wastes must be consistent with any Salt and Nutrient Management Plan developed for the site-specific groundwater basin.

D. Surface Water Limitations

The Discharger must not cause, under any circumstances, the presence of the following substances or conditions in surface waters of the Lahontan Region at the designated compliance points above the Basin Plan WQOs.

1. Ammonia – The neutral, un-ionized ammonia species ( $\text{NH}_3$ ) is highly toxic to freshwater fish. The fraction of toxic  $\text{NH}_3$  to total ammonia species ( $\text{NH}_4^+ + \text{NH}_3$ ) is a function of temperature and pH. Tables 3-1 to 3-4 were derived from USEPA ammonia criteria for freshwater. Ammonia concentrations shall not exceed the values listed for the corresponding conditions in these tables. For temperature and pH values not explicitly in these tables, the most conservative value neighboring the actual value may be used or criteria can be calculated from numerical formulas developed by the USEPA. For one-hour (1h- $\text{NH}_3$ ) and four-day (4d- $\text{NH}_3$ ) unionized ammonia criteria, the following equations apply:

$$1\text{h-NH}_3 = 0.52 \div (\text{FT} \times \text{FPH} \times 2)$$

$$4\text{d-NH}_3 = 0.80 \div (\text{FT} \times \text{FPH} \times \text{RATIO})$$

where:

$$\text{FT} = 10^{[0.03(20-\text{TCAP})]}$$

for:  $\text{TCAP} \leq T \leq 30$

$$\text{FT} = 10^{[0.03(20-T)]}$$

for:  $0 \leq T \leq \text{TCAP}$

$$\text{FPH} = (1 + 10^{(7.4-\text{pH})}) \div 1.25$$

for:  $6.5 \leq \text{pH} \leq 8.0$

$$\text{FPH} = 1$$

for:  $8.0 \leq \text{pH} \leq 9.0$

$$\text{RATIO} = 20.25 \times (10^{(7.7-\text{pH})}) \div (1 + 10^{(7.4-\text{pH})})$$

for:  $6.5 \leq \text{pH} \leq 7.7$

$$\text{RATIO} = 13.5$$

for:  $7.7 \leq \text{pH} \leq 9.0$

and:

T = temperature in °C

TCAP = temperature cap in °C

For 1h-NH<sub>3</sub>, TCAP is 20°C with salmonids present and 25°C with salmonids absent. For 4d-NH<sub>3</sub>, TCAP is 15°C with salmonids present and 20°C with salmonids absent.

For interpolation of total ammonia (NH<sub>4</sub><sup>+</sup> + NH<sub>3</sub>) criteria, the following equations can be used:

$$n_{1h} = 1h\text{-NH}_3 \div f, \text{ or } n_{4d} = 4d\text{-NH}_3 \div f$$

where:

n<sub>1h</sub> is the one-hour criteria for total ammonia species (NH<sub>4</sub><sup>+</sup> + NH<sub>3</sub>)

n<sub>4d</sub> is the four-day criteria for total ammonia species (NH<sub>4</sub><sup>+</sup> + NH<sub>3</sub>)

$$f = 1 \div (10^{(pK_a - pH)} + 1)$$

$$pK_a = 0.0901821 + [2729.92 \div (T + 273.15)]$$

and:

pK<sub>a</sub> is the negative log of the equilibrium constant for the NH<sub>4</sub><sup>+</sup> ⇌ NH<sub>3</sub> + H<sup>+</sup> reaction

f is the fraction of unionized ammonia to total ammonia species: [NH<sub>3</sub> ÷ (NH<sub>4</sub><sup>+</sup> + NH<sub>3</sub>)]

Values outside of the ranges 0-30°C or pH 6.5-9.0 cannot be extrapolated from these relationships. Site-specific objectives must be developed for these conditions. A microcomputer spreadsheet to calculate ammonia criteria was developed by Lahontan Water Board staff. An example of output from this program is given in Table 3-5. Contact the Lahontan Water Board if a copy is desired.

2. Bacteria, Coliform – Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes. The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples

collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

3. Biostimulatory Substances – Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.
4. Chemical Constituents – Water designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), Table 64444-A of Section 64444 (Organic Chemicals), Table 64449-A of Section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and Table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels-Ranges). This incorporation by-reference is prospective including future changes to the incorporated provisions as the changes take effect. Waters designated as AGR shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes). Waters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.
5. Chlorine, Total Residual – For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.
6. Color – Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.

7. Dissolved Oxygen – The dissolved oxygen concentration, as percent saturation, shall not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation. For waters with the beneficial uses of COLD, COLD with SPWN, WARM, and WARM with SPWN, the minimum dissolved oxygen concentration shall not be less than that specified in Table 3-6.
8. Floating Materials – Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses. For natural high-quality waters, the concentrations of floating material shall not be altered to the extent that such alterations are discernable at the 10 percent significance level.
9. Oil and Grease – Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses. For natural high-quality waters, the concentration of oils, greases, or other film or coat generating substances shall not be altered.
10. Nondegradation of Aquatic Communities and Populations – All wetlands shall be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants; or that lead to the presence of undesirable or nuisance aquatic life. All wetlands shall be free from activities that would substantially impair the biological community as it naturally occurs due to physical, chemical and hydrologic processes.
11. pH – In fresh waters with designated beneficial uses of COLD or WARM, changes in normal ambient pH levels shall not exceed 0.5 pH units. For all other waters of the Region, the pH shall not be depressed below 6.5 nor raised above 8.5. The Regional Board recognizes that some waters of the Region may have natural pH levels outside of the 6.5 to 8.5 range. Compliance with the pH objective for these waters will be determined on a case-by-case basis.



12. Radioactivity – Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations, which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.
13. Sediment – The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.
14. Settleable Materials – Water shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high-quality waters, the concentration of settleable materials shall not be raised by more than 0.1 milliliter per liter.
15. Suspended Materials – Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affects the water for beneficial uses. For natural high-quality waters, the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.
16. Taste and Odor – Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. For naturally high-quality waters, the taste and odor shall not be altered.
17. Temperature – The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such an alteration in

temperature does not adversely affect the water for beneficial uses. For waters designated WARM, water temperature shall not be altered by more than five degrees Fahrenheit (5°F) above or below the natural temperature. For waters designated COLD, the temperature shall not be altered. Temperature objectives for COLD interstate waters and WARM interstate waters are as specified in the “Water Quality Control Plan for Control of Temperature in The Coastal and Interstate Waters and Enclosed Bays and Estuaries of California” including any revisions. This plan is summarized in Chapter 6 (Plans and Policies), and included in Appendix B.

18. Toxicity – All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration and/or other appropriate methods as specified by the Regional Board. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for “experimental water” as defined in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, et al. 2012, or subsequent editions).
19. Turbidity – Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

E. Disposal Requirements for Investigation Derived Waste

The following requirements pertain to disposal of investigation derived waste:

1. All investigation derived waste including soil and groundwater must be containerized, characterized, and properly labeled.

2. All containerized waste must be transported from the remediation site with 90 days of waste generation and disposed of at an off-site location authorized to accept the waste.

V. WASTE DISCHARGE PROHIBITIONS

1. The continued discharge of pollutants is prohibited.
2. The application of amendments outside the authorized treatment zone is prohibited.
3. Injection of treated groundwater with concentrations in excess of WQOs, including numeric and narrative, for each monitoring parameter and constituent of concern is prohibited outside the treatment zone.
4. Discharges of treated groundwater with concentrations of man-made organic compounds above the laboratory method detection limit is prohibited.
5. Treated groundwater and amendments discharged to all authorized sites must not contain trace elements, pollutants or contaminants, or combinations thereof in concentrations that are toxic or harmful to humans or to aquatic or terrestrial plant or animal life.
6. The discharge of untreated sewage, garbage, other solid wastes, or liquid wastes waste not covered under this General Order into surface waters, including to ephemeral drainages, is prohibited.
7. Discharges of treated groundwater to land by crop irrigation containing nutrients above crop agronomic rates is prohibited.
8. The discharge of waste that causes a violation of any narrative WQO contained in the Basin Plan is prohibited.
9. The discharge of waste that causes a violation of any numeric WQO contained in the Basin Plan is prohibited.
10. Where any numeric or narrative WQO contained in the Basin Plan is already being violated, the discharge of waste that causes further degradation or pollution is prohibited.

11. The exceedance of water quality standards for the site-specific hydrologic unit and groundwater basin is prohibited.
12. A long term or permanent decrease in the assimilative capacity of the groundwater basin is prohibited.
13. Remediation projects must not cause or contribute to a condition of pollution as defined in CWC section 13050(l), or nuisance as defined in CWC section 13050(m).
14. Injection of treated groundwater or amendments and disposal of treated groundwater in a manner that spreads, splits, or moves contaminant plume(s) is prohibited.
15. The injection of waste produced as a byproduct of the treatment process is prohibited, with the exception of treated groundwater that meets cleanup goals. Discharge of waste classified as 'hazardous' under CCR, Title 23, Chapter 15, Section 2521, or 'designated', as defined in CWC, Section 13173 is prohibited.
16. The overflow of wastes from the disposal system is prohibited.
17. Spills of wastes outside the treatment or disposal system are prohibited.
18. The disposal of wastes to property that is not an authorized part of the remediation project is prohibited.
19. The discharge of wastes to waters of the United States is prohibited.
20. The discharge of wastes to waters of the State that are perennial and discharges to wetlands are prohibited.
21. The discharge of wastes in a manner that causes runoff, off-site sediment deposition or that causes or could cause erosion, scouring or flooding is prohibited.
22. Adequate stormwater control facilities must be provided to divert storm water away from the application area, treatment system, and waste storage areas to protect against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from the maximum historic rain or flooding event.

## VI. MONITORING AND REPORTING PROGRAM PROVISIONS

Pursuant to CWC, section 13267, the Discharger is required to establish an MRP. An MRP must be proposed and submitted with the RAP that includes the basic MRP provisions below and the specific requirements for each remediation type outlined in Attachment C. Other site-specific MRP requirements will be addressed during review of the RAP by Lahontan Water Board staff. The MRP will be approved and then issued with the NOA by the Executive Officer providing coverage under the General Order. The basic MRP provisions for each enrollee are provided below.

- A. All technical reports required that involve planning, investigation, evaluation, design, or other work requiring interpretation or application of engineering or geologic sciences, must be prepared by, or under the direction of, persons qualified to conduct this work and registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835 and 7835.1. To demonstrate compliance with CCR, title 16, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) such that all work can be clearly attributed to the professional(s) responsible for the work.
- B. All sampling and sample preservation must be conducted according to approved quality assurance and quality control procedures to prevent cross contamination, meet laboratory hold times, and maintain adequate chain of custody procedures.
- C. All chemical, bacteriological, and bioassay analyses must be conducted by a laboratory certified for such analyses by the California Environmental Laboratory Accreditation Program (ELAP) or other state program authorized to undertake such certification.
- D. The Discharger must submit technical reports to the Lahontan Water Board documenting the work conducted according to the site-specific MRP program and other reports as required by the Executive Officer.

- E. When reporting, the Discharger must arrange all data in tabular form so that the date, constituents, and concentrations are readily discernible. The data must be summarized to demonstrate compliance with the discharge specifications and provisions of the General Order and identify incidents of non-compliance. Laboratory analytical data from any vadose zone and groundwater monitoring must be reported in Electronic Deliverable Format™ in accordance with CCR, title 23, section 3893.
- F. The Discharger must retain records of all monitoring information including copies of all reports required by this General Order, records of all data used to complete the application for this General Order, all calibration and maintenance records, sampling and measurement data including the date, exact location and time of sampling or measurement, individual(s) who conducted the sampling or measurement, the date the analyses were completed, analysts names and analytical techniques/methods used. Records must be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period may be extended during any unresolved litigation regarding the discharge or when requested by the Lahontan Water Board.
- G. The Discharger must submit a written report of any non-compliance with the requirements of this General Order to the Lahontan Water Board within five (5) days of identifying the non-compliance. The written report must identify the date(s) and time of the non-compliance, cause of the non-compliance, and a timetable of the corrective actions, undertaken or proposed, that will bring the discharge into full compliance as soon as possible.
- H. In the event the Discharger is unable to comply with the conditions of this General Order due to any of the following reasons, the discharger must notify the Lahontan Water Board by telephone within 24 hours followed by written notification within 5 business days:
1. Breakdown of remediation treatment equipment,
  2. Accident caused by human error or negligence,
  3. Site construction or development operations; or,
  4. Other causes such as acts of nature.

- I. The Discharger must notify the Lahontan Water Board by telephone within 24 hours of any adverse condition resulting from the discharge; such verbal notification must be confirmed in writing within 5 business days.
- J. The Discharger must submit a revised NOI and RAP to the Lahontan Water Board documenting any material change or proposed change in the character, location, or volume of the discharge.
- K. Whenever investigation derived wastes, including contaminated liquid and solid wastes, are transported offsite for disposal, the following must be documented in the monitoring report corresponding to the period of disposal: type and quantity of waste(s); name and address of the hauler; location of the final point(s) of disposal; waste profiling analytical report(s); and legible copies of any applicable bill of lading, waste manifest, and receipt.
- L. Each monitoring report must contain the following declaration:

"All analyses were conducted by an ELAP-certified laboratory qualified to perform such analyses by and in accordance with current USEPA procedures or as specified in this Monitoring and Reporting Program."

VII. STANDARD PROVISIONS

- A. SOURCE CONTROL: Source control must be implemented at the remedial site as needed to control past and future discharges of pollutants to the environment.
- B. ENFORCEMENT: The Lahontan Water Board may initiate enforcement action against the Discharger should the discharge of waste be in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code section 13050.
- C. DUTY TO COMPLY: The Discharger must comply with all conditions of this General Order and implement the measures identified in the RAP and MRP as approved by the Executive Officer in the NOA. Any noncompliance with this General Order or MRP constitutes a violation of the CWC and is grounds for: 1) enforcement action; 2) termination,

revocation and reissuance, or modification of this General Order; or 3) denial of the ROWD in application for new or revised WDRs.

- D. OTHER REGULATORY REQUIREMENTS: Obtaining coverage under this General Order does not alleviate the Discharger of the responsibility to obtain all other applicable local, state, and federal permits to construct and operate remediation systems and facilities necessary for compliance with this General Order; nor does this General Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency.
- E. ENTRY AND INSPECTION: The Discharger must allow the Lahontan Water Board, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to do the following:
1. To enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this General Order.
  2. Have physical access to and copy, at reasonable times, any records relating to the discharge or relating to compliance with this General Order.
  3. Inspect monitoring and control equipment, practices, or operations regulated or required under this General Order.
  4. Sample or monitor the substances or parameters at any location for purposes of assuring compliance with this General Order or as otherwise authorized by the CWC.
- F. PROPERTY RIGHTS: The General Order does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations, nor create a vested right for the Discharger to continue a waste discharge.
- G. PUBLIC ACCESS: General public access must be effectively excluded from the remediation system facilities.



- H. CIVIL MONETARY REMEDIES: The CWC provides that any person who intentionally or negligently violates WDRs issued, reissued, or amended by the Lahontan Water Board must be liable civilly in accordance with CWC section 13350 (d), (e), or (f).
- I. PENALTIES FOR INVESTIGATION, MONITORING OR INSPECTION VIOLATIONS: The CWC provides that any person failing or refusing to furnish technical or monitoring program reports, as required under this General Order or the NOA, or falsifying any information provided in the monitoring reports is guilty of a misdemeanor and is subject to a civil liability in accordance with CWC section 13268.
- J. ENDANGERMENT OF HEALTH AND ENVIRONMENT: The Discharger must report any noncompliance that may endanger health or the environment. Any such information must be provided orally to the Lahontan Water Board within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission must also be provided within 5 days of the time the Discharger becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Lahontan Water Board, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.
- K. PRIOR NOTICE OF BYPASS: If a need for a discharge bypass is known in advance, the Discharger must submit prior notice (stating, at minimum, the purpose, anticipated dates, duration, level of treatment, and volume of bypass) and if at all possible, such notice must be submitted at least 10 days prior to the date of the bypass. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility to other than a sewer system.
- L. CORRECTIVE ACTION: The Discharger must take all reasonable steps to minimize or correct any adverse impact on the environment resulting

from noncompliance with this General Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

- M. PROPER OPERATION AND MAINTENANCE: The Discharger must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the General Order. Proper operation and maintenance include adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the General Order.
- N. TREATMENT FAILURE: In an enforcement action, that halting or reducing the permitted activity would have been necessary to maintain compliance with this General Order must not be a defense for the Discharger. Upon reduction, loss, or failure of the treatment facility, the Discharger must, to the extent necessary to maintain compliance with this General Order, control production or all discharges, or both, until the facility is restored, or an alternative method of treatment is provided. This provision applies for example, when the primary source of power of the treatment facility is failed, reduced, or lost.
- O. HAZARDOUS RELEASES: Any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State or on land, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, must immediately notify the local health officer or the director of environmental health in accordance with California Health and Safety Code section 5411.5 and the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with section 8574.7) of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the Lahontan Water Board of the discharge as soon as (a) the person has knowledge of the

discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures.

- P. PETROLEUM RELEASES: Any person who, without regard to intent or negligence, causes or permits any oil petroleum product to be discharge in or on any waters of the State or on land, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, must, as or on land, must immediately notify the local health officer or the director of environmental health in accordance with California Health and Safety Code section 5411.5 and the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with section 8574.7) of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the Lahontan Water Board of the discharge as soon as (a) the person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures.
- Q. ORDER REPOSITORY: A copy of this General Order must always be maintained at the Discharger's facility and be available to operating personnel.
- R. AUTHORITY OF THE EXECUTIVE OFFICER: The Executive Officer is delegated the authority to:
1. Update the list of amendments in Attachment A by adding materials that are proven effective to remediate targeted constituents.
  2. Prescribe a site-specific MRP program for each authorized discharger and to require the discharger to submit technical reports associated with the project pursuant to the CWC, section 13267. The program may include participation in a regional monitoring program.
  3. Revoke coverage under this General Order at any time upon giving written notice to the discharger.

- S. ORDER REVISION: Coverage under this General Order may be modified, revoked and reissued, or terminated for cause including, but not limited to the following:
1. Violation of any terms or conditions of this General Order.
  2. Obtaining the General Order by misrepresentation or failure to disclose fully all relevant facts.
  3. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
- T. CHANGE IN DISCHARGE: Pursuant to CWC section 13260(c), any proposed material changes in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, requires submittal of an updated NOI and RAP and payment of the annual fee at least 30 days prior to initiation of a new discharge. This must include, but not be limited to, all significant soil disturbances, construction of groundwater monitoring or injection wells, changes in amendments, volume of discharge, or discharge location.
- U. CHANGE IN OWNERSHIP: This General Order is not transferable to any person except after notice to the Lahontan Water Board. The Discharger must submit a notice in writing at least 30 days in advance of any changes in facility operation including site operator, billing contact, facility owner and landowner. The notice must include a copy of the written agreement between the existing and new owner containing a specific date for the transfer of this General Order's responsibility and coverage between the current Discharger and the new owner. The Lahontan Water Board may require modification or revocation and reissuance of the NOA to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWC.
- V. INCOMPLETE REPORTS: Where the Discharger becomes aware that it failed to submit any relevant facts in a ROWD or submitted incorrect information in a ROWD or in any report to the Lahontan Water Board, it must promptly submit such facts or information.

W. REPORT DECLARATION: All applications, reports, or information submitted to the Lahontan Water Board must be signed and certified as follows:

1. The ROWD must be signed and stamped by either a principal Executive Officer, a California-licensed Professional Engineer (Civil) or Professional Geologist or ranking elected official.
2. All other reports required by this General Order and other information required by the Lahontan Water Board must be signed by a person designated in paragraph (1.) of this provision, or by a duly authorized representative of that person. An individual is a duly authorized representative only if all the following are true:
  - i. The authorization is made in writing by a person described in paragraph (1.) of this provision.
  - ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity.
  - iii. The written authorization is submitted to the Lahontan Water Board.
3. Any person signing a document under this section must make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”

X. GENERAL REPORTING REQUIREMENT: The Discharger must furnish to the Lahontan Water Board, within a reasonable time, any information which the Lahontan Water Board may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating this

General Order. The Discharger must also furnish to the Lahontan Water Board, upon request, copies of record required to be kept by this General Order.

- Y. ELECTRONIC REPORTING REQUIREMENTS: Pursuant to Title 23, section 3893, CCR, all technical reports, laboratory analytical results (soil, soil vapor, groundwater, influent and effluent), groundwater monitoring well and injection well survey data, site maps, groundwater monitoring and injection well construction logs, boring logs, and depth to groundwater must be uploaded electronically over the internet to the State Water Resources Control Board GeoTracker website.
- Z. SEVERABILITY: Provisions of the General Order are severable. If any provision of the requirements is found invalid, the remainder of the requirements must not be affected.
- AA. RESCISSION OF OTHER GENERAL WDRS: General Board Order 6-93-106, 6-93-106A1, and R6T-2004-0015, are hereby rescinded.

VIII. CERTIFICATION

I, Michael R. Plaziak, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a General Order adopted by the California Regional Water Quality Control Board, Lahontan Region, on [MONTH DAY, 2022].

\_\_\_\_\_  
MICHAEL R. PLAZIAK, P.G.  
EXECUTIVE OFFICER  
Lahontan Regional Water Quality Control Board

\_\_\_\_\_  
Date

**ATTACHMENT A**  
**LIST OF AUTHORIZED AMENDMENTS**  
**GENERAL ORDER R6-2022-TENTATIVE**  
**FOR**  
**IN-SITU AND EX-SITU GROUNDWATER REMEDIATION PROJECTS**

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The list below does not represent any endorsement of products or materials by the California Regional Water Quality Control Board, Lahontan Region (Lahontan Water Board). Many of the products/materials listed are patented. Users of these products/materials must comply with any regulations and laws applicable to the use of the products/materials. Some products/materials may contain byproducts or impurities that the Lahontan Water Board does not authorize to be used. Compounds listed under one category can also be used under another category.

1. Chemical Oxidants

Fenton's reagent  
Hydrogen peroxide  
Ferrous iron catalyst  
pH buffer  
Hydrogen peroxide  
Ozone  
Potassium permanganate  
Potassium persulfate  
Sodium percarbonate  
Sodium permanganate  
Sodium persulfate

2. Chemical Oxidant Activators

Calcium hydroxide  
Chelating agents  
Ferric ethylenediaminetetraacetic acid (EDTA)

Sodium citrate  
Sodium malonate  
Sodium phytate  
Silica and silicates  
Silicic acid  
Sodium silicate  
Silica gel  
Sodium hydroxide

3. Aerobic Bioremediation Enhancement Compounds

Calcium oxide/peroxide  
Calcium oxyhydroxide  
Magnesium  
Oxide/hydroxide/peroxide  
Methane (dissolved phase)  
Propane (dissolved phase)

4. Anaerobic Degradation Enhancement Compounds

Ammonium chloride  
Ammonium nitrate  
Ammonium sulfate  
Calcium sulfate  
Gypsum  
Cheese whey  
Complex organic materials  
Starch  
Wood chips  
Yeast extract  
Grain milling products  
Chitin  
Compost  
Complex sugars  
Corn syrup  
Disodium phosphate  
Emulsified vegetable oil



Ethanol  
Glucose  
Glycerol esters of fatty acids and polylactates  
Glycerol poly(lactate)/tripoly(lactate)  
Glycerol, xylitol, sorbitol  
Guar  
Hematite  
Lactose  
Lecithin  
Magnesium sulfate  
Milk whey  
Methanol  
Molasses  
Monosodium phosphate  
Nitrous oxide  
Organic acids (acetate, lactate, propionate, benzoate, and oleate)  
Orthophosphoric salts  
Phosphoric acid  
Polyphosphate salts  
Potassium phosphate  
Potassium sulfate  
Propanol  
Sodium trimetaphosphate  
Sorbitol cysteinate/cysteine  
Triethyl phosphate

5. Reduction Degradation Enhancement Compounds

Ferrous chloride  
Ferrous gluconate  
Ferrous sulfate  
Sodium dithionite  
Zero-valent iron

6. Metals Precipitation/Stabilization

Calcium phosphate

Calcium polysulfide  
Ferrous sulfate  
Sodium tripolyphosphate (STPP)

7. Sorption/Biodegradation Biomatrix

Liquid activated carbon

8. Surfactants/Co-solvents

Benzenesulfonic acid  
Dioctyl sodium sulfosuccinate  
D-limonene  
Ethoxylated castor oils surfactants  
Ethoxylated cocamides surfactants  
Ethoxylated coco fatty acid surfactants  
Ethoxylated octylphenolic surfactants  
Sorbitan monooleate  
Xanthan gum

9. Bioaugmentation Organisms

*The Discharger must prove that any bacterial genomes in original injection form, its degradation form, impurities, or byproduct must not be human/animal pathogens. Genetically modified organisms (GMO) must not be used.*

Dehalococcoides spp.  
Dehalobacter spp.  
Geobacter  
Methanomethylovorans  
Desulfovibrio  
Desulfobacterium

10. Tracer Study Compounds

*The tracer compounds must be highly contrasting and not reactive with current contaminants to be treated. The tracers may be chloride-, bromide-, or fluoride-based salts, or similar materials as approved by the Executive Officer.*

Calcium bromide  
Calcium chloride  
Eosin dyes  
Fluoride salts  
Iodide  
Potassium bromide  
Potassium iodide  
Sodium bromide  
Sodium chloride  
Sodium fluorescein

11. Buffer Solutions and pH Adjusters

Calcium carbonate  
Calcium magnesium carbonate  
Potassium bicarbonate  
Sodium (carbonate/bicarbonate)

12. Biofouling Control Agents

Chlorine dioxide  
Calcium hypochlorite  
Sodium hypochlorite  
Hydroxyacetic acid  
Sulfamic acid  
Acetic acid  
Glycolic acid

13. Adsorption Injectants

Organic Carbon Products

**ATTACHMENT B**

**NOTICE OF INTENT AND REMEDIAL ACTION PLAN REQUIREMENTS**

**GENERAL ORDER NO. R6-2022-TENTATIVE**

**FOR**

**IN-SITU AND EX-SITU GROUNDWATER REMEDIATION PROJECTS**

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All requested information is required – Please type or print clearly in ink

Mark Only One Item	
1.	<input type="checkbox"/> New Discharge [ <input type="checkbox"/> In-situ or <input type="checkbox"/> Ex-situ or <input type="checkbox"/> Small Scale Ex-situ]
2.	<input type="checkbox"/> Change in Discharge [Revised RAP Required]
3.	<input type="checkbox"/> Change of Contact Information – WDID Number:

**Landowner Contact Information**

Name
Mailing Address
Phone Number
Contact Person

**Facility Owner Contact Information**

Name
Mailing Address
Phone Number
Contact Person

**Billing Information**

Name
Mailing Address
Phone Number
Contact Person

**Site Operator**

Name
Mailing Address
Phone Number
Contact Person

**Project Location**

Street Address
City/County
Nearest Cross Street(s)
Total Size of Project (acres)
Latitude/Longitude (from center)
Township/Range/Section
Accessor Parcel Number

**Discharge Information**

Project Type <sup>1</sup>
Amendment Type(s) and Byproduct <sup>2</sup>
Method of Discharge <sup>3</sup>
Volume of Discharge (Gal/day, gal)
Pollutants/Constituents Present in the Discharge and Approximate Concentration (mg/L)
Land Use Zone
Adjacent Land Use Zone

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<sup>1</sup> - See section I.A of General Order No. R6-2022-TENTATIVE

<sup>2</sup> - See Attachment A of General Order No. R6-2022-TENTATIVE

<sup>3</sup> - See section I.C of General Order No. R6-2022-TENTATIVE

## Remedial Action Plan Requirements

Dischargers must submit a RAP with submittal of the NOI. At a minimum, the RAP must comply with the requirements of any applicable Cleanup and Abatement Order or Health and Safety Code Order issued by the Lahontan Regional Water Quality Control Board (Lahontan Water Board) and must be signed and stamped by an appropriately experienced California-licensed Civil Engineer or Geologist. Items to be included in the RAP include:

### PROJECT DESCRIPTION

A detailed description of the project including the following:

- a. Purpose of the project, project type (see General Order R6-2022-TENTATIVE section I for details), and proposed time schedule to implement and complete the project.
- b. A description of the source control measures implemented at the site.
- c. A list of the pollutants and a narrative and graphical representation of the vertical and lateral extent of pollutants in the vadose zone and groundwater including plume (iso-concentration contour) maps and cross sections for contaminants in all affected subsurface and groundwater basin zones.
- d. The vertical and lateral extent of the treatment zone and zone of distribution to be used for the remediation project. Treatment zone is defined as the three-dimensional area being targeted to receive authorized amendments to achieve cleanup goals and protect beneficial uses. Zone of distribution is defined as the lateral and vertical spaces beyond the treatment zone in which the amendment and byproducts of the reactions with the pollutant of concern and background groundwater geochemistry could migrate, either through physical advection or chemical diffusion processes.
- e. A list of amendments to be used for the remediation project, copies of referenced pilot studies (if applicable) and a detailed description of the mechanism for the reaction.
- f. An evaluation of the salt concentrations and byproducts included in the proposed amendment(s). An examination of the potential to produce and

mobilize naturally occurring constituents such as chromium (VI) and other metals, salts, nutrients, etc.

- g. An evaluation of application rate(s) and concentrations for proposed amendment(s) including nitrogen compounds, total dissolved solids, sulfate, chloride compounds, and any other proposed amendments with respect to employing hydraulic control to maintain cleanup goals.
- h. The volume/rate of amendments to be discharged and the radius of influence.
- i. The Safety Data Sheet for all amendments and byproducts.
- j. Site-specific and generally available information about the potential for adverse impacts to groundwater quality due to the application of the proposed amendment and an evaluation of the persistence and mobility of any pollutant breakdown products and amendment degradation byproducts.
- k. Evidence that groundwater gradient, seepage velocity and flow direction have been determined.
- l. Hydraulic control(s) to be employed to ensure WQOs will not be violated at compliance points.
- m. Demonstration that sufficient drawdown by ex-situ remediation activities will result to establish adequate capture zones.
- n. A list and explanation of the proposed equipment including injection wells, extraction wells, groundwater monitoring wells, and all above ground and below ground piping and utilities. Identify the wells to be used to determine water quality upgradient, within, and at compliance points outside (i.e. downgradient) of the treatment zone and within the transition zone.
- o. Chemical and physical characteristics of the proposed discharge water quality.
- p. A description of disposal method(s) and location(s) for treated groundwater.
- q. The proposed siting and construction of the structure(s) which will house chemicals, remediation equipment and other related equipment with consideration for health hazards, security, accessibility, noise, odor control, etc.
- r. Remediation system operation requirements.

- s. A demonstration that the proposed remediation technology is effective in remediating the site-specific constituents which are the subject of the remediation, such as the results of any pilot or bench scale testing performed for the proposed treatment technology.
- t. An evaluation of the cleanup levels that can be achieved at the site by the proposed treatment process.
- u. Site map of the proposed remediation project. The site map must include the following items at minimum:
  - i. Property boundary and Assessor Parcel Number;
  - ii. Polluted zone;
  - iii. Treatment zone;
  - iv. Transition zone;
  - v. Discharge locations;
  - vi. Existing and proposed locations of the groundwater and vadose zone monitoring network including a graphical depiction of the direction and gradient of groundwater flow;
  - vii. Location of the remediation system including injection wells, extraction wells, and remediation equipment housing structures;
  - viii. All streams (denote whether ephemeral, intermittent, or perennial) and wetlands.
  - ix. Schematic of all buried utilities and other preferential flow paths.
  - x. Locations of features within one mile of the site area that may influence the proposed remediation, such as limits of waste for all landfills, surface impoundments, composting piles, agricultural fields, dairies, existing known contaminant/pollutant plumes, and other groundwater monitoring, domestic supply and public supply wells.
  - xi. A north arrow and scale bar.



## MONITORING AND REPORTING PROGRAM

A monitoring and reporting program (MRP) that will adequately assess the effectiveness of the project management measures to prevent impacts to the quality and beneficial uses of the groundwater downgradient of the contaminant plume. An MRP template that may be used by Lahontan Water Board staff is included in Attachment C for reference. The proposed MRP must include the following at minimum:

- a. A summary of the MRP history conducted to adequately establish water quality trends.
- b. Groundwater well construction details for all existing wells to be included in the remediation project.
- c. A figure indicating the location of the treatment zone, transition zone, compliance points, monitoring wells, injection wells/trenches, extraction wells, treated groundwater (effluent) disposal locations, direction of groundwater flow, topography and surface water features including ephemeral drainages.
- d. A list of wells (including well number/name) included in the remediation project and identify the objective for each well listed (i.e., compliance, background, injection, extraction, treatment zone, and transition zone).
- e. A list of constituents of concern (COCs) including the pollutants, amendment(s), breakdown constituents, and byproducts of the amendment(s) that can be expected in groundwater and in effluent.
- f. A Groundwater Sampling and Analysis Plan that includes the sampling locations, sampling frequency for each monitoring parameter and COC, sample collection methods, and quality assurance/quality control measures that will be implemented.
- g. An Effluent Sampling and Analysis Plan that includes the volume of treated groundwater discharged, the method of discharge, discharge locations, sampling locations, sampling frequency for each COC and monitoring parameter, sample collection methods, and quality assurance/quality control measures that will be implemented.

- h. For proposed discharges to ephemeral drainages submit:
  - i. A copy of the determination made by the United States Army Corp of Engineers that the drainage is not a water of the US and does not require a Clean Water Act section 404 permit.
  - ii. A Surface Water Monitoring plan for those projects that have the potential to discharge to any surface water during a precipitation event.
  - iii. An Ephemeral Drainage Monitoring and Maintenance Plan that includes a time schedule to routinely monitor the drainage and a narrative and graphical description of the best management practices that will be implemented to prevent erosion, scouring, flooding and sediment deposition downstream.
- i. A Treated Groundwater Diversion Plan to divert the treated groundwater that does not meet cleanup goals from ephemeral drainages, irrigation fields, and other sensitive areas to prevent pollution.
- j. The background water quality numerical values for pollutants, heavy metals, and inorganics including pH, electrical conductivity, total dissolved solids, and dissolved oxygen. If background has not been determined, the Discharger must submit a proposal to develop the background concentrations.
- k. A remediation system performance monitoring plan and schedule including: the operation and maintenance of injection wells, extraction wells, monitoring wells, and above ground remediation equipment; methods to measure progress toward cleanup goals including a list of chemical constituents and microbial populations to be monitored and the monitoring locations; the sampling frequency, and the media to be monitored including groundwater, soil, soil gas, air, and effluent.
- l. A rebound monitoring plan and schedule to determine if modifications to the treatments system is warranted to improve performance.
- m. The groundwater reporting frequency.
- n. The provisions outlined in section VI of the General Order must be included.

## BACKGROUND WATER QUALITY

An evaluation of the background water quality of the basin at or near the groundwater remediation site(s) including constituents which are the subject of the remediation, pollutant breakdown products, and amendment degradation byproducts (as applicable); total dissolved solids, sulfates, chlorides, phosphorus, potassium, nitrogen species (NH<sub>4</sub><sup>+</sup>, NO<sub>3</sub><sup>-</sup>, NO<sub>2</sub><sup>-</sup>), iron, arsenic, chromium (III and VI), chemical oxygen demand, biochemical oxygen demand, pH, Title 22 dissolved metals, dissolved oxygen, dissolved carbon dioxide, methane, temperature, conductivity, and oxidation-reduction potential. Provide tabulated laboratory analytical data with a column for comparison of relevant water quality objectives (WQOs) from the Basin Plan, corresponding laboratory reports, and any statistical analysis, if available, to support the evaluation.

## SALT AND NUTRIENT MANAGEMENT AND PROTECTION PLAN

An evaluation of the proposed amendments and byproducts produced as a result of the treatment process that may violate the adopted Salt and Nutrient Management Plan adopted for the site-specific groundwater basin. The evaluation must include the protection strategy that will be implemented to comply with the adopted plan including all additional monitoring measures that will be implemented to ensure such protection.

## WATER QUALITY PROTECTION STANDARD

A Water Quality Protection Standard (WQPS) is required to assure the earliest possible detection of a release from remediation system failure, over application of amendments, effluent with concentration of pollutants above cleanup goals, and other site-specific remedial activities. The WQPS consists of all COCs, the concentration limits for each COCs, the point of compliance, all water quality monitoring points and proposed cleanup goals. Include the methodology for determining the concentration limits for each COC identified.

## PRELIMINARY CLOSURE AND POST-CLOSURE MONITORING AND MAINTENANCE PLAN

A Preliminary Closure and Post-Closure Maintenance Plan (PCPCMP) is required to restore the remediation site to pre-project conditions and conduct routine monitoring of compliance points to ensure cleanup goals have been met and the site does not pose

a threat to human health and the environment prior to acceptance of a request for termination of coverage under the General Order. The PCPCMP must include: a timeline to destroy all groundwater monitoring, extraction, and injection wells; a timeline to remove all remediation equipment and restore the site to pre-project conditions (such as revegetation and recontouring); and a copy of the financial assurance mechanism to ensure operation, monitoring and maintenance of the site throughout the life of the remediation project. The PCPCMP may need to be updated periodically to reflect current conditions at the site.

#### FINANCIAL ASSURANCES FOR OPERATION, MAINTENANCE, CLOSURE AND POST-CLOSURE

Financial Assurance must be provided to ensure adequate funds are available by the Discharger for known eventualities including operation, maintenance, closure and post-closure of the remediation site, upgrades to the remediation system, and corrective action in the event of an unauthorized release from the remediation system. A copy of the financial assurance mechanism must be provided with a detailed explanation verifying the amount of funds is sufficient to perform the above-described tasks. Evidence of financial assurance will be required to be reported annually and included in the preliminary and final closure plans.

#### HYDROLOGIC REPORT

A hydrologic report of site-specific hydrology and hydrogeology of the groundwater basin (lithology and physical parameters including infiltration rate) where remediation and discharge of waste is proposed including natural recharge locations; depth to groundwater; velocity, gradient, and direction of groundwater flow, subsurface media type(s) and range of hydraulic conductivities. The hydrologic report must also include an evaluation of the following hydrologic conditions:

- a. Potential effects on supply wells and nearby contaminant plumes due to groundwater extraction within one mile of the remediation site.
- b. The zone of influence on the contaminant plume from supply wells within one mile of the remediation site.

## SENSITIVE RECEPTOR SURVEY AND PROTECTION PLAN

A Sensitive Receptor Survey and Protection Plan identifying all sensitive receptors and measures to protect sensitive receptors. The document must include all biological resources, cultural resources (including unique paleontological resources), surface waters (including waters of the State and waters of the US), schools, day care centers, residences and water supply wells (municipal and private domestic water supply, agricultural supply, industrial supply, etc.) located onsite and within one mile of the remediation project. Applicants are encouraged to contact the California Historical Resources Information Center for information related to historical resources located at the site of the proposed remediation project. If there is the potential to have a substantial adverse effect on species identified as a candidate, sensitive, or special status species (protected species) in local or regional plans, policies, or regulation, or by the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFW), coordination will be recommended with the applicable agency to avoid impacts prior to qualifying for the General Order.

## HEALTH AND SAFETY PLAN

A Health and Safety Plan (HSP) identifying the amendments, other materials, and wastes being transported to or from the site, and stored and used onsite; possible exposure risks; and the mitigation measures that will be incorporated throughout the life of the project to protect workers and the general public from exposure to hazardous material/hazardous waste.

## REMEDIATION SYSTEM FAILURE CONTINGENCY PLAN

A Remediation System Failure Contingency Plan (RSFCP) must indicate the procedures that will be implemented to respond to any emergencies caused by an unauthorized release due to failure of the remediation system. Mitigation measures to prevent exposure of hazardous material/hazardous waste from a release to land or groundwater must be incorporated to protect human health and the environment. The contingency plan must detail who is responsible for responding to any emergencies, their contact information, and the qualification of responding personnel.

## OPERATIONS AND MAINTENANCE PLAN

An Operations and Maintenance Plan (OMP) addressing the day-to-day activities that will be conducted to monitor the remediation equipment, damage after weather or other events, and prevent unauthorized access to the site.

## STORM WATER MANAGEMENT PLAN

A Storm Water Management Plan (SWMP) identifying measures to control storm water run-on and to limit erosion and migration of materials and waste offsite from storm water run-off. The SWMP must include a site map of existing and proposed storm water control facilities, detailed description of the containment structure(s) construction material, a detailed description of the conveyance systems, and a list of water quality monitoring parameters and constituents of concern. Containment structure refers to any berm, ditch, working surface, detention pond, or other mechanism approved by the Lahontan Water Board at a Remediation Site designed, constructed, and maintained to control and capture stormwater run-on and runoff.

## EMERGENCY RESPONSE PLAN

The Emergency Response Plan (ERP) must include a detailed narrative description of the hazards associated with the remediation project and must include a site map of the project location relative to known geologic hazard zones including earthquake, liquefaction, and flood zones. The ERP must provide the actions that will be taken in the event of an emergency from the remediation project (e.g. unauthorized release) and from a natural disaster from any identified geologic hazards and wildfires.

## IRRIGATION MANAGEMENT PLAN

An Irrigation Management Plan (IMP) must be submitted if the waste is used for irrigation of land used for grazing or irrigation of crops. The IMP components must include the following as applicable:

- a. A detailed description of measures to maintain adequate cover to reduce erosion and sedimentation, rest-rotation grazing strategies, balance the number of animals to the available forage value, increase the use of range riders to improve animal distribution and use of forage, fencing sensitive areas to exclude grazing, develop non-lakeshore and off-stream watering sites, construct

physical improvement projects such as check dams, and restore riparian habitat.

- b. A detailed description of the crop type, irrigation method, volume of water discharged, watering schedule, acreage of application, and a list of compost, manure, fertilizer, pesticides, and herbicides used to include the associated material safety data sheet for each compound.
- c. An evaluation of the crop agronomic rate to balance the amount of water applied and the amount of nutrients removed through crop uptake and measures implemented to minimize leaching past the root zone.
- d. An evaluation of the concentrations of naturally occurring heavy metals and inorganic constituents to include tabulated analytical data and analytical laboratory reports.

**ATTACHMENT C**  
**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**  
**LAHONTAN REGION**

**MONITORING AND REPORTING PROGRAM**  
**NO. R6-2022-TENTATIVE**  
**WDID NO. [Waste Discharge ID #]**

**FOR**

**[NAME OF DISCHARGER]**  
**[NAME OF PROJECT]**  
**[LOCATION]**

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The following Monitoring and Reporting Program (MRP) is a template. The final MRP included with the NOA must be customized by Lahontan Regional Water Quality Control Board (Lahontan Water Board) staff to fit the site-specific needs of the project. Constituents to be sampled, sampling locations, sampling frequency and reporting frequency need to be specified for the project. Attachment A is a generic template and likely constituent lists that need to be modified to meet the site-specific needs. Attachment B is reserved for a Site map. Attachment C is the General Provisions for Monitoring and Reporting. The text in red font is information that can be updated for a complete site-specific MRP.

This Monitoring and Reporting Program (MRP) is issued to [Name of Discharger] for the [name of site and location] (Site), pursuant to Water Code Section 13267, and incorporates requirements for [types of monitoring (i.e., groundwater monitoring, remediation system performance, maintenance, effluent discharge, injection, extraction, reporting, and financial assurances)]. The Discharger must not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, Lahontan Regional Water Quality Control Board (Lahontan Water Board) staff must approve specific sample locations prior to implementation of sampling activities. The technical reports required by General Order No. R6-2022-TENTATIVE and MRP No. R6-2022-TENTATIVE are necessary to ensure compliance with the Waste Discharge Requirements (WDRs). Therefore, the burden, including



costs, of these reports bears a reasonable relationship to the need for the report and the benefits to be obtained from the reports.

I. WATER QUALITY PROTECTION STANDARD

A Water Quality Protection Standard (WQPS) is required to assure the earliest possible detection of a release from the remediation project to the soil and/or groundwater. The WQPS consists of all constituents of concern (COCs), the concentration limits for each COC, the point of compliance, and all water quality monitoring points. The Executive Officer shall review and approve the WQPS, or any modification thereto, for each monitored medium.

A. Constituents of Concern

The COCs include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from the waste discharge [[site specific sources of waste \(i.e., amendments, amendment byproducts, effluent\)](#)]. The COCs for each monitored medium are listed in Attachment A, which is made part of this MRP. The Discharger must monitor all COCs at the sampling frequency and reporting frequency listed in Attachment A, which is made part of this MRP.

B. Monitoring Parameters

Monitoring parameters are those COCs that provide a reliable indication of a release from the remediation system and monitor remediation system performance. The monitoring parameters for each monitored medium are listed in this MRP, Attachment A. The Discharger must monitor all monitoring parameters at the sampling frequency and reporting frequency listed in Attachment A.

C. Concentration Limits

Concentration limits are established for each COC and are intended to reflect background ambient conditions of surface and subsurface media that are unaffected by a release from the remediation system. At any given time, the concentration limit for each COC must be equal to the

background data set of the constituent unless a concentration limit greater than background (CLGB) has been established.

1. The Discharger is using the following methodologies to determine concentration limits for the groundwater monitoring program.
  - a. [Type Of Statistical Analysis – Intrawell or Interwell] – Describe statistical analysis used by the Discharger.
  - b. [Non-Statistical Comparison] – For inorganic COCs either not detected in the background well or only detected at trace concentrations and for man-made organic COCs, the concentration limit is set at method detection limit for the analytical method used.

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the Site, the Discharger may request modification of the WQPS concentration limits to provide seasonal or reason-specific concentration limits (background data sets) for each COC at each monitoring point.

D. Point of Compliance and Monitoring Points

The point of compliance and monitoring points for the [specific media (i.e., groundwater, unsaturated zone, etc.)] are shown on Attachment B of this MRP. The Discharger may add monitoring points, as needed, to comply with the monitoring program.

The point of compliance is [describe point of compliance locations].

E. Compliance Period

The compliance period is the number of years equal to the active life of the remediation project plus any post-closure monitoring and maintenance period until the Lahontan Water Board finds that the Site no longer poses a threat to water quality. The compliance period is the minimum period during which the Discharger must conduct a water

quality monitoring program after a release. The compliance period must begin anew each time the Discharger initiates remedial actions. The compliance period may be extended if the Site is not in compliance with the WQPS.

The Discharger plans to [describe proposed actions to close and restore the site].

## II. MONITORING

The Discharger must comply with the monitoring requirements outlined below. The Discharger must monitor the groundwater and [other monitoring points (i.e., effluent, discharge locations)]. All monitoring and inspection activities must be documented, and all sampling must be conducted in accordance with the approved Sampling and Analysis Plan (SAP) and as described in the General Provisions for Monitoring and Reporting (Attachment C of this MRP).

The Discharger must operate and maintain a monitoring system that complies with the approved Remedial Action Plan (RAP). Monitoring of the groundwater, waste disposal locations, and [other monitoring media] must be conducted to provide the best assurance of an early detection of a release from the groundwater remediation system and impacts to downgradient receptors. Changes to the remediation system requires submittal of an updated Notice of Intent (NOI) and revised RAP.

All samples collected in accordance with this MRP, except for field parameters must be analyzed by a California state-certified laboratory using United States Environmental Protection Agency (USEPA) analytical methods or the most recently approved SW-846 USEPA method or other equivalent USEPA method. An alternate method may be used if acceptable to the Executive Officer.

### A. Point of Compliance Groundwater Monitoring

The groundwater monitoring program monitors the quality of groundwater that passes through the point of compliance as well as monitors the quality of water upgradient, cross-gradient, and downgradient [other compliance monitoring (e.g. treatment zone, transition zone)] of the Site through the collection of groundwater samples for laboratory analysis and

field measurement of water quality parameters. The Discharger must demonstrate the groundwater quality at the compliance points is not being impacted by the discharge.

1. Monitoring Points

Groundwater monitoring points are shown on MRP, Attachment B.

2. Depth to Groundwater

Prior to purging and sampling, the Discharger must measure and record the depth below the ground surface of the static groundwater elevation (feet below ground surface [bgs]) in all groundwater monitoring wells. The measurements must be accurate to the nearest 0.01 foot.

3. Groundwater Purging and Sampling

Prior to sampling, all groundwater monitoring wells must be purged using either standard or low-flow techniques until dissolved oxygen (DO), electrical conductivity, pH, temperature, and turbidity of extracted well water have stabilized. These parameters will be considered stable when three consecutive readings have pH values within +/- 0.1 pH units, temperature values within +/- two (2) degrees Celsius, and electrical conductivity values within +/- three (3) percent.

Field sampling logs must include the stabilization readings, well screen interval, pump location within the well screen interval, type of pump used, and purge rate.

4. Monitoring Parameters and Constituents of Concern

The Discharger must monitor, at each groundwater monitoring well, all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A. Should any non-monitoring parameter COC exceed their respective concentration limit by a measurably significant amount at any given point, that non-

monitoring parameter COC will become a monitoring parameter at that monitoring point.

5. Field Parameters

The Discharger must monitor the groundwater for all field parameters in accordance with the frequencies listed in Attachment A.

6. Aquifer Characteristics

The Discharger must calculate, and illustrate on a site plan and/or aerial photograph, the following aquifer characteristics: the depth to groundwater (feet bgs) in each groundwater monitoring well; the static water level (feet above mean sea level) in each groundwater monitoring well; the slope of the groundwater gradient (feet/feet); the direction of groundwater gradient beneath and around the Site (degrees from true north); the velocity of groundwater flow (feet/year); and the current groundwater elevation isocontours for that monitoring period.

7. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of the field monitoring equipment.

B. In-Situ Remediation Monitoring

The Discharger must monitor the groundwater within the treatment and transition zones through the collection of liquid samples for laboratory analysis, measurement of product thickness, and collection of field monitoring parameters, [other site-specific monitoring]. The Discharger is also responsible for monitoring the volume and type of amendment discharged to the groundwater basin.

1. Amendment Analysis

Prior to use, amendments must be analyzed for the constituents listed in Attachment A. The analysis should be done on a mixture of the amendment and deionized water at the estimated concentration that would be injected during the pilot project.

2. Monitoring Points

The injection and observation well locations are shown on Attachment B.

3. Measure Free Product Thickness and Depth to Groundwater

Prior to purging and sampling, the Discharger must measure and record the free product thickness and depth below the ground surface of the static groundwater elevation (feet below ground surface [bgs]) in all groundwater monitoring wells. The measurements must be accurate to the nearest 0.01 foot.

4. Free Product Removal and Groundwater Purging and Sampling

Prior to purging and sampling, the discharger must remove the free product. After free product removal, all wells must be purged using either standard or low-flow techniques until dissolved oxygen (DO), electrical conductivity, pH, temperature, and turbidity of extracted well water have stabilized. These parameters will be considered stable when three consecutive readings have pH values within +/- 0.1 pH units, temperature values within +/- two (2) degrees Celsius, and electrical conductivity values within +/- three (3) percent.

Field sampling logs must include the stabilization readings, well screen interval, pump location within the well screen interval, type of pump used, and purge rate.

5. Monitoring Parameters and Constituents of Concern

The Discharger must monitor, at each injection and observation well, all COCs and monitoring parameters in accordance with the

frequencies listed in Attachment A. Should any non-monitoring parameter COC exceed their respective concentration limit by a measurably significant amount at any given point, that non-monitoring parameter COC will become a monitoring parameter at that monitoring point.

6. Field Parameters

The Discharger must monitor each well for all field parameters each time a well is sampled in accordance with the frequencies listed in Attachment A.

7. Flow Rate Characteristics

The Discharger must record the following flow rate characteristics of water and amendments that are injected into the groundwater aquifer: injected volume in gallons per day; amendments added in pounds per day; and biocide added in pounds per day [if applicable].

C. Ex-situ Remediation Monitoring

The Discharger must monitor the groundwater extraction system through the collection of liquid samples for laboratory analysis of the influent and effluent, recording the volume of influent to the remediation system, the volume of treated groundwater (effluent) disposed to the authorized disposal areas, inspection of discharge locations [other applicable monitoring].

The following influent, effluent and receiving water monitoring detail the constituents to analyzed and the sampling frequency.

1. Remediation System Startup Monitoring

Prior to disposal of any effluent, the Discharger shall conduct startup monitoring to confirm that the remediation system will produce effluent that complies with standards prescribed in the Waste Discharge Requirements (WDRs). During startup

monitoring, the Discharger must direct the effluent to a temporary impervious storage container. Startup monitoring must be conducted until two consistent, consecutive sample results indicate system stability and compliance with WDRs. Samples must be taken a minimum of twelve (12) hours apart and a maximum of seventy-two (72) hours apart. Only treatment plant effluent is required to be analyzed during startup monitoring.

2. Remediation System Flow Monitoring

The following information must be recorded in a permanent logbook:

- a. The total volume, in gallons, of groundwater extracted for each day.
- b. The total volume, in gallons, of groundwater extracted for each month.
- c. The average flow rate, in gallons per day, of groundwater extracted calculated for each month.
- d. The total volume, in gallons, of effluent to the disposal facility for each month.
- e. If applicable, the freeboard (distance from the top of the lowest part of the dike to the surface impoundment) must be measured each month in each pond. If a pond does not contain effluent, indicate that it is empty.
- f. The remediation system non-operation time in hours of each non-operation period and in total hours of non-operation during the reporting period.

3. Groundwater Extraction System Monitoring

The Discharger must monitor the hydrologic effect on the groundwater basin and the success of the hydraulic containment



implemented to maintain plume stability [other applicable monitoring].

a. Monitoring Points

The extraction wells, observation wells, [other types of hydraulic containment (i.e., pumping, and injection wells)], are shown on Attachment A.

b. Hydraulic Containment

Hydraulic containment is accomplished by [types of hydraulic containment (i.e., capture zone, pressure ridge, physical barrier)]. The Discharger must monitor the following: the hydraulic head, groundwater quality, pumping rates, and volume of water being extracted or injected, [other such as tracer testing].

c. Measure Free Product Thickness and Depth to Groundwater

Prior to purging and sampling, the Discharger must measure and record the free product thickness and depth below the ground surface of the static groundwater elevation (feet below ground surface [bgs]) in all groundwater monitoring wells. The measurements must be accurate to the nearest 0.01 foot.

4. Influent Monitoring

The Discharger must monitor the quality entering the remediation system, [other applicable monitoring].

a. Monitoring Points

The extraction wells are shown on Attachment B.

b. Measure Free Product Thickness and Depth to Groundwater

Prior to purging and sampling, the Discharger must measure and record the free product thickness and depth below the ground surface of the static groundwater elevation (feet below ground surface [bgs]) in all groundwater monitoring wells. The measurements must be accurate to the nearest 0.01 foot.

c. Free Product Removal and Groundwater Purging and Sampling

Prior to purging and sampling, the discharger must remove the free product. After free product removal, all wells must be purged using either standard or low-flow techniques until dissolved oxygen (DO), electrical conductivity, pH, temperature, and turbidity of extracted well water have stabilized. These parameters will be considered stable when three consecutive readings have pH values within +/- 0.1 pH units, temperature values within +/- two (2) degrees Celsius, and electrical conductivity values within +/- three (3) percent.

Field sampling logs must include the stabilization readings, well screen interval, pump location within the well screen interval, type of pump used, and purge rate.

d. Monitoring Parameters and Constituents of Concern

The Discharger must monitor the quality of water being extracted for treatment at the remediation system according to the schedule provided in Attachment A.

e. Field Parameters

The Discharger must monitor each well for all field parameters each time a well is sampled in accordance with the frequencies listed in Attachment A.

5. Effluent Monitoring

The Discharger must monitor the quality and volume of effluent discharged to the [authorized disposal systems (i.e., agricultural fields, groundwater basin via injection, etc.)] through the collection of liquid samples for laboratory analysis. All observations and measurements must be recorded in a permanent logbook kept onsite. Effluent that does not meet the discharge specifications (cleanup goals) must be diverted from groundwater recharge locations such as irrigation fields, percolation ponds, ephemeral drainages, etc.

a. Monitoring Points

The monitoring points are shown on Attachment B. A liquid grab sample will be collected from the treated groundwater conveyance system at a location upgradient from the point of discharge to the [disposal system (i.e., percolation pond, ephemeral drainage, etc.)]. The sample location must be documented for each sampling event.

b. Monitoring Parameters and Constituents of Concern

The Discharger must monitor the treated groundwater for all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A.

c. Field Parameters

The Discharger must monitor treated groundwater for all field parameters in accordance with the frequencies listed in Attachment A.

d. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

6. Disposal Monitoring

The Discharger must monitor the composition of water discharged to the [containment structure] through the collection of liquid and [other applicable media such as soil] for laboratory analysis. All observations and measurements must be recorded in a permanent logbook kept onsite.

a. Monitoring Points

A liquid grab sample must be collected from [discharge location] at a location, as specified herein: [specify locations].

b. Monitoring Parameters and Constituents of Concern

The Discharger must monitor [discharge location] liquids for all monitoring parameters and COCs in accordance with the frequencies listed on Attachment A.

c. Field Parameters

The Discharger must monitor [discharge location] liquids for all field parameters in accordance with the frequencies listed in Attachment A.

d. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

e. Dikes and Liners

The Discharge must visually inspect each dike and exposed liners at a regular frequency (such as daily) to determine if there are any indication of loss of integrity. Should the inspection indicate that any unauthorized discharge has occurred, or may occur, the Discharger must notify the

Lahontan Water Board with 24 hours of the inspection, followed by confirmation in writing within 7 days.

f. Diversion Monitoring

The Discharger must visually inspect the diversion area for the treated groundwater that does not meet cleanup goals. The inspect results must be recorded and kept in a permanent logbook.

7. Ephemeral Drainage Monitoring

The Discharger must monitor the integrity of the ephemeral drainage and monitor the quality of water discharged.

a. Monitoring Points

A liquid grab sample must be collected at a location within the drainage positioned downgradient from the discharge point.

b. Monitoring Parameters and Constituents of Concern

The Discharger must monitor the liquids for all monitoring parameters and COCs in accordance with the frequencies listed on Attachment A.

c. Field Parameters

The Discharger must monitor the liquids for all field parameters in accordance with the frequencies listed in Attachment A.

d. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

e. Ephemeral Drainage Inspections

The Discharger must visually inspect the ephemeral drainage at a regular frequency (such as daily) to determine if there are any indication of loss of integrity, erosion, scouring, and sediment transport downstream. Should the inspection indicate that any unauthorized discharge has occurred, or may occur, the Discharger must notify the Lahontan Water Board with 24 hours of the inspection, followed by confirmation in writing within 7 days.

D. Surface Water Monitoring

The Discharger must implement the surface water monitoring program according the approved RAP that was prepared for those discharges that have the potential to impact waterbodies.

1. Visual Inspections

The Discharge must visually inspect the receiving water according to the approved RAP according to the inspection frequency.

2. Monitoring Points

The monitoring locations are listed on Attachment B.

3. Sampling Locations

The Discharger must sample the locations according to the sampling frequency included in the approved RAP and listed on Attachment A.

4. Monitoring Parameters and Constituents of Concern

The Dischargers must have the surface water samples analyzed for all COCs and monitoring parameters listed on Attachment A.

E. Storm Water Monitoring

The Discharger must monitor storm water discharges according to the approved RAP.

1. Visual Inspections

The Discharger must visually inspect the storm water monitoring locations according the frequency indicated in the approved RAP.

2. Monitoring Points

The monitoring points are included on Attachment B.

3. Sampling Locations

The sampling locations are included on Attachment B.

4. Monitoring Parameters and Constituents of Concern

The monitoring parameters and COCs are those listed on Attachment C.

III. DATA ANALYSIS

All data analysis methods (statistical and non-statistical) must meet the requirements for determining rebound, source control, and remedial progress. [\[Provide site-specific information\]](#).

IV. REPORTING REQUIREMENTS

The Discharger must comply with the following reporting requirements.

A. Scheduled Reports to be Filed with the Lahontan Water Board

Pursuant to CCR, title 23, section 3890 (et al.) the Discharger must submit all the monitoring data and technical reports electronically over the internet to the State Water Resources Control Board's GeoTracker database in Electronic Data Format (EDF). This requirement is in addition to, and not superseded by, any other applicable reporting requirement.

1. Quarterly Monitoring Reports

Each quarterly report must include but not be limited to, the following information.

- a. All data collected during the reporting period in accordance with the approved SAP for the [each monitoring location] as outlined in MRP, section II.
- b. Tabulated results of sampling and laboratory analyses for each monitoring point, including historical (last ten years at minimum) and current reporting period data, as well as the concentration limit for each monitoring parameter and an identification of each sample that exceeds its respective concentration limit at any given monitoring point.
- c. A map and/or aerial photograph showing the perimeters of the remediation system, treatment zone and ancillary facilities as well as locations of monitoring points and background monitoring points, observation stations, and the surface trace of the point of compliance.
- d. Describe, calculate, and illustrate on a map and/or aerial photograph the static groundwater surface elevation (feet above mean sea level) in each groundwater monitoring well, the groundwater gradient (feet/feet) and the direction of the groundwater gradient beneath and around the surface impoundments, the velocity of groundwater flow (feet/year), and the current groundwater isocontours for that monitoring period.
- e. Isoconcentration maps for each COC depicting the aerial extent of the plume from the date the release was identified and compared to current data.
- f. Cross sections of each COC in the subsurface depicting the vertical extent of pollution in the subsurface.



- g. All data and visual observations associated with monitoring of the [monitoring points].
- h. A narrative description of any modifications to, additions to, maintenance of, or operational problems associated with the remediation system and disposal facilities.
- i. Copies of all field monitoring and well sampling data sheets. All sampling data sheets must include the groundwater purge rate and location of the pump within the screened interval.
- j. Time-series plots of the analytical results from [monitored media (i.e., groundwater, etc.)] at each monitoring point for each COC and monitoring point detected during the monitoring period as well as available historical data (last ten years of data). Time-series plots must include as horizontal lines, the concentration limit as derived in accordance with the WQPS for the respective COC/monitoring point pair (if applicable), as well as the PQL and MDL for the analytical method used.
- k. A letter transmitting the essential points of each report, including an analysis of the data collected during the monitoring period with respect to the success of the remediation system.
- l. A discussion of any violations found since the last report was submitted and describing actions taken or planned for correcting those violations.
  - i. If the Discharger has previously submitted a detailed time schedule for correcting violations, a reference to the correspondence transmitting this schedule will suffice.

- ii. If no violations have occurred since the last submittal, this must be stated in the letter of transmittal.
- m. A summary of significant spills and/or leaks that occurred at the Site during the reporting period and must include: 1) the response taken by the Discharger; 2) date of incident; 3) copies of laboratory analytical reports from all samples collected; and 4) photographs taken of the incident.

2. Annual Monitoring Reports

Each annual report must include, but not be limited to, the following.

- a. All data reported in accordance with the MRP, [sections].
- b. A narrative of the items described in the General Provisions for Monitoring and Reporting (Attachment C of this MRP).
- c. Isoconcentration maps for each COC depicting the aerial extent of the plume from the date the release was identified and compared to current recently detected water quality data.
- d. Tabulated water quality data collected during the calendar year. Each table must include the historical and most recently collected water quality data for the monitored medium [e.g., groundwater, influent, effluent, stormwater].
- e. Time-series plots for each monitoring parameter and constituent of concern. Each graph must be plotted using raw data, including the last ten (10) years of data at minimum, and at a scale appropriate to show trends or variations in water quality. For graphs showing trends of similar constituents (e.g., volatile organic compounds) the scale must be the same.

- f. Calibration methods and any discrepancies of any meters used for field parameter evaluations after calibration is performed.
- g. An evaluation of the effectiveness of both the [e.g., groundwater, extraction system, compliance point] monitoring programs and any proposed modifications necessary to improve the detection monitoring.
- h. A summary of significant spills and/or leaks that occurred at the Site during the reporting period and must include: 1) the response taken by the Discharger; 2) date of incident; 3) copies of laboratory analytical reports from all samples collected; and 4) photographs taken of the incident.
- i. A brief chronological summary of dates of any operational problems and maintenance activities that may impact water quality at the site.
- j. The compliance record and the corrective actions taken or planned, which may be needed to bring the Facility into full compliance with the discharge requirements.
- k. Evidence that adequate financial assurance for (1) closure and post-closure monitoring and maintenance and (2) corrective action for all known or reasonably foreseeable releases is still in effect. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument.
- l. Evidence that the financial assurance amount is adequate or increase the amount of financial assurance by an appropriate amount, if necessary, due to inflation, a change in the preliminary closure plan, or other unforeseen events.
- m. The Discharger must review the preliminary closure plan and corrective action plan for all known or reasonably foreseeable releases annually to determine if significant

changes in the operation of the Facility warrant an update to these plans. Any proposed changes to these plans must be outlined in the annual report.

- n. The Discharger has established background concentration limits in the WQPS. These limits may be revised annually. The revised limits must be included in the annual report and approved by the Executive Officer.

### 3. Annual Storm Water Reports

Annual storm water reports must be submitted to the Lahontan Water Board no later than [Date] of each year in accordance with the frequency listed in Attachment A and may be combined with the annual monitoring reports. Annual storm water reports must include, but not be limited to, the following information:

- a. All data collected during the reporting period in accordance with the storm water monitoring plan, as outlined in MRP, [sections].
- b. Tabulated results of sampling and laboratory analyses for each storm water discharge monitoring location, including historical and current reporting period data, as well as the water quality threshold for each monitoring parameter and an identification of each sample that exceeds its respective water quality threshold at any given discharge monitoring location.
- c. A copy of the current site map from the SWPPP.
- d. Copies of all field monitoring, storm water sampling, and visual observation data sheets. An explanation shall be provided in the Annual Report for uncompleted sampling event visual observations.
- e. Calibration methods and any discrepancies of any meters used for field parameter evaluations after calibration is performed.

- f. A summary of the actions taken in response to a water quality threshold exceedance, including monitoring parameter and pollutant source(s) involved, additional BMP and/or SWPPP measures taken, and associated dates and timelines for implementing the response action; or a demonstration that the exceedance(s) is attributed to a non-industrial pollutant source and/or to a natural background source.
- g. A copy of any SWPPP amendments and/or revisions for the reporting period.
- h. A summary of significant spills and/or leaks that occurred at the Facility during the reporting period and the response taken by the Discharger, including dates.
- i. A summary of employee storm water related trainings performed during the reporting period, including dates and content.

B. Unscheduled Reports to be Filed with the Lahontan Water Board

The following reports must be submitted to the Lahontan Water Board as specified below.

1. Notice of Tentative Release from the Facility

Should the statistical or non-statistical data analyses indicate, for a given COC, that a new release is tentatively identified, the Discharger must follow these requirements.

a. Physical or Measurably Significant Evidence of a Release from the WMUs

The Discharger must immediately notify the Lahontan Water Board verbally whenever a determination is made that there is significant physical or “measurably significant” evidence of a release from the [site-specific area]. This verbal notification must be followed by written notification via certified mail within seven days of such determination. Upon such notification, the Discharger may initiate

verification procedures or demonstrate that another source other than the [site-specific source] caused evidence of a release in accordance with this MRP, section [release verification section].

The notification must include the following information:

- i. The potential source of the release;
- ii. General information including the date, time, location, and cause of the release;
- iii. An estimate of the flow rate and volume of waste involved;
- iv. A procedure for collecting samples and description of laboratory tests to be conducted;
- v. Identification of any water body or water-bearing media affected or threatened;
- vi. A summary of proposed actions; and
- vii. For a physical evidence of a release – the physical factors that indicate evidence of a release; or
- viii. For a measurably significant evidence of a release – the monitoring parameters and/or COCs that are involved in the measurably significant evidence of a release from the [site-specific source area].

b. Other Source That May Cause Evidence of a Release

The Discharger may make a demonstration that a source other than the [site-specific source area] caused evidence of a release. For this case, the Discharger must notify the Lahontan Water Board of the intention to make this demonstration. The notification must be sent to the Lahontan Water Board by certified mail within 7 days of determining physical or measurably significant evidence of a release.

2. Response to a Verified New Release

The Discharger must, within 90 days of verifying a release, submit a Notice of Intent (NOI) and revised Remedial Action Plan (RAP). If the Discharger decides not to conduct verification procedures or decides not to make a demonstration that a source other than the WMUs is responsible for the release, the release will be considered verified. The RAP must include the following information:

- a. COC Concentrations – the maximum concentration of each COC at each monitoring point as determined during the most recent COC sampling event. Any COC that exceeds its concentration limit is to be retested at that monitoring point. Should the results of the retest verify that the COC is above the concentration limit, then that COC will become a monitoring parameter at that monitoring point;
- b. Proposed Monitoring System Changes – any proposed changes to the groundwater and [include other applicable monitoring systems] monitoring systems necessary to meet the provisions of the WDRs;
- c. Proposed Monitoring Changes – any proposed additions or changes to the monitoring frequency, sampling and analytical procedures or methods, or statistical methods used at the Facility necessary to meet the provisions of the WDR; and
- d. Proposed Delineation Approach – a detailed description of the measures to be taken by the Discharger to assess the nature and extent of the release from the [potential source of the release].

5. Monitoring Well Logs

All monitoring wells (including groundwater and [other wells]) and all other borings installed to satisfy the requirements of this MRP must be drilled by a licensed drilling contractor and must be logged during drilling under the direct supervision of either a California-licensed professional geologist or civil engineer with

expertise in stratigraphic well logging. Such logs must be submitted to the Lahontan Water Board electronically within 90 days following completion of fieldwork.

6. Significant Earthquake Event

After a significant<sup>4</sup> or greater earthquake event at or near the Site, the Discharger shall notify the Lahontan Water Board within 48 hours, and within 45 days submit to the Lahontan Water Board a detailed written post-earthquake report describing any physical damages to the remediation system, containment features or groundwater and/or unsaturated zone monitoring systems or to report no damage to the Site was sustained. The Discharger must closely examine the utility piping, inspect the slope conditions, drainage control system, and surface grading for signs of cracking or depressed/settled areas following the earthquake event. If cracking or depressed areas are identified, the Discharger must make repairs to those areas within 30 days from the date of the earthquake event. Repairs and maintenance must be consistent with General Order R6-2022-TENTATIVE.

C. Technical Reports

Pursuant to CWC, section 13267, subdivision (b):

1. Monitoring Systems Installation Report

**No later than 90 days** following completion of construction a monitoring system or monitoring system component, the Dischargers must submit a technical report discussing the installation of the monitoring system or component. The report must summarize all work activities associated with the installation

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<sup>4</sup> A significant earthquake is a seismic event classified according to the United States Geological Survey (USGS) Earthquake Hazard Program as a moderate earthquake measuring between 5 and 5.9 on the Richter scale, or higher. The Discharger may use the Modified Mercalli Intensity Scale VI or higher for equivalent ground shaking generated by a significant earthquake of Richter magnitude 5.0 or higher as contained with the USGS Earthquake Hazard Program Magnitude/Intensity Comparison chart found at <https://earthquakes.usgs.gov>.



of the monitoring system or component. The report must be certified by a California professional civil engineer or a California professional geologist. It must contain sufficient information to verify that the construction was in accordance with State and/or County standards.

2. Sampling and Analysis Plan

**At least 60 days prior** to the operation of a new remediation system, the Discharger must submit a revised SAP to be accepted by the Lahontan Water Board, including procedures for monitoring, sampling, and analysis for the [\[monitoring locations\]](#).

D. General Provisions

The Discharger must comply with Attachment C, "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of this MRP.

E. Failure to Furnish Reports

Any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation pursuant to CWC, section 13268.

F. Violations

If monitoring data indicate a violation of a specific requirement in these WDRs, the Discharger must report the violation in the scheduled report for the corresponding reporting period and provide information indicating the cause of violation(s) and the action taken or planned to bring the discharge into compliance.

G. Electronic Reporting Requirements

Pursuant to CCR, title 23, section 3890, the Discharger must submit reports, including soil, soil-gas, and water data, prepared for the purpose of subsurface investigation or remediation of a discharge of waste to land electronically over the internet to the State Water Resources Control Board's GeoTracker system. This requirement is in addition to, and not

superseded by, any other applicable reporting requirement. The Discharger must provide the monitoring report to the Lahontan Water Board, as specified in this MRP, and upload the full monitoring report into GeoTracker, as stipulated by CCR, title 23.

For all other types of documents and correspondence, please send to the Lahontan Water Board's email address at [Lahontan@waterboards.ca.gov](mailto:Lahontan@waterboards.ca.gov) and include the WDID No. and Facility name in the subject line.

Ordered by: \_\_\_\_\_ Dated: \_\_\_\_\_

MICHAEL R. PLAZIAK, PG  
EXECUTIVE OFFICER

- Attachments:
- A. Water Quality Monitoring Program
  - B. Monitoring Network, [Name of Facility]
  - C. General Provisions for Monitoring and Reporting, September 1, 1994

ATTACHMENT A – MONITORING PROGRAM

<b>GROUNDWATER MONITORING</b>			
<b>Parameter</b>	<b>Units</b>	<b>Sampling Frequency</b>	<b>Reporting Frequency</b>
<b>Field Parameters</b>			
Groundwater Elevation	Feet, Mean Sea Level		
Dissolved Oxygen	milligrams/Liter		
Electrical Conductivity	µmhos/cm		
pH	pH units		
Temperature	Degrees Fahrenheit or Celsius		
Turbidity	NTU		
<b>Monitoring Parameters</b>			
Iron	milligrams/Liter		
Manganese	milligrams/Liter		
Nitrate	milligrams/Liter		
Bicarbonate	milligrams/Liter		
Chloride	milligrams/Liter		
Methane	milligrams/Liter		
Total Dissolved Solids	milligrams/Liter		
Sulfate	milligrams/Liter		
Hydrogen Sulfide	milligrams/Liter		
Carbon Dioxide	milligrams/Liter		
Oxygen	milligrams/Liter		
Other Breakdown Products	milligrams/Liter		
Microbiological communities	milligrams/Liter		
Hydrogen	milligrams/Liter		
Low-Molecular Weight Fatty Acids	milligrams/Liter		
<b>Constituents of Concern</b>			
Amendment Type	milligrams/Liter		
Byproduct	milligrams/Liter		
Pollutant	milligrams/Liter		
Heavy Metals	milligrams/Liter		

<b>INFLUENT MONITORING</b>			
<b>Parameter</b>	<b>Units</b>	<b>Sampling Frequency</b>	<b>Reporting Frequency</b>
<b>Field Parameters</b>			
Dissolved Oxygen	milligrams/Liter		
Electrical Conductivity	µmhos/cm		
pH	pH units		
Temperature	Degrees Fahrenheit or Celsius		
Turbidity	NTU		
<b>Monitoring Parameters</b>			
Iron	milligrams/Liter		
Manganese	milligrams/Liter		
Nitrate	milligrams/Liter		
Bicarbonate	milligrams/Liter		
Chloride	milligrams/Liter		
Methane	milligrams/Liter		
Total Dissolved Solids	milligrams/Liter		
Sulfate	milligrams/Liter		
<b>Constituents of Concern</b>			
Amendment Type	milligrams/Liter		
Byproduct	milligrams/Liter		
Pollutant	milligrams/Liter		
Heavy Metals	milligrams/Liter		

<b>EFFLUENT MONITORING</b>			
<b>Parameter</b>	<b>Units</b>	<b>Sampling Frequency</b>	<b>Reporting Frequency</b>
<b>Field Parameters</b>			
Dissolved Oxygen	milligrams/Liter		
Electrical Conductivity	µmhos/cm		
pH	pH units		
Temperature	Degrees Fahrenheit or Celsius		
Turbidity	NTU		
<b>Monitoring Parameters</b>			
Iron	milligrams/Liter		
Manganese	milligrams/Liter		
Nitrate	milligrams/Liter		
Bicarbonate	milligrams/Liter		
Chloride	milligrams/Liter		
Methane	milligrams/Liter		
Total Dissolved Solids	milligrams/Liter		
Sulfate	milligrams/Liter		
<b>Constituents of Concern</b>			
Amendment Type	milligrams/Liter		
Byproduct	milligrams/Liter		
Pollutant	milligrams/Liter		
Heavy Metals	milligrams/Liter		

<b>STORMWATER MONITORING</b>			
<b>Parameter</b>	<b>Units</b>	<b>Sampling Frequency</b>	<b>Reporting Frequency</b>
<b>Field Parameters</b>			
Biological Oxygen Demand	milligrams/Liter		
Electrical Conductivity	µmhos/cm		
pH	pH units		
Temperature	Degrees Fahrenheit or Celsius		
Total Organic Carbon	Milligrams/Liter C		
Turbidity	NTU		
<b>Monitoring Parameters</b>			
Bicarbonate	milligrams/Liter		
Biological Oxygen Demand	milligrams/Liter		
Carbonate	milligrams/Liter		
Total Suspended Solids	milligrams/Liter		
<b>Constituents of Concern</b>			
Amendment Type	milligrams/Liter		
Byproduct	milligrams/Liter		
Pollutants	milligrams/Liter		
Heavy Metals	milligrams/Liter		

<b>STORMWATER MONITORING</b>			
<b>Parameter</b>	<b>Units</b>	<b>Sampling Frequency</b>	<b>Reporting Frequency</b>
<b>Field Parameters</b>			
Dissolved Oxygen	milligrams/Liter		
Electrical Conductivity	µmhos/cm		
pH	pH units		
Temperature	Degrees Fahrenheit or Celsius		
Turbidity	NTU		
<b>Monitoring Parameters</b>			
Iron	milligrams/Liter		
Manganese	milligrams/Liter		
Nitrate	milligrams/Liter		
Bicarbonate	milligrams/Liter		
Chloride	milligrams/Liter		
Methane	milligrams/Liter		
Total Dissolved Solids	milligrams/Liter		
Sulfate	milligrams/Liter		
<b>Constituents of Concern</b>			
Amendment Type	milligrams/Liter		
Byproduct	milligrams/Liter		
Pollutant	milligrams/Liter		
Heavy Metals	milligrams/Liter		

ATTACHMENT B

Reserved for location map of the monitoring network

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ATTACHMENT C

Reserved for General Provisions of Monitoring and Reporting

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**ATTACHMENT D**

**REQUEST FOR TERMINATION OF WASTE DISCHARGE REQUIREMENTS**

**GENERAL ORDER R6-2022-TENTATIVE**

**FOR**

**IN-SITU AND EX-SITU GROUNDWATER REMEDIATION PROJECTS**

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<b>Waste Discharge Identification #:</b>	<b>Date of Project Completion:</b>

**Landowner Contact Information:**

Name
Mailing Address
Phone Number
Contact Person

**Facility Owner Contact Information:**

Name
Mailing Address
Phone Number
Contact Person

Project Category:

- Full Scale and Pilot Test In-situ Remediation: Groundwater cleanup projects that inject chemical and biological products to the vadose zone or groundwater basin to achieve regulatory compliance with water quality objectives.
- Full Scale Ex-Situ Remediation: Projects involving extraction and treatment of groundwater and discharge of waste to land or reinjection.

- Pilot and Small Scale Ex-situ Remediation: These projects have a discharge of less than 10,000 gallons per day, and do not discharge treated groundwater to groundwaters within one mile of water supply wells (e.g. domestic or public water supply wells, or agricultural water supply wells, etc.). Coverage under the General Order for projects expected to have no or low threat to water quality, human health, and the environment is at the discretion of the Executive Officer.

**Certification:**

I, the landowner and/or facility operator, hereby certify under penalty of perjury that the requirements outlined under General Order R6-2022-TENTATIVE for the above referenced project were conducted in conformance with the approved plan and have achieved water quality objectives.

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Required elements to be submitted with the Request for Termination, at minimum:**

- a. Conceptual Site Model including a summary of the remedial actions that have taken place at the site, a demonstration that cleanup goals have been achieved and an evaluation of the Preliminary Closure Post-Closure Maintenance Plan and financial assurances are adequate to achieve site restoration.
- b. Timeline for site restoration including destruction of all groundwater monitoring, extraction, and injection wells, removal of all remediation equipment, and site restoration to pre-project conditions (such as revegetation and recontouring).

**Steps in Process of Receiving Lahontan Water Board Termination:**

- a. Discharger submits Request for Termination with all required documents.
- b. Lahontan Water Board staff reviews Request for Termination and either concurs that termination is appropriate or requests additional information to support request.
- c. Discharger completes well destruction and site restoration, then submits a well destruction report and site restoration final report.

- d. Lahontan Water Board technical staff reviews final reports and conducts a site inspection.
- e. Lahontan Water Board Executive Officer issues a formal termination notice, if appropriate.

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