CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

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waterboards.ca.gov/coloradoriver/

[TENTATIVE] WASTE DISCHARGE REQUIREMENTS ORDER R7-2023-0011 AND MONITORING AND REPORTING PROGRAM

ORDER INFORMATION

Dischargers:	CalEnergy Operating Corp. and Magma Power Co.
Facility:	J.J. Elmore Geothermal Power Plant, Class II Surface Impoundment (Brine Pond)
Address:	786 West Sinclair Road, Calipatria, CA 92233
County:	Imperial County
WDID:	7A132040018
GeoTracker ID:	L10009916626
Prior Order(s):	R7-2015-0015, R7-2008-0049, R7-2003-0076, 94-016, 91-052, 87-063

Revised January 5, 2023

CERTIFICATION

I, PAULA RASMUSSEN, Executive Officer, hereby certify that the following is a full, true, and correct copy of the order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on January 10, 2023.

Original Signed by

PAULA RASMUSSEN
Executive Officer

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE INDEX

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

WASTE DISCHARGE ORDER R7-2023-0011

WASTE DISCHARGE REQUIREMENTS
FOR
CALENERGY OPERATING CORPORATION
AND
MAGMA POWER COMPANY
J.J. ELMORE GEOTHERMAL POWER PLANT
CLASS II SURFACE IMPOUNDMENT
IMPERIAL COUNTY

FINDINGS

The California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) hereby finds as follows:

1. CalEnergy Operating Corporation (CalEnergy) operates the J.J. Elmore Geothermal Power Plant Class II Surface Impoundment (collectively, Facility), a 49.9-megawatt power generating facility. The Facility includes one Class II Surface Impoundment ("Brine Pond") used for the temporary storage of geothermal brine and associated solids. The Facility also includes the associated geothermal well field, conveyance pipelines, and other infrastructure needed to properly operate the Facility. The Facility is located at 786 West Sinclair Road, Calipatria, California 92233.

2. The Facility is comprised of one individual power plant, the J.J. Elmore Geothermal Power Plant. The Facility layout is shown on **Attachment B**, General Facility Map, incorporated herein.

3. In accordance with California Code of Regulations, title 27, section 20005 et seq. (Title 27), this Order regulates the continued operation, maintenance, monitoring, and eventual closure of the Brine Pond as a Class II Surface Impoundment (alternatively referred to as Waste Management Unit [WMU] or Units). This Order is strictly limited in scope to Waste Discharge Requirements (WDRs) for the existing Brine Pond, and does not address, regulate or authorize any other discharges of waste, including to the various production or injection wells associated with the Facility.

4. As operator of the Facility and its Brine Pond, CalEnergy is the party designated as having primary responsibility for compliance with the provisions of this Order.

5. The Brine Pond is situated on property owned by the Magma Power Company (Magma). Magma, as property owner, is secondarily responsible for compliance with this Order and shall be responsible for compliance with this Order in the event of CalEnergy's noncompliance, and after written notice to Magma.

6. For the purposes of this Order, CalEnergy and Magma are collectively referred to in singular form as “Discharger."

7. The Facility is located in the Salton Sea Known Geothermal Resource Area (KGRA), approximately seven miles west of the town of Calipatria in Imperial County. The Facility is located at latitude 33.17807 and longitude -115.602734, as shown on **Attachment A**, Location Map, incorporated herein.

8. On August 11, 2022, the Discharger submitted a Report of Waste Discharge (ROWD) to the Regional Water Board in response to the Regional Water Board’s request so that updated WDRs could be adopted for the Facility. The Facility is assigned Waste Discharge ID (WDID) No. 7A132040018 and GeoTracker Global ID No. L10009916626.

Board Order History

9. The first Board Order, 87-063, for the Facility was adopted in July 1987. This Board Order was updated by Order 91-052 in November 1991 to include an expansion of the Facility’s exploratory geothermal wells and an increase in volume in the Brine Pond. Order 91-052 was updated by Order 94-016 to comply with section 13263 of the California Water Code and to incorporate the applicable provisions of Chapter 15, Division 3, Title 23, California Code of Regulations. Order R7-2003-0076 updated Order 94-016 to comply with applicable provisions of Title 27 of the California Code of Regulations. Board Order R7-2003-0076 was updated by Order R7-2008-0049 to include newly installed background compliance wells for the existing brine pond. Order R7-2008-0049 was updated by R7-2015-0015 to comply with current laws and regulations, as set forth in the California Water Code and the California Code of Regulations, and to document any changes to the Facility or operating procedures that could impact groundwater.[1]

10. This Order updates the WDRs in Order R7-2015-0015 to comply with current laws and regulations, as set forth in the Water Code and California Code of Regulations, and to document changes to the Facility or operating procedures that could impact groundwater, including: updated mechanical separator Best Management Practices (BMPs) to more efficiently manage the buildup of geothermal solids in the Brine Pond, the classification of chemicals that are used that may interact with the Brine Pond, and the definitions of a Reporting Threshold for each Leachate Collection and Removal System (LCRS) Sump.

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[1] R7-2015-0015, Findings 6-7.

Facility Operations and Wastewater Disposal

11. The Facility's power plants use steam from hot (450° to 500° F) geothermal brines to turn turbines to produce electricity. The brines are obtained from production wells that extend 2,500 to 9,500 feet below the ground surface. After the energy is extracted, the brines are returned to the subsurface via injection wells. The well field includes numerous production and injection wells and insulated conveyance pipelines.

12. Electricity is generated by injecting the hot brine into one or more separators where the water flashes into steam, which then is used to propel a turbine generator. The steam is then cooled and condensed and either used in the plant's cooling system or injected back into the geothermal reservoir.

13. After steam is extracted for power generation, most of the spent brine is routed directly to injection wells where it is reintroduced into the ground. The number and location of geothermal production and injection wells in use at any given time varies. **WDRs Table 1** reflects the number and ownership of properties associated with the Facility's geothermal production and injection wells in operation at the time of permit adoption and is included for informational purposes only:

WDRs Table 1 – Well Name, Use, Location and Ownership

Well ID	Well Type	APN	Owner
Elmore IW-03	Rescinded	020-100-043	John J Elmore, Trustee. 696 N. 8th St., Brawley, CA 92277
Elmore IW-04	Injection, Brine	020-120-061	John J Elmore, Trustee. 696 N. 8th St., Brawley, CA 92277
Elmore IW-05	Injection, Brine	020-120-062	John J Elmore, Trustee. 696 N. 8th St., Brawley, CA 92277
Elmore IW-06	Injection, Condensate	020-100-038	John J Elmore, Trustee. 696 N. 8th St., Brawley, CA 92277
Elmore 12	Production	020-100-038	Imperial Magma LLC., 551 W. Main St., Suite 1, Brawley CA 92277

Well ID	Well Type	APN	Owner
Elmore 14	Production	020-100-036	Robert Bruce Smith, et al., 681 Marilyn Ave., Brawley, CA 92277
Elmore 15	Production	020-100-036	Robert Bruce Smith, et al., 681 Marilyn Ave., Brawley, CA 92277
Elmore 16	Production	020-100-036	Robert Bruce Smith, et al., 681 Marilyn Ave., Brawley, CA 92277
Smith-IW-01	Injection, Plant/Pond	020-120-040	Anne Kelley Ranches, LTD. 696 N. 8th St. Brawley, CA 92277
Smith-IW-02	Injection, Brine	020-120-040	Anne Kelley Ranches, LTD. 696 N. 8th St. Brawley, CA 92277

14. The Department of Conservation, Geologic Energy Management Division[2] (CalGEM) regulates the drilling, operation, and closure of geothermal wells, as well as the reinjection of geothermal brine from the well head into the geothermal aquifer, including but not limited to: approval of wells for reinjection; flow rate and volume of geothermal fluids reinjected; well location; casing design; casing leak detection; additives; and leak detection and inspection.

15. A small portion of brine is routed to the Brine Pond rather than being directly reinjected, primarily brine associated with system startup, shutdown, or malfunction events. The Brine Pond also hold fluids generated during other onsite activities that are described more fully in the section entitled Waste Unit Classification. Fluid from the Brine Pond is also routinely recycled back into the power plant's piping system, where it reenters the process flow of the Facility.

16. A primary function of the Brine Pond is removal of precipitating solids from the brines. The solids are then manually removed from the Brine Pond with an excavator. In addition to the solids settling out by gravity and subsequent manual removal from the pond, the Discharger may use several mechanical separator systems to remove solids from the brine, as follows:

[2] Formerly Division of Oil, Gas and Geothermal Resources (DOGGR).

a. A filter composed of inert material such as sand or diatomaceous earth inside a “sock” of polypropylene yarns or other permeable material;

b. A metal filter press (two flat plates) that squeezes water from solids; and,

c. Woven geotextile filter bags, usually made of 100 percent polypropylene yarns, that retain solids while allowing liquid to seep out.

The mechanical separator systems either pump the filtrate back into the geothermal process circuit or the systems are placed on an impermeable surface next to the Brine Pond (such as inside a ‘roll-off bin’) and the liquid is allowed to return to the Brine Pond. In either case, the separated solids are retained in the separator system for eventual disposal offsite. Flow diagrams depicting the mechanical separator systems are included as **Attachments C, D and E**.

17. The Facility also has a freshwater makeup pond to supply water to the cooling towers. This Order does not regulate the operation of the freshwater pond.

18. Chemicals are added to the cooling water system and brine handling process to prevent scaling, biological growth, and corrosion and to adjust the water’s pH and inhibit undesirable chemical reactions. Chemical classes approved of at the time of permit adoption include Class 5 oxidizing organic peroxides and biocide in the cooling tower; Class 8 corrosives as industrial strength oxidants and biocides; hydrochloric acid for pH control at some locations in the process, and sodium hydroxide for control at other locations in the process, among other chemicals. **WDRs Table 2** includes a list of the chemical products currently used at the Facility. The use of new chemicals requires written Executive Officer approval but does not necessitate a Board Order update.

WDRs Table 2—Approved Chemical Products

Chemical Treat. Product Names	Purpose	Nalco (or other) Equivalent
CL5428	Dispersants	3DT121, 3DT133, 3DT191, 3DT102
CL456, CL452, CL453	Biodetergent/Surfactant	73551, 73550
CT775, CT709, CT788, CL5788, CT790, CL1495	Corrosion Inhibitor - phosphate based	3DT487, 3DT184, 3DT195

Chemical Treat. Product Names	Purpose	Nalco (or other) Equivalent
CL216, CL2250, CL2150, CL2115, CL2065	Non-Oxidizing Biocides	7614, 7330, 7320, 7338, ST-70
12.5% Sodium Hypochlorite (Bleach)	Bleach Oxidizing Biocide	-
CL41, CL4520	chlorine / bromine oxidizing biocides used in conjuction with an oxidant such as bleach (NaOCl)	1318
CL241	Anti-Foam	7471
C2187T	TowerBrom tablets	TowerBrom 991
C2184G	TowerBrom granular	TowerBrom 960
GS5810	Tower Cleaning	-
CL4822, P8000L	Prevent Iron Deposition	-
-	Flocculant	N9907
-	Anti Foam	N7471
-	NORMS Inhibitor	GE0901
-	Oxygen Scavenger	1720
-	Scale Inhibitor	GE0912, GE0906

19. A surface water conveyance system is located underfoot throughout the power plant to collect wastewater generated from cleanups and washdowns. The conveyance system is concrete lined and covered by an open grate. Wash-down water is discharged through the conveyance system to the Class II Surface Impoundment.

Waste and Unit Classification

20. The Discharger is permitted to place geothermal liquids, geothermal solids, and geothermal drilling waste in the Brine Pond, which is a Class II surface impoundment and waste management unit under Title 27.

21. The Brine Pond is the only WMU at the Facility. The Pond was reconstructed in 1991 by building a new pond within the existing footprint of the original pond. The construction of the pond is summarized in **WDRs Table 3**, below.

WDRs Table 3—Waste Management Units at Facility

Unit	Capacity (Gallons)	Liner System	Status
Brine Pond	1,658,000	Protective Layer – one foot of cement-stabilized sand compacted to 90 percent (Proctor method); Primary Layer – Synthetic 35-mil XR-5 flexible membrane; LCRS – One foot of compacted Class II millimeter run granular material compacted to 90 percent; Lower Layer – Two feet of clay compacted to 80 percent (Proctor method).	Active

22. The Pond is constructed within raised earthen berms that rise approximately eight feet above the surrounding land surface and is roughly square in shape, measuring approximately 200 feet by 200 feet. The granular compacted layer beneath the synthetic liner is the drainage and collection portion of the LCRS. The drainage and collection portion of the LCRS has five leachate collection zones, each of which consists of a shallow, gravel-filled trench oriented along the perimeter of the Pond. Each collection zone contains a perforated, four-inch diameter pipe that drains horizontally to a sump located outside the footprint of the pond through a three-inch diameter polyvinyl chloride (PVC) pipe. Each of the five LCRS sumps are approximately two and a half-foot diameter concrete pipes, oriented vertically, and covered with a steel lid. The drainage pipes enter the sumps above the bottom of the sumps to prevent unnecessary liquids from accumulating in the drainage and collection portion of the LCRS; The volume of each sump before this occurs is approximately 440 gallons. The sumps are numbered TW-1, TW-2, TW-3, TW-4, and TW-5 and are visible on **Attachment F.**

23. All of the following wastewater streams are directed to the Brine Pond and/or to the injection wells for direct injection into the geothermal reservoir:

    a. Cooling tower blowdown (liquids);

    b. Geothermal drilling wastes (solids and liquids);

    c. Geothermal waste (solids):

    d. Geothermal brine (liquids),

    e. Geothermal brine precipitates (solids);

    f. Portable shower effluent (liquids);

    g. Spills and water from hydroblasting (solids and liquids);

    h. Wastewater generated from plant cleanups and washdowns, including water collected by the plant conveyance system (liquids);

    i. Vehicle wash station effluent (liquids);

    j. Process filtrate from the Brine Pond filter press, geotextile solids-dewatering bags (used to dewater geothermal solids before final disposal), or other mechanical separator Best Management Practices (BMPs) that the Discharger is granted approval to use by the Executive Officer (liquids);

    k. Lime sump effluent (liquids); and

    l. Effluent from emission abatement equipment (liquids).

24. The geothermal brine at the Facility is highly saline (over 10,000 mg/L total dissolved solids [TDS]) and may also contain high concentrations of metals. Therefore, the discharge is considered “designated waste”,[3] which is defined in Water Code section 13173 as nonhazardous waste containing pollutants that, under ambient environmental conditions at a WMU, could be released in concentrations with the potential to exceed water quality objectives for areal surface waters and groundwater or otherwise adversely affect beneficial uses of the waters of the state. (See also Title 27, § 20210.) (TDS) and heavy metals. As

[3] Geothermal fluids managed in surface impoundments such as the Brine Ponds are expressly exempted from management as “hazardous waste” pursuant to Health and Safety Code section 25143.1.

such, the wastes named in Finding 23 must be discharged to the Brine Pond, which is regulated under Title 27.

25. Periodically, the Discharger may need to remove solids from the Brine Pond that precipitate out of the liquid brine as it cools or settles, as described in finding 16. The Discharger is responsible for conducting confirmation sampling of the removed solids and disposing of the solid waste at a proper final disposal facility. With proper maintenance, the Brine Pond will continue to function as designed and the required freeboard level of two feet can be maintained.

26. According to the Discharger, any hazardous waste generated or stored at the Facility, that is not a “designated waste,” is stored and disposed of in a manner compliant with federal and state regulations, and not placed into the Brine Pond.

27. Title 27, section 20240, subdivision (c) establishes a prescriptive standard that existing surface impoundments be “operated to ensure that wastes will be a minimum of five feet (5 ft.) above the highest anticipated elevation of underlying ground water.” The purpose of this prescriptive standard is to ensure that groundwater does not come into contact with the waste inside the WMU, thereby becoming leachate. (State Water Board, Statement of Reasons for 1984 Rule, Section II.B.6.a [Cal. Code Regs., tit. 23, § 2530], p. 3.8).

28. There is approximately five feet of separation between the bottom of the Brine Pond and the highest anticipated groundwater elevation.

Hydrogeologic and Climate Conditions

29. The Discharger reports that shallow groundwater in the area of the Facility occurs approximately 5 to 15 feet below ground surface, flows generally to the northwest towards the Salton Sea, has a total dissolved solids concentration ranging from approximately 1,240 to 55,000 mg/L and often contains naturally occurring heavy metals (such as arsenic) at concentrations exceeding Primary and Secondary Maximum Contaminant Levels established under title 22 of the California Code of Regulations.

30. The amount of usable near-surface groundwater in the central Imperial Valley is unknown, but this resource has not been significantly exploited because of low well yields and poor chemical quality. The upper 500 feet of fine-grained deposits in the central portion of the Imperial Valley are estimated to have a transmissivity of less than 10,000 gallons per day. Even lower permeabilities are estimated to occur at greater depths (Westec, 1981), and low vertical permeability inhibits mixing of waters from different depths, such as between the shallow aquifer system and underlying deeper groundwater that includes the geothermal resources.

31. The Facility is largely surrounded by farmland that is drained by an extensive network of ditches and drains in agricultural areas. These drains discharge into the Alamo and New Rivers, which are tributary to the Salton Sea. Canal seepage and tiled agricultural drains recharge the shallow aquifer, the Salton Sea, and potentially even recharge the deeper aquifer in the form of seepage from canals and irrigated agricultural lands. Groundwater in the basin is constantly being mixed with imported Colorado River water that is used for irrigating large parts of the Imperial Valley. Colorado River water is generally of a calcium-sodium chloride-sulfate type. The Colorado River is located more than 50 miles east of the Facility.

32. Climatological data obtained from 1903 to 2015 indicates an average seasonal precipitation of 3.15 inches, and an average annual pan evaporation rate greater than 100 inches.

33. The wind direction in the immediate vicinity of the Facility follows two general patterns:

34. Seasonally from late fall through early spring, prevailing winds are from the west and northwest. Humidity is lowest under these conditions.

35. Summer weather patterns are often dominated by an intense, heat-induced low-pressure area that forms over the interior deserts, drawing air from the south; humidity is highest under these “monsoon” conditions.

36. Five groundwater monitoring wells are monitored semi-annually to monitor for a release to groundwater from the Brine Pond. Wells EMV1, EMV-2, EMV-4 and EMV-5 surround the Pond. Well EMV-5 is approximately 100 feet east of the Pond on the opposite side of the Facility’s Fresh Water Pond. The location of the monitoring wells is shown on **Attachment F**.

37. Domestic wells are not located within 500 feet of the Facility.

Regional Geology

38. The Facility is located in Imperial Valley within the Salton Trough, a landward extension of the East Pacific Rise. The Salton Trough is a closed basin located below sea level and separated from the Gulf of California by the Colorado River delta. The Trough is a structural (bedrock) and topographic (ground surface) depression in the Earth’s crust that contains thousands of feet of heterogeneous Tertiary and Quaternary aged lacustrine and deltaic sediments associated with the Colorado River delta. The area is tectonically active and has numerous faults associated with the San Andreas Fault Zone. The lowest area of the basin is the Salton Sea at about 230 feet below mean sea level.

39. The Salton Trough was filled as it subsided by sediments from the Colorado River, which constructed a large transverse alluvial delta extending westward from the vicinity of Yuma, Arizona, to the western side of the Imperial Valley, effectively forming a dam across the southern end of the Salton Trough that prevented marine water from the Gulf of California from entering the basin. Thereafter, periodic diversions of the Colorado River northward into the Salton Trough (rather than flowing directly to the Gulf of California) supplied enormous volumes of water and sediments to the developing and subsiding land-locked basin. As a result, the sedimentary layers in the Salton Trough are up to 21,000 feet thick and comprised of sandstone, siltstone, and mudstones. Though individual sedimentary layers are discontinuous over long distances, internally consistent packages of sedimentary layers can be traced for miles across the geothermal well field.

40. The sedimentary sequence in the area is interpreted to encompass the Brawley and Borrego Formations, and possibly the Palm Springs Formation at great depth. The Brawley Formation, which is Pleistocene to Holocene in age, is dominated by a 1,000 to 1,300-foot-thick evaporate-bearing clay and siltstone unit that acts as the cap rock to the geothermal reservoir. Beneath this is the Pleistocene aged Borrego Formation down to a depth of at least 5,000 to 6,000 feet.

41. The geologic materials from 1,000 to about 3,500 feet are mostly mudstones with minor associated argillaceous siltstones and lesser amounts of very fine-grained subarkosic sandstones. These sandstones, which are obviously not hydrothermally altered, are partially cemented with diagenetic calcite. The estimated intrinsic inter-granular porosity tends to decrease with depth from about 30% to less than 10%. From about 3,500 feet to about 5,000 to 6,000 feet the material is more or less subequal amounts of mudstones, siltstones and fine-grained sandstones. There is a formational change below 5,000 to 6,000 feet to dominantly fine to medium grained subarkosic sandstones with subordinate amounts of siltstone and shale. This is tentatively interpreted to be the Pleistocene to Pliocene aged Palm Springs Formation. Mafic and silicic volcanic rocks are occasionally found from 5,000 feet to below 8,000 feet.

42. The Salton Sea geothermal reservoir occurs in fractured sedimentary rocks within the Salton Trough, a structural depression on the boundary between two tectonic plates. The northwest motion of the Pacific Plate on the west, relative to the North American Plate on the east, has created regional right-lateral faults-oriented Northwest-Southeast and local conjugate left-lateral faults, oriented Northeast-Southwest. The thermal anomaly of the Salton Sea field is aligned Northeast-Southwest and appears to be centered on major left-lateral faults some of which acts as a conduit for geothermal brines upwelling from depth. Within the Salton Sea field, past volcanic activity is indicated by four outcrops of

rhyolite lava (Obsidian Butte, Rock Hill, Red Island and Mullet Island), as well as rhyolite sections of volcanic rocks encountered in several wells. Due to circulating groundwater through salt-bearing beds within the Salton Trough, the geothermal brines at the Salton Sea are highly saline, with TDS in the range of 21 to 28 percent by weight. Reservoir temperatures at the Salton Sea are among the hottest of any geothermal field in the world, with encountered temperatures in excess of 700 degrees Fahrenheit.

Basin Plan and Other Regulatory Considerations

43. The Water Quality Control Plan for the Colorado River Basin Region (Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. Pursuant to Water Code section 13263, subdivision (a), WDRs implement the Basin Plan and take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, the need to prevent nuisance, and the provisions of Water Code section 13241.

44. The Facility is located in the Imperial Hydrologic Unit. The Basin Plan states that the beneficial uses of groundwater in the Imperial Hydrologic Unit are:

    a. Municipal and Domestic Supply (MUN), and

    b. Industrial Supply (IND).

45. Surface waters in the area of the Facility include the Imperial Irrigation District (IID) irrigation delivery canals and surface drains, the Alamo River, and the Salton Sea. The beneficial uses of surface waters in the area of the Facility are as follows:

    a. Imperial Valley Drains

        i. Freshwater Replenishment (FRSH),

        ii. Water Contact Recreation (REC I),

        iii. Non-contact Water Recreation (REC II),

        iv. Warm Freshwater Habitat (WARM),

        v. Wildlife Habitat (WILD), and

        vi. Preservation of Rare, Threatened, or Endangered Species (RARE).

b. Alamo River

i. Freshwater Replenishment (FRSH),

ii. Water Contact Recreation (REC I),

iii. Non-Contact Water Recreation (REC II),

iv. Warm Freshwater Habitat (WARM),

v. Wildlife Habitat (WILD),

vi. Hydropower Generation (POW), and

vii. Preservation of Rare, Threatened, or Endangered Species (RARE).

c. Salton Sea

i. Aquaculture (AQUA),

ii. Industrial Service Supply (IND),

iii. Water Contact Recreation (RECI),

iv. Noncontact Water Recreation (RECII),

v. Warm Water Habitat (WARM),

vi. Wildlife Habitat (WILD), and

vii. Preservation of Rare, Threatened, or Endangered Species (RARE).

46. This Order establishes WDRs pursuant to division 7, chapter 4, article 4 of the Water Code for discharges that are not subject to regulation under Clean Water Act section 402 (33 U.S.C. § 1342).

47. These WDRs implement numeric and narrative water quality objectives for groundwater and surface waters established by the Basin Plan and other applicable state and federal laws and policies. The numeric objectives for groundwater designated for municipal and domestic supply (MUN) include the Maximum Contaminant Levels (MCLs) and bacteriological limits specified in California Code of Regulations, title 22, section 64421 et seq. The Basin Plan states that groundwater for use as domestic or municipal water supply (MUN) must not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses as a result of human activity.

48. It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring the Discharger to maintain waste containment systems that prevent discharges of waste to waters of the state.

49. These WDRs implement state regulations applicable to the discharge of solid/designated waste to land found in California Code of Regulations, title 27 (Title 27), division 2, subdivision 1, commencing with section 20005. These regulations contain classification criteria for wastes and for disposal sites, and prescribe minimum standards for the siting, design, construction, monitoring, and closure of the Brine Pond.

50. Water Code section 13267 authorizes the Regional Water Board to require technical and monitoring reports. Monitoring and Reporting Program (MRP) R7-2023-0011 establishes monitoring and reporting requirements to implement state requirements and demonstrate compliance with this Order and to identify the Facility's impact, if any, on receiving waters. The State Water Resources Control Board's (State Water Board) electronic database, GeoTracker Information Systems, facilitates the submittal and review of facility correspondence, Discharger requests, and monitoring and reporting data. The burden, including costs, of the MRP bears a reasonable relationship to the need for the information and the benefits to be obtained from that information.

51. The discharge of waste is a privilege, not a right, and adoption of this Order does not create a vested right to continue. (Wat. Code, § 13263, subd. (g).)

52. Effective January 1, 2023, Water Code section 13149.2, subdivision (d) requires that the Colorado River Basin Water Board, "[w]hen issuing … individual waste discharge requirements … that regulate activity or a facility that may impact a disadvantaged[4] or tribal community,[5] and that includes a time schedule in accordance with subdivision (c) of Section 13263 for achieving an applicable water quality objective, an alternative compliance path that allows time to come into

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[4] For the purposes of this requirement, a "disadvantaged community" is defined as a "community in which the median household income is less than 80 percent of the statewide annual median household income level." (Wat. Code, § 13149.2, subd. (f)(1).)

[5] For the purposes of this requirement, a "tribal community" is defined as a "community within a federally recognized California Native American tribe or nonfederally recognized Native American tribe on the contact list maintained by the Native American Heritage Commission for the purposes of Chapter 905 of the Statutes of 2004." (Wat. Code, § 13149.2, subd. (f)(2).)

compliance with water quality objectives, or a water quality variance…," must include finding(s) regarding "potential environmental justice, tribal impact, and racial equity considerations" that are relevant to the permitting action. (Assem. Bill No. 2108 (2021-2022 Reg. Sess.) § 3.) This Order does not incorporate a time schedule for compliance with applicable WQOs, or any of the other provisions described in Water Code section 13149.2, subdivision (d). Accordingly, no additional findings are necessary under section 13149.2.

Antidegradation Analysis

53. State Water Board Resolution 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California* (Antidegradation Policy), generally prohibits the Regional Water Board from authorizing discharges that will result in the degradation of high quality waters, unless it is demonstrated that any change in water quality will: (a) be consistent with maximum benefit to the people of the state, (b) not unreasonably affect beneficial uses, and (c) not result in water quality less than that prescribed in state and regional policies (e.g., violation of one or more water quality objectives). The discharger must also employ best practicable treatment or control to minimize the degradation of high-quality waters. High quality waters are surface waters or areas of groundwater that have a baseline water quality better than required by water quality control plans and policies.

54. In accordance with Title 27, this Order requires total containment of all wastes discharged to the Brine Pond (§ 20310, subds. (a)-(b)), and in the event of a release, corrective action (§ 20340). Compliance with these WDRs will preclude any degradation in quality of the waters of the State of California. Accordingly, this Order is consistent with the Antidegradation Policy.

Stormwater

55. Federal regulations for stormwater discharges were promulgated by the U.S. Environmental Protection Agency on November 16, 1990 (40 C.F.R. parts 122, 123, and 124) to implement the Clean Water Act's stormwater program set forth in Clean Water Act section 402(p) (33 U.S.C. § 1342(p)). In relevant part, the regulations require specific categories of facilities that discharge stormwater associated with industrial activity to "waters of the United States" to obtain National Pollutant Discharge Elimination System (NPDES) permits and to require control of such pollutant discharges using Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to prevent and reduce pollutants and any more stringent controls necessary to meet water quality standards.

56. The State Water Board adopted Order 2014-0057-DWQ (NPDES No. CAS000001), *General Permit for Storm Water Discharges Associated with*

Industrial Activities (Industrial General Permit), which became effective on July 1, 2015.[6] The Industrial General Permit regulates discharges of stormwater associated with certain industrial activities, excluding construction activities, and requires submittal of a Notice of Intent (NOI) to be covered under the permit. The Discharger indicates that it has not enrolled in the Industrial General Permit because it does not fall within the covered facilities in Attachment A.

57. In 1998, the Water Code was amended to require entities who are requested by the Water Boards to obtain General Permit coverage, but that have a valid reason to not obtain General Permit coverage, to submit a Notice of Non-Applicability (NONA). (Wat. Code, § 13399.30, subd. (a)(2)). The NONA covers multiple reasons why an entity is not required to be permitted including (1) facility closure, (2) not the legal owner, (3) incorrect SIC code, (4) eligibility for the Conditional Exclusion (No Exposure Certification), and (5) the facility not discharging to a water of the U.S. ("No Discharge"). State Water Board General Order 97-03-DWQ (superseded by General Order 2014-0057-DWQ) contained definitions, requirements, and guidance that entities may reference to determine whether they are eligible to select any of the first four NONA reasons for not obtaining General Permit coverage. However, neither General Order 97-03-DWQ nor the Water Code provided definitions, requirements, and guidance for entities to determine whether they are eligible to indicate "No Discharge" on the NONA as a reason for not obtaining General Permit coverage.

    State Water Board General Order 2014-0057-DWQ addresses and resolves the issues discussed above by establishing consistent, statewide eligibility requirements in Section XX.C for entities submitting NONAs indicating "No Discharge." When requested by the Water Boards to obtain General Permit coverage, entities must meet these "No Discharge" eligibility requirements or obtain General Permit coverage.

58. The Discharger states that under normal working conditions, the capacity of the Brine Pond and facility conveyance system is large enough to accept wastewater generated at the Facility as well as precipitation within the footprint of the Brine Pond for a 24-hour storm event with a 1000-year occurrence interval.

59. The Discharger must comply with all pertinent stormwater requirements contained in Title 27 and in this Order.

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[6] As amended by Order No. 2015-0122-DWQ and Order No. 2018-0028-DWQ.

Financial Assurances

60. The State Water Board-promulgated provisions of Title 27 require maintenance of appropriate financial assurance mechanisms to cover all expenses related to the Brine Pond for the following:

    a. Closure Activities (Title 27, § 22207) – in at least the amount of the current cost estimate for closure; and

    b. Corrective Action (Title 27, § 22222) – for initiating and completing corrective action for all known or reasonably foreseeable corrective action.

61. Because the Discharger has an approved Preliminary Closure Plan to "clean close" the Brine Pond (see Cal. Code Regs., tit. 27, § 21400), financial assurances are not required for post-closure maintenance. In the event the Discharger is unable to clean-close the pond, such financial assurances will be required.

62. **Within 90 days** following the issuance of this Order, the Discharger must provide appropriate assurances of financial responsibility for closure and for corrective action in compliance with Title 27.

CEQA and Public Participation

63. These WDRs regulate the operation of an existing facility, involving negligible or no expansion of use beyond that previously existing, and is exempt from the California Environmental Quality Act (CEQA), Public Resources Code, section 21000 et seq. (See Cal. Code Regs., tit. 14, § 15301.)

64. The Regional Water Board has notified the Discharger, and all known interested agencies and persons of its intent to issue waste discharge requirements for this discharge and provided them with an opportunity for a public meeting and to submit comments.

65. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to this discharge.

REQUIREMENTS

IT IS HEREBY ORDERED, pursuant to Water Code sections 13263 and 13267, that Waste Discharge Requirements Order R7-2015-0048 is rescinded (except for enforcement purposes), and the Discharger shall comply with the following:

A. Discharge Prohibitions

1. The discharge of waste classified as “hazardous,” as defined by Title 27, section 20164 is prohibited.

2. The disposal of incompatible wastes or wastes that, when mixed or commingled with other wastes, may create heat, pressure, fire, explosion, toxic by-products, or other chemical reactions that: (1) impair the integrity of the containment structures, or (2) generate products requiring a higher level of containment than provided by the waste management unit into which the wastes are placed, is prohibited.

3. The discharge of wastewater to a location or in a manner different from that described in this Order is prohibited.

4. The discharge of waste to land not owned or controlled by the Discharger, or not authorized for such use, is prohibited.

5. The discharge of waste to the unsaturated/vadose zone or to groundwater is prohibited.

6. The discharge of waste to surface waters or surface drainage courses is prohibited.

7. The discharge of solid geothermal waste (i.e., brine particulates or precipitates) to the Brine Pond as a final form of disposal is prohibited.

8. Domestic waste or sewage shall not be discharged to the Brine Pond.

9. The storage, treatment, or disposal of wastes from the Facility shall not cause contamination, pollution, or nuisance as defined in Water Code section 13050, subdivisions (k), (l), and (m).

B. Discharge Specifications

1. The Discharger shall comply with all applicable provisions of Title 27, including those not specifically referenced herein.

2. Wastes shall be discharged only into WMU specifically designed for their containment and/or treatment, as described herein.

3. The Discharger is responsible for accurate characterization of wastes, including determinations of whether wastes will be compatible with containment features and other wastes at the WMUs, and whether the

wastes are required to be managed as a “hazardous” waste or “designated” waste.

4. The discharge shall not cause the concentration of any Constituent of Concern (including Monitoring Parameters), as defined in the operative Monitoring and Reporting Program, to exceed its representative concentration limit in any monitoring medium (i.e., exceed the Water Quality Protection Standard). The concentration limit for each constituent will be set in accordance with the MRP. Data analysis shall be performed in accordance with the MRP.

5. The Discharger shall promptly notify the Regional Water Board of any slope failure occurring at the Brine Pond. The Discharger shall promptly correct any failure which threatens the integrity of containment features or the unit in accordance with the method approved by the Regional Water Board’s Executive Officer.

6. The Discharger shall promptly remove and properly dispose of any unpermitted wastes that are discharged at the Facility in violation of these requirements.

7. Leachate collected from a WMU shall be discharged to the unit from which it came, or discharged to an appropriate waste management unit in accordance with Title 27, sections 20200(d) and 20340(g), and in a manner consistent with the waste classification of the liquid.

8. Discharges to the Brine Pond shall be limited to the following waste streams:

    a. Geothermal drilling wastes, well cleanout fluids, well-test fluids, and production-well startup fluids;

    b. Geothermal brine and brine precipitates (solids and sludge);

    c. Wastewater generated from plant cleanups and washdowns discharged via the conveyance system;

    d. Cooling tower blowdown;

    e. Portable shower effluent;

    f. Water from hydroblasting;

    g. Vehicle washing station effluent;

h. Filtrate of Brine Pond-solids dewatering that is being returned to the Brine Pond from the filter press or other dewatering process allowed by this permit;

i. Lime sump effluent; and

j. Effluent from air emission abatement equipment.

9. At least **30 days prior** to the use of a new chemical class for control of microbes, pH, scale, and corrosion of cooling tower water and/or geothermal brine, the Discharger shall notify the Regional Water Board's Executive Officer in writing. The use of a new class of chemicals may not be utilized until approved in writing by the Regional Water Board's Executive Officer. The Executive Officer may require the MRP (i.e., MRP R7-2023-0011 and subsequent revisions thereto) may to be revised to incorporate the new class of chemical(s) as a monitored Constituent of Concern.

10. The Brine Pond shall contain a LCRS between the upper and lower liners.

11. The Discharger shall maintain sufficient freeboard in the Brine Pond to accommodate seasonal precipitation and to contain a 1,000 year 24-hour storm event, but in no case no less than two (2) feet of freeboard (measured vertically).

12. Any direct-line discharge to the Brine Pond shall have fail-safe equipment or operating procedures to prevent overfilling. Discharges shall be stopped in the event of any containment system failure which causes a threat to water quality.

13. If during the active life of the Brine Pond, the wastes are removed and the bottom of the impoundment is cleaned down to the liner, an inspection shall be made of the bottom of the liner prior to refilling of the impoundment to confirm that the liner has not been damaged.

14. The LCRS shall be designed, constructed, maintained, and operated to collect, store, and remove twice the maximum anticipated daily volume of leachate from the WMU.

15. The LCRS shall be operated to function without clogging through the scheduled closure of the Brine Pond and during the post-closure maintenance period (if clean-closure does not occur). The LCRS shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions.

16. The liquid entering the LCRS sump shall not accumulate to an extent that it extends out of the LCRS sump and into the collection portion of the LCRS. The Discharger shall remove fluids from the LCRS sump as often as needed to prevent the liquid in the LCRS from backing up into the collection portion of the LCRS.

17. LCRS maintenance and repair plans shall be submitted to the Regional Water Board in advance of any work. The Discharger is only authorized without prior approval to conduct ongoing, minor maintenance repairs to minimize the exposure of the liner and keep any tears from the edges of the liner from worsening. Surface impoundment repair plans and liner Construction Quality Assurance (CQA) Plans shall be developed and stamped by a licensed professional experienced in this type of work.

18. Residual solids obtained from wastewater discharged to the Brine Pond shall be discharged only at a solid waste management facility (landfill) licensed to receive such wastes. The Discharger shall maintain legible records on the volume and type of waste removed from the Brine Pond and shall submit a shipping manifest or other appropriate documentation showing the disposal method and location.

19. Public contact with material in the Brine Pond shall be precluded through fences, signs, or other appropriate alternatives.

C. Stormwater Specifications

1. The Brine Pond shall be designed, constructed, operated, and maintained to limit, to the greatest extent possible, erosion, slope failure, overtopping, inundation or washout, and damage resulting from natural disasters such as: flood volumes from a 24-hour storm event having a predicted frequency of once in 1,000 years, pursuant to Title 27, section 20375; the Maximum Credible Earthquake (MCE) pursuant to section 20310, Table 4.1; and severe wind storms.

2. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit.

3. Surface drainage from tributary areas, and internal site drainage from surface or subsurface sources, shall not contact or percolate through the wastes discharged at the Facility.

4. Diversion and drainage facilities shall be designed, constructed, and maintained to:

a. Accommodate the anticipated volume of precipitation and peak flows from surface runoff and under the precipitation conditions for the waste management unit.

b. Effectively divert sheet flow runoff laterally, via the shortest distance, into the drainage and collection facilities.

c. Prevent surface erosion through the use of energy dissipators, where required, to decrease the velocity of runoff, slope protection, and other erosion control measures where needed to prevent erosion.

d. Control and intercept run-on, in order to isolate uncontaminated surface waters from water that might have come into contact with waste.

e. Take into account:

i. For closed waste management units and for closed portions of units, the expected final contours of the closed unit, including its planned drainage pattern.

ii. For operating portions of waste management units other than surface impoundments, the unit's drainage pattern at any given time.

iii. The possible effects of the waste management unit's drainage pattern on and by the regional watershed.

iv. The design capacity of drainage systems of downstream and adjacent properties by providing for the gradual release of retained water downstream in a manner which does not exceed the expected peak flow rate at the point of discharge if there were no waste management units or facility.

v. Preserve the system's function. The Discharger shall periodically remove accumulated sediment from the sedimentation or retention basins as needed to preserve the design capacity of the system.

5. Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system.

D. Monitoring Specifications

1. The Discharger shall implement the operative Monitoring and Reporting Program to detect at the earliest opportunity unauthorized discharges of waste constituents from the Facility, or any impairment of beneficial uses that result from discharges of waste at the Facility. The Discharger shall report the results of all onsite monitoring in accordance with the operative MRP.

2. The Discharger shall conduct a water quality monitoring and response program in accordance with the operative MRP, including:

    a. Detection Monitoring. The Discharger shall institute a detection monitoring program pursuant to Title 27, section 20420.

    b. Evaluation Monitoring. The Discharger shall institute an evaluation monitoring program under Title 27, section 20425:

        i. Whenever there is “measurably significant” (as defined in section 20164) evidence of a release from the waste management unit under the detection monitoring program; or

        ii. Whenever there is significant physical evidence of a release from the waste management unit. Significant physical evidence of a release includes unexplained volumetric changes in surface impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the unit and any other change to the environment that could reasonably be expected to be the result of a release from the unit.

    c. Corrective Action Monitoring. The Discharger shall institute a corrective action monitoring program under Title 27, section 20430 when the Regional Water Board determines that the assessment of the nature and extent of the release and the design of a corrective action program have been satisfactorily completed.

3. **Sample Collection and Analysis Plan.** Within 90 days of the adoption of these WDRs, the Discharger shall submit, for review and approval by the Regional Water Board’s Executive Officer, a comprehensive Sample Collection and Analysis Plan (SCAP) that shall describe in detail the

methods to be used to perform all monitoring activities for all onsite features, including:

a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;

b. Sample preservation information and shipment procedures;

c. Sample analytical methods and procedures;

d. Sample quality assurance/quality control (QA/QC) procedures;

e. Chain of custody control; and

f. Sample analysis information including sample preparation techniques to avoid matrix interferences, method detection limits (MDLs), practical quantitation limits (PQLs) and reporting limits (RLs), and procedures for reporting trace results between the MDL and PQL.

4. Once the SCAP is approved, the Discharger may request changes to the approved SCAP, as needed, but shall use the procedures described in the approved SCAP until otherwise authorized by the Executive Officer.

E. Corrective Action Specifications

1. For all WMUs in a corrective action program to address a release from the unit, the Discharger shall implement all corrective measures necessary to remediate the release and to ensure that the Discharger achieves compliance with the Water Quality Protection Standard (as defined in the MRP) adopted for that unit. To confirm cleanup of all water-bearing media affected by the release, the Discharger shall complete the demonstration required under Title 27, section 20430(g).

2. The cessation of any corrective action measure (e.g., leachate, and groundwater extraction) is prohibited without written approval from the Executive Officer. If routine maintenance or a breakdown results in cessation of corrective action for greater than 24 hours, the Discharger shall notify Regional Water Board staff.

3. Following an earthquake that generates significant ground shaking (Modified Mercalli Intensity Scale V or greater) at or near the Facility, the Discharger shall submit a detailed post-earthquake inspection and corrective action plan. The plan shall address damage to and corrective measures for: containment structures; leachate control and stormwater

management systems; wells and equipment to monitor groundwater; and any other system/structure potentially impacted by static and seismic deformations of the WMU. The Discharger shall notify the Regional Water Board Executive Officer immediately, but no later than 24 hours, of damage to the WMUs due to an earthquake, and provide a post-earthquake inspection report within 15 business days.

F. Financial Assurances Specifications

1. The Discharger shall obtain and maintain adequate assurances of financial responsibility for closure, post-closure maintenance, and corrective action for all known and reasonably foreseeable releases from a waste management unit at the Facility in accordance with Title 27.

2. The Discharger shall demonstrate to the Regional Water Board that it has established acceptable financial assurance mechanisms described in subchapter 3 of Title 27, division 2, subdivision 1, chapter 6 in at least the amount of the cost estimates for closure and corrective action approved by the Executive Officer.

3. Corrective Action Financial Assurance. Within 90 days of the adoption of this Order, the Discharger shall submit to the Regional Water Board, in accordance with Title 27, section 22222, assurance of financial responsibility acceptable to the Executive Officer for initiating and completing corrective action for all known or reasonably foreseeable releases from the Brine Pond.

4. Closure Financial Assurance. Within 90 days of the adoption of this Order, the Discharger shall submit to the Regional Water Board, in accordance with Title 27, section 22207, an updated assurance of financial responsibility acceptable to the Regional Water Board’s Executive Officer for initiating and completing clean closure for the Brine Pond.

5. Yearly Financial Assurances Report. The Discharger shall submit, by June 1 of each year, a report calculating the increase in the cost estimates for closure, post-closure maintenance, and corrective action due to the inflation factor (specified in Title 27, § 22236) for the previous calendar year.

6. Documents supporting the amount and active status of the required financial assurance mechanisms shall be included in the Facility’s ROWD and revisions. Annual cost estimates and inflation factors shall be submitted to the Regional Water Board as an addendum to the ROWD.

G. Closure and Post-Closure Specifications

1. Prior to conducting Clean-Closure of the Brine Pond, the Discharger shall submit a Clean-Closure Plan to the Executive Officer for written approval.

2. Clean Closure activities shall be conducted in accordance with the Clean-Closure Plan approved by the Executive Officer in writing.

3. The Brine Ponds shall not be closed as a landfill without the adoption of Revised WDRs explicitly approving such closure activities.

H. Special Provisions

1. Spill Prevention Plan. Within 90 days of the adoption of this Order, the Discharger shall submit the Spill Prevention Plan for approval by the Regional Water Board's Executive Officer. The Discharger shall develop and implement a plan for immediate detection of leaks or failures in the aboveground pipelines carrying geothermal fluids. If an automatic pump is being used, an alarm or shutoff device shall be installed on the pump used in the pipelines. Pumping of geothermal fluids shall be suspended immediately following major pipeline failure. The plan shall include routine inspection of the entire length of the aboveground line in operation at the time, and the maintenance of an inspection log. Minor leaks shall be repaired immediately upon being identified. A sign should be posted to identify the fluid being pumped and alerting the public of the potential danger.

2. Geothermal Brine Spill Reporting. If leaks or failures in the aboveground pipelines carrying geothermal solution occur in excess of 150 gallons, or if there is any spill of geothermal fluid from the Brine Pond, the Discharger shall do the following:

    a. Orally report to the Regional Water Board office and the Office of Emergency Services within 24 hours of when the Discharger becomes aware of the incident. If noncompliance occurs outside of business hours, the Discharger shall leave a message on the Regional Water Board's office voicemail.

    b. Provide a written report within five business days of the time the Discharger becomes aware of the incident. The written report shall contain a description of the noncompliance and its cause, the period of noncompliance, the anticipated time to achieve full compliance, and the steps taken or planned, to reduce, eliminate, and prevent recurrence of the noncompliance. The Discharger shall

estimate the total volume as well as the vertical and horizontal extent of the spill/leak/release.

c. Submit a follow-up report within 30 days of receipt of final test results that includes confirmation sampling results indicating that cleanup goals have been achieved.

I. Standard Provisions

1. **Noncompliance.** The Discharger shall comply with all of the terms, requirements, and conditions of this Order and MRP R7-2023-0011. Noncompliance is a violation of the Porter-Cologne Water Quality Control Act (Water Code, § 13000 et seq.) and grounds for: (1) an enforcement action; (2) termination, revocation and reissuance, or modification of these WDRs; or (3) denial of an Order renewal application.

1. **Enforcement.** The Regional Water Board reserves the right to take any enforcement action authorized by law. Accordingly, failure to timely comply with any provisions of this Order may subject the Discharger to enforcement action. Such actions include, but are not limited to, the assessment of administrative civil liability pursuant to Water Code sections 13323, 13268, and 13350, a Time Schedule Order (TSO) issued pursuant to Water Code section 13308, or referral to the California Attorney General for recovery of judicial civil liability.

2. **Proper Operation and Maintenance.** The Discharger shall at all times properly operate and maintain all systems and components of collection, treatment, and control installed or used by the Discharger to achieve compliance with this Order. Proper operation and maintenance includes, but is not limited to, effective performance, adequate process controls, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities/systems when necessary to achieve compliance with this Order. All systems in service or reserved shall be inspected and maintained on a regular basis. Records of inspections and maintenance shall be retained and made available to the Regional Water Board on request.

3. **Reporting of Noncompliance.** The Discharger shall report any noncompliance that may endanger human health or the environment. Information shall be provided orally to the Regional Water Board office and the Office of Emergency Services within 24 hours of when the Discharger becomes aware of the incident. If noncompliance occurs outside of business hours, the Discharger shall leave a message on the Regional Water Board’s office voicemail. A written report shall also be

provided within five (5) business days of the time the Discharger becomes aware of the incident. The written report shall contain a description of the noncompliance and its cause, the period of noncompliance, the anticipated time to achieve full compliance, and the steps taken or planned, to reduce, eliminate, and prevent recurrence of the noncompliance. All other forms of noncompliance shall be reported with the Discharger's next scheduled Self-Monitoring Reports (SMRs), or earlier if requested by the Regional Water Board's Executive Officer.

4. **Duty to Mitigate.** The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment.

5. **Material Changes.** Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall report all pertinent information in writing to the Regional Water Board, and if required by the Regional Water Board, obtain revised requirements before any modifications are implemented. A material change includes, but is not limited to, the following:

    a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;

    b. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment);

    c. A change in the type of waste being accepted for disposal; or

    d. A change to previously-approved liner systems or final cover systems that would eliminate components or reduce the engineering properties of components.

2. **Familiarity with Order.** The Discharger shall ensure that all site-operating personnel are familiar with the content of this Order and maintain a copy of this Order at the site.

3. **Inspection and Entry.** The Discharger shall allow the Regional Water Board, or an authorized representative, upon presentation of credentials and other documents as may be required by law, to:

    a. Enter the premises regulated by this Order, or the place where records are kept under the conditions of this Order;

b. Have access to and copy, at reasonable times, records kept under the conditions of this Order;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

d. Sample or monitor at reasonable times, for the purpose of assuring compliance with this Order or as otherwise authorized by the Water Code, any substances or parameters at this location.

4. **Change in Ownership.** This Order is not transferable to any person without written approval by the Regional Water Board's Executive Officer. Prior to any change in ownership of this operation, the Discharger shall notify the Regional Water Board's Executive Officer in writing at least 30 days in advance. The notice must include a written transfer agreement between the existing owner and the new owner. At a minimum, the transfer agreement must contain a specific date for transfer of responsibility for compliance with this Order and an acknowledgment that the new owner or operator is liable for compliance with this Order from the date of transfer. The Regional Water Board may require modification or revocation and reissuance of this Order to change the name of the Discharger and incorporate other requirements as may be necessary under the Water Code.

5. **Monitoring Wells.** The Discharger shall comply with all notice and reporting requirements of the California Department of Water Resources and with any well permitting requirements imposed by a local agency regarding the construction, alteration, destruction, maintenance, or abandonment of any monitoring wells used for compliance with this Order and the accompanying MRP, as required under Water Code sections 13750 and 13755 and local agency requirements.

6. **Format of Technical Reports.** The Discharger shall furnish, under penalty of perjury, technical monitoring program reports, and such reports shall be submitted in accordance with California Code of Regulations, title 23, division 3, chapter 30, as groundwater raw data uploads electronically over the Internet into the State Water Board's GeoTracker database. Documents that were formerly mailed by the Discharger to the Regional Water Board, such as regulatory documents, narrative monitoring reports or materials, and correspondence, shall be uploaded into GeoTracker in the appropriate Microsoft Office software application format, such as Word or Excel files, or as a Portable Document Format

(PDF) file. Large documents must be split into appropriately labelled, manageable file sizes and uploaded into GeoTracker.

7. **Qualified Professionals.** In accordance with Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of California registered professionals (i.e., civil engineer, engineering geologist, geologist, etc.) competent and proficient in the fields pertinent to the required activities. All technical reports required under this Order that contain work plans, describe the conduct of investigations and studies, or contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal. Additionally, all field activities are to be conducted under the direct supervision of one or more of these professionals.

8. **Certification Under Penalty of Perjury.** All technical reports required in conjunction with this Order shall include a statement by the Discharger, or an authorized representative of the Discharger, certifying under penalty of perjury under the laws of the State of California, that the reports were prepared under his or her supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted, and that based on his or her inquiry of the person or persons who manage the system, the information submitted is, to the best of his or her knowledge and belief, true, complete, and accurate.

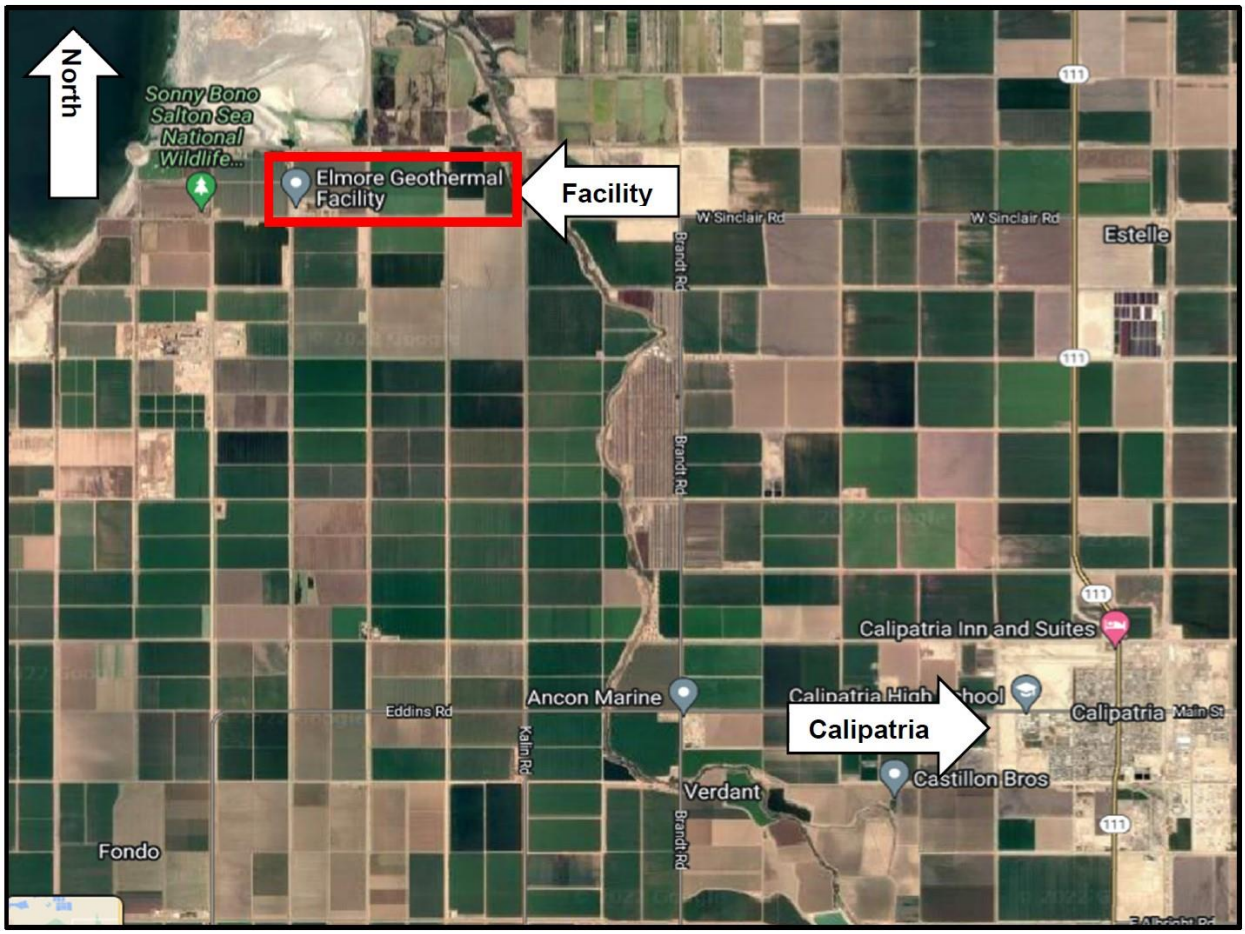
Any person aggrieved by this Regional Water Board action may petition the State Water Board for review in accordance with Water Code section 13320 and California Code of Regulations, title 23, section 2050 et seq. The State Water Board must receive the petition by 5:00 p.m. on the 30th day after the date of this Order; if the 30th day falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the statutes and regulations applicable to filing petitions are available on the State Water Board’s website and can be provided upon request.

Order Attachments

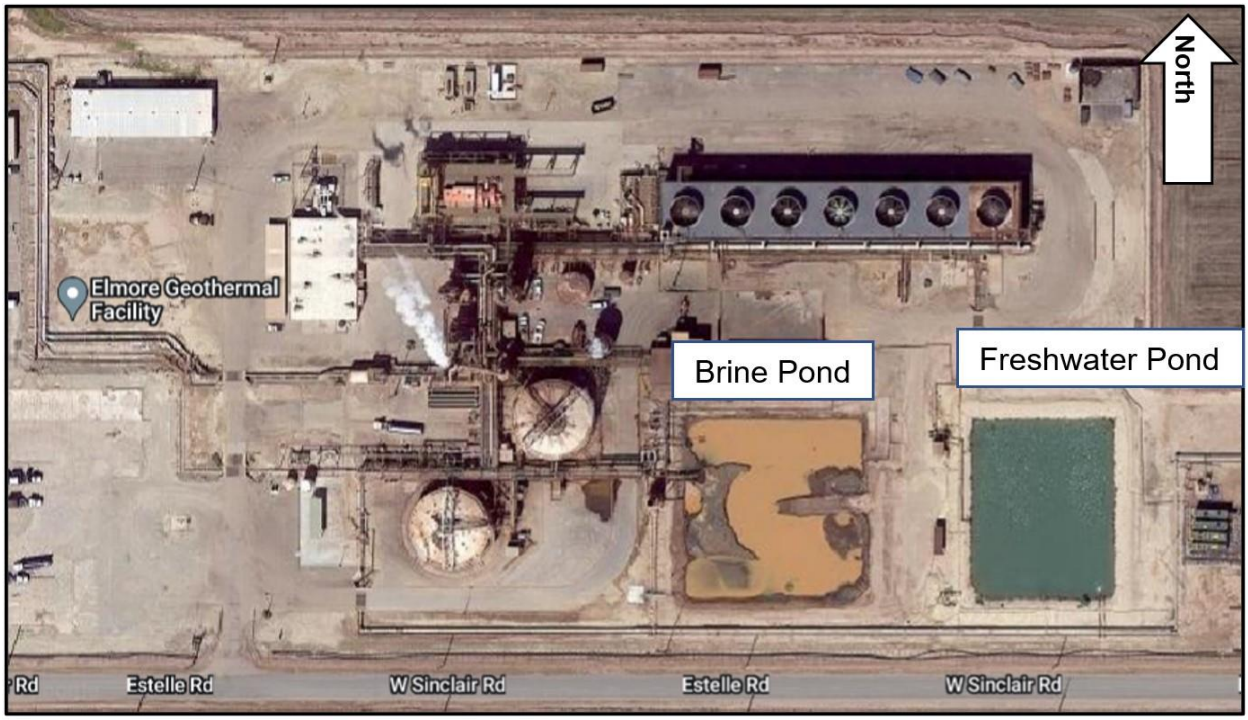
Attachment A—Facility Location Map
Attachment B—General Facility Map
Attachment C—Geothermal Solids Management Schematic
Attachment D—Schematic of Additional Filter Press at Pond
Attachment E—Schematic of Filter System at Edge of Pond
Attachment F—Monitoring Well Map

Monitoring and Reporting Program R7-2023-0011

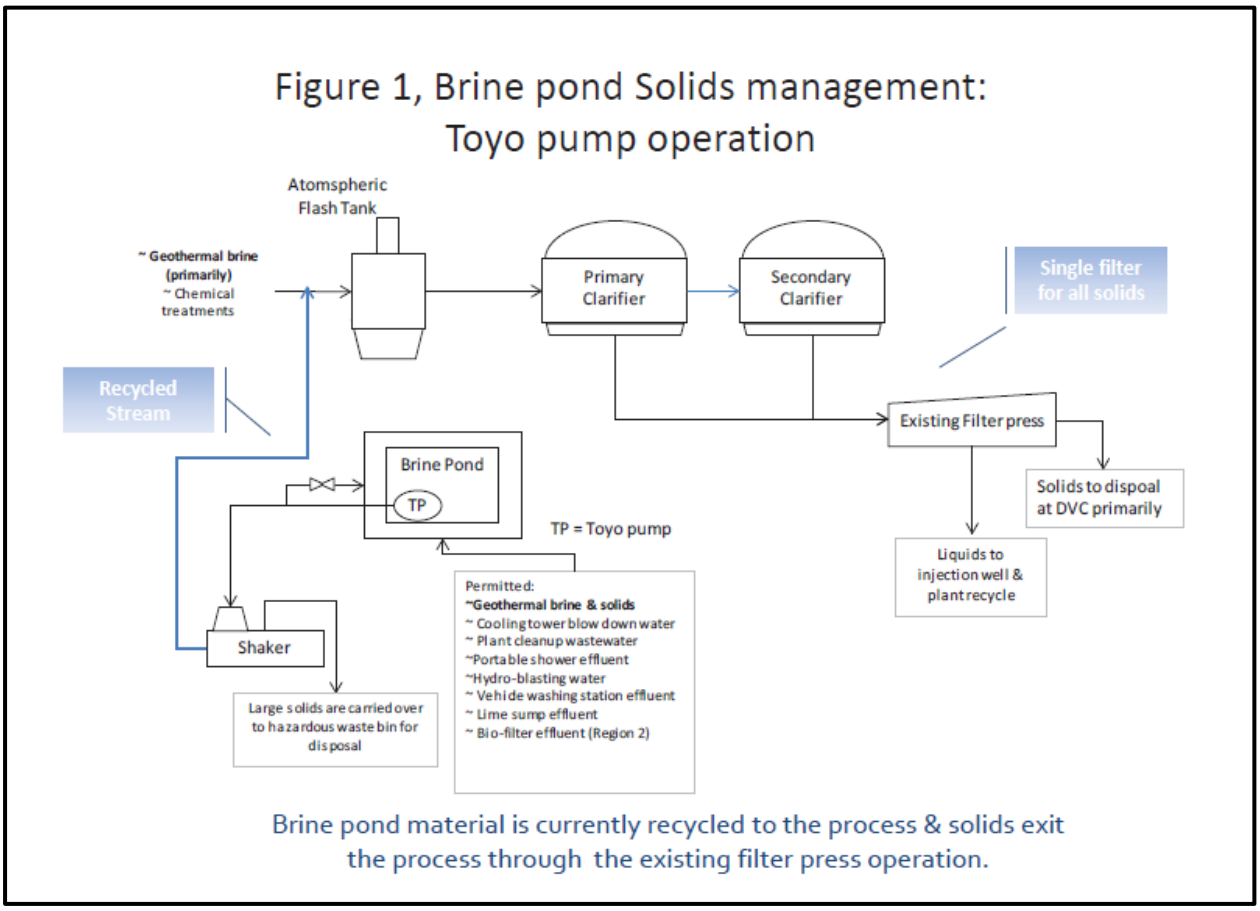
ATTACHMENT A—FACILITY LOCATION MAP



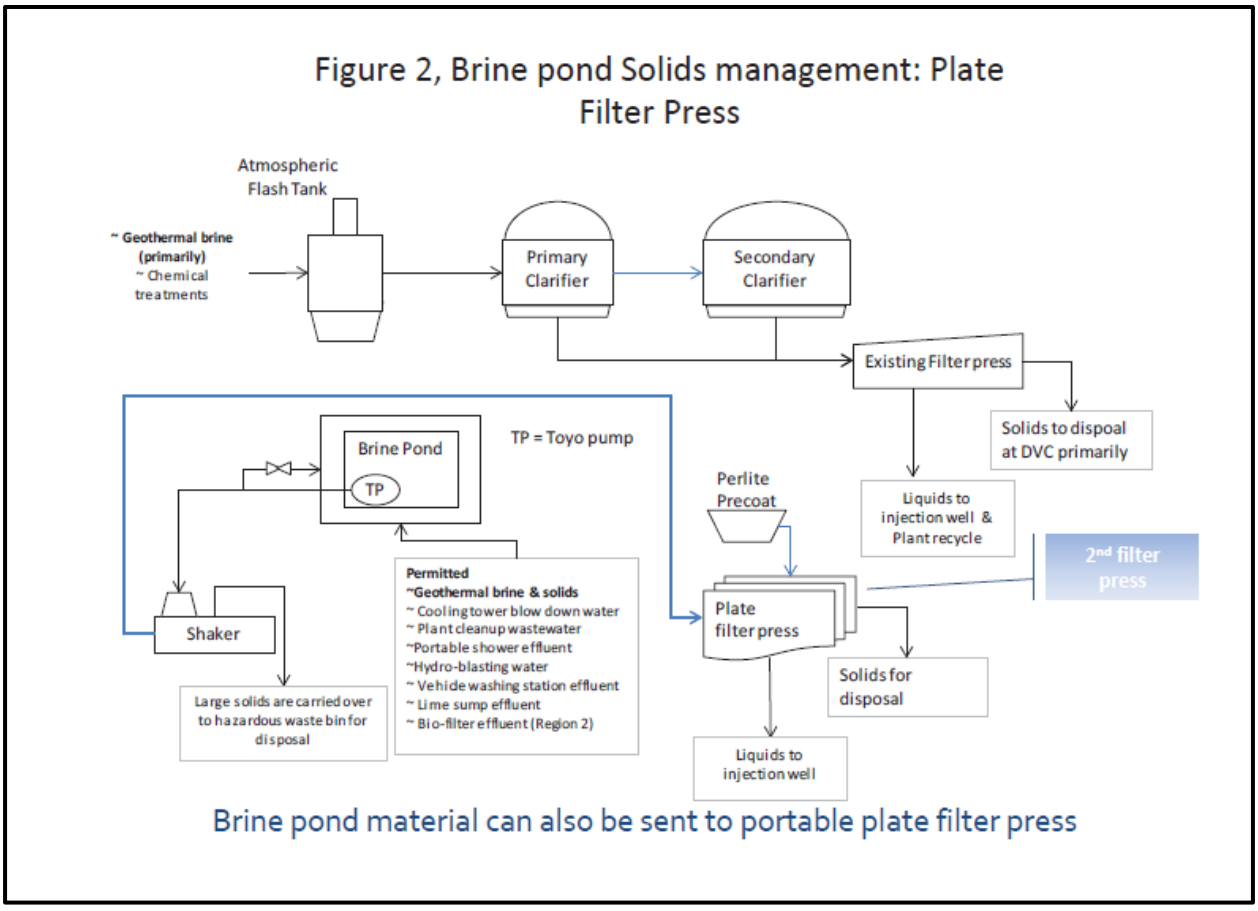
ATTACHMENT B—GENERAL FACILITY MAP



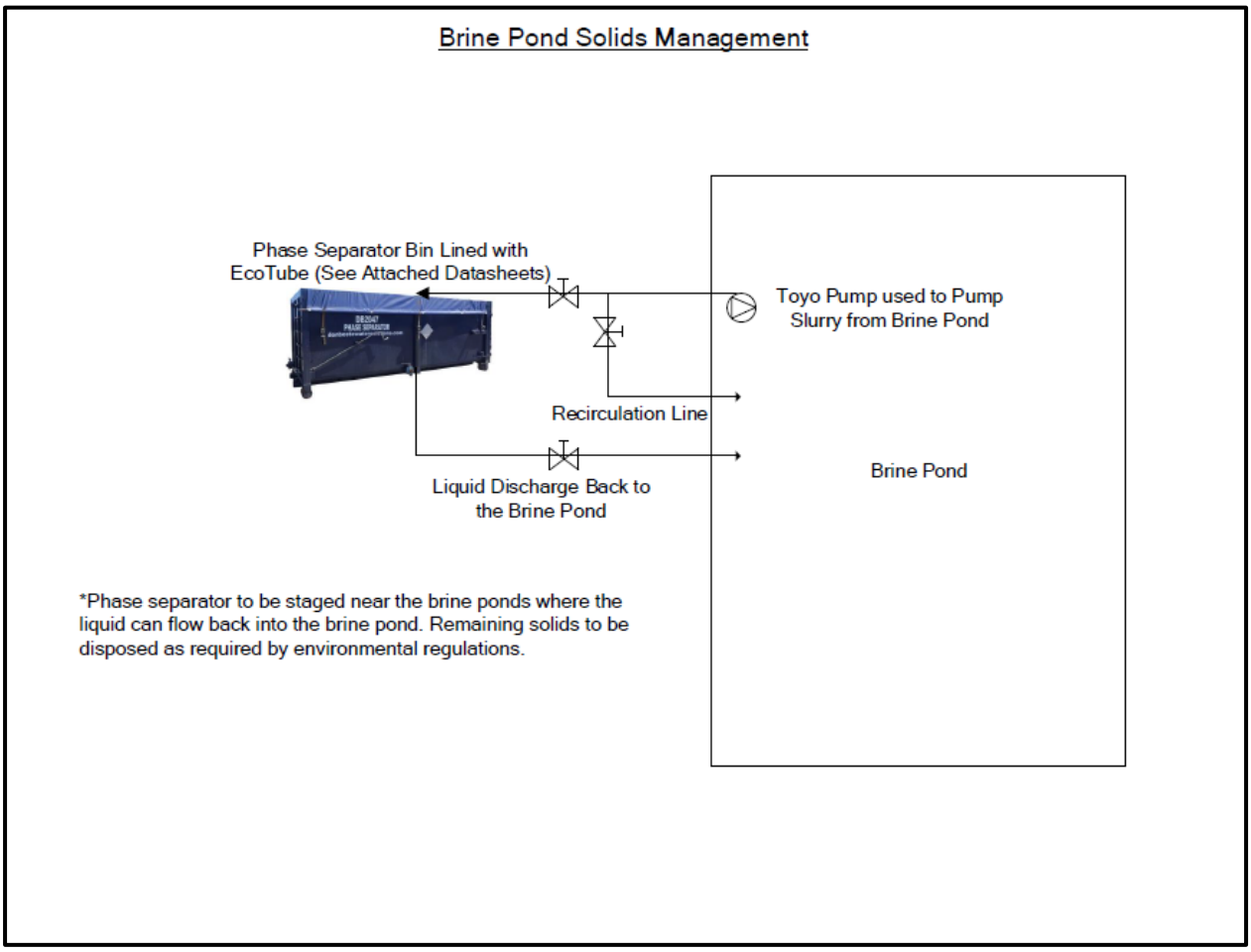
ATTACHMENT C—GEOTHERMAL SOLIDS MANAGEMENT SCHEMATIC



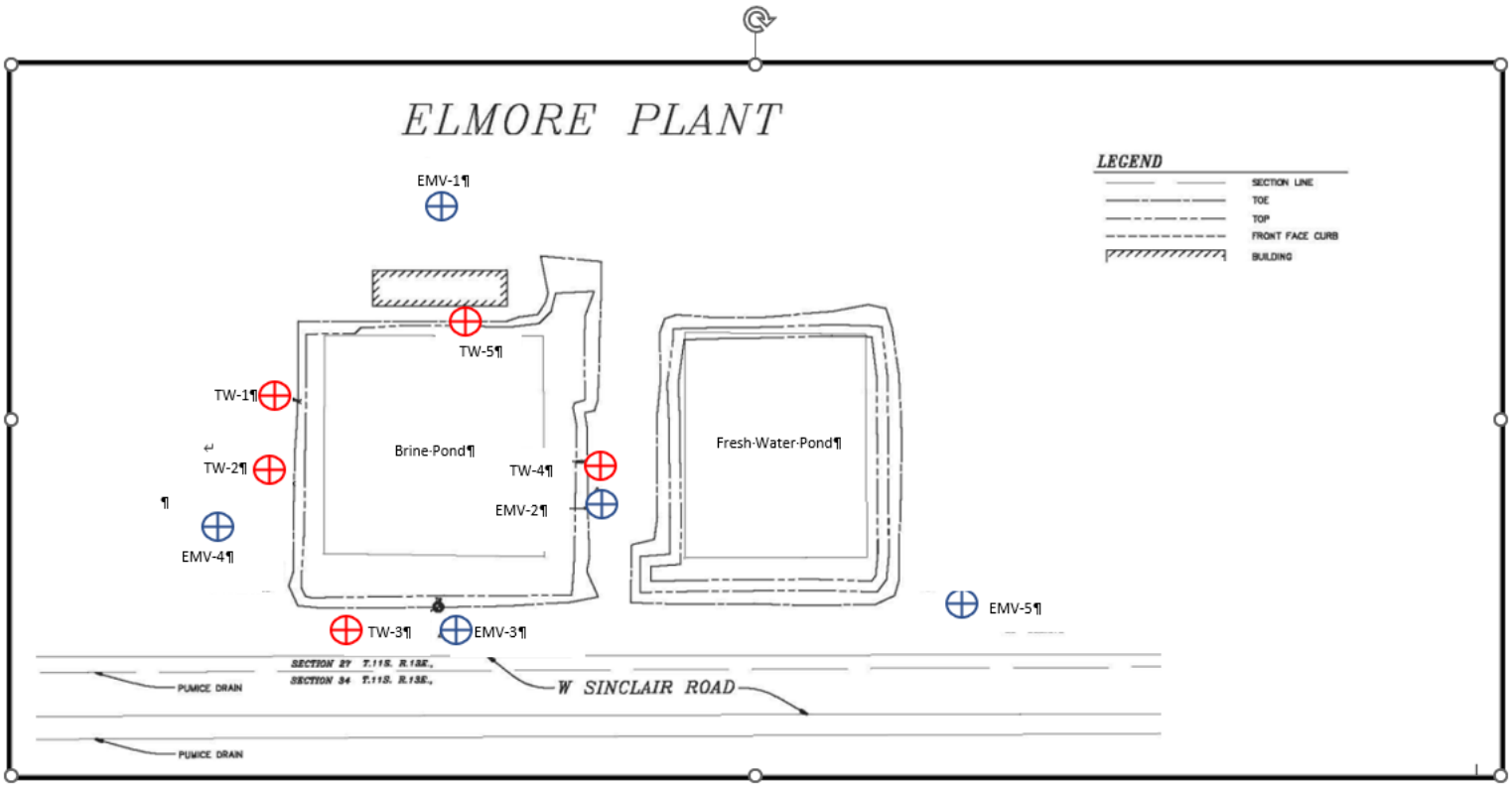
ATTACHMENT D—SCHEMATIC OF ADDITIONAL FILTER PRESS AT POND



ATTACHMENT E—SCHEMATIC OF FILTER SYSTEM AT EDGE OF POND



ATTACHMENT F—MONITORING WELL MAP



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM R7-2023-0011

For

CALENERGY OPERATING CORPORATION, OWNER
MAGMA POWER COMPANY, OPERATORS
J.J. ELMORE GEOTHERMAL POWER PLANT
CLASS II SURFACE IMPOUNDMENT
IMPERIAL COUNTY

Issued pursuant to Water Code section 13267, subdivision (b)(1), this Order establishes a Monitoring and Reporting Program (MRP) with monitoring and reporting requirements for Class II Surface Impoundments, alternatively referred to as Waste Management Units (WMUs), that are regulated under California Code of Regulations, title 27 (Title 27). This Order is required under Title 27, and is necessary to verify that CalEnergy Operating Corp. and Magma Power Co. (collectively, Discharger) are complying with Waste Discharge Requirements Order R7-2023-0011 (WDRs Order) with respect to WMUs at the J.J. Elmore Geothermal Power Plant (Facility). Under this MRP, the Discharger shall perform various monitoring activities to ensure detection of releases from the WMUs at the earliest possible opportunity. This MRP supersedes all previously-issued MRPs for the Facility.

PART I: SAMPLING AND ANALYSIS GENERAL REQUIREMENTS

A. Sampling and Analysis General Requirements

1. The Discharger shall submit a Sample Collection and Analysis Plan (SCAP) that incorporates the standard monitoring provisions below and describes the sampling and analysis protocols to be used for all monitoring activities. The SCAP must be received by the Regional Water Board within 90 days of adoption of the WDRs Order and this MRP.

2. Upon SCAP approval, the Discharger may request changes as needed, but shall use the procedures described in the approved SCAP until such changes are authorized in writing by the Executive Officer.

B. Standard Monitoring Provisions

1. **Analytical Methods.** Specific methods of analysis for monitored waste constituents shall be identified in the SCAP. If the Discharger proposes to use methods other than those in the latest edition of the U.S. Environmental Protection Agency's (USEPA) *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium* (SW-846) or *Guidelines Establishing Test Procedures for Analysis of Pollutants*,

40 C.R.R. part 136, the SCAP must explain the rationale for the change. The change must be approved by the Executive Officer prior to use.

2. **Monitoring Test Procedures.** The collection, preservation, and holding times of all samples shall be in accordance with protocols included in USEPA's SW-846 or 40 C.F.R. part 136, or as otherwise approved by the Regional Water Board. The Regional Water Board may, in its discretion, require methods more sensitive than those specified by USEPA.

3. **30-Day Sample Procurement Limitation.** For any given monitored medium, the samples collected from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be collected within a span not to exceed 30 days, unless a longer time period is approved by the Regional Water Board's Executive Officer and shall be collected in a manner that ensures sample independence to the greatest extent feasible. The 30-day limit does not apply to media that (1) are resampled to confirm the results of the initial round of samples, or (2) are resampled due to errors in the original sampling and analysis, but the Discharger shall conduct the resampling as expeditiously as practical.

4. **Laboratory Certification.** Unless otherwise approved by the Regional Water Board's Executive Officer, all analyses shall be conducted by a laboratory certified by the State Water Resources Control Board (State Water Board), Division of Drinking Water's Environmental Laboratory Accreditation Program (ELAP).

5. **Reporting Levels.** All analytical data shall be reported with method detection limits (MDLs) and with either the reporting level or limits of quantitation (LOQs) according to 40 C.F.R. part 136, Appendix B. The laboratory reporting limit for all reported monitoring data shall be no greater than the practical quantitation limit (PQL).

6. **QA/QC Data.** All quality assurance / quality control (QA/QC) data shall be reported, along with the sample results to which they apply, including the method, equipment, and analytical detection limits, the recovery rates, an explanation of any recovery rate that is less than 80 percent, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analyses, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recovery. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged, but the analytical results shall not be adjusted.

7. **Instrumentation and Calibration**. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated, as necessary, to ensure their continued accuracy. If continuous monitoring equipment is out of service for a period greater than 24 hours, the Discharger shall obtain representative grab samples each day the equipment is out of service. The Discharger shall correct the cause(s) of failure of the continuous monitoring equipment as soon as practicable. The Discharger shall report the period(s) during which the equipment was out of service and if the problem has not been corrected, shall identify the steps which the Discharger is taking or proposes to take to bring the equipment back into service and the schedule for these actions.

8. **Field Test Instruments.** Field test instruments (e.g., those used to test pH, dissolved oxygen, and electrical conductivity) may be used provided:

    a. The user is trained in proper use and maintenance of the instruments,

    b. The instruments are field calibrated prior to monitoring events at the frequency recommended by the manufacturer,

    c. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency, and

    d. Field calibration reports are submitted.

9. **Records Retention.** The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, for a minimum of five years from the date of the sampling or measurement. This period may be extended by request of the Executive Officer at any time. Records of monitoring information shall include:

    a. The date, exact place, and time of sampling or measurement(s);

    b. The individual(s) who performed the sampling or measurement(s);

    c. The methods used for groundwater purging/sampling;

    d. The date(s) analyses were performed;

    e. The individual(s) who performed the analyses;

    f. The analytical techniques or method used; and

g. All sampling and analytical results, including:

i. units of measurement used,

ii. minimum reporting limit for the analyses,

iii. results less than the reporting limit but above the method detection limit (MDL),

iv. data qualifiers and a description of the qualifiers,

v. quality control test results (and a written copy of the laboratory quality assurance plan),

vi. dilution factors, if used, and

vii. sample matrix type.

PART II: SITE-SPECIFIC MONITORING REQUIREMENTS

This part describes the site-specific monitoring program requirements to be implemented for the Facility and is organized by the type of monitoring to be performed. The methods used shall be as described in the approved SCAP. The site-specific monitoring program of this MRP includes:

MRP Table 1—Summary of Site-Specific Monitoring

Section	Monitoring Program
A	Groundwater Monitoring
B	Unsaturated/Vadose Zone Monitoring
C	Surface Water Monitoring
D	Surface Impoundment Monitoring
F	Evaluation Monitoring
G	Corrective Action Monitoring

A. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. Monitoring shall be performed in accordance with the locations, frequencies, and parameters described below.

1. **Monitoring Well Locations.** One well (EMV-5) is located several hundred feet away from the Brine Pond and is considered a background monitoring point, however it has historically exhibited a different groundwater chemical signature than the other monitoring wells and is therefore likely not representative of the other monitoring points. Therefore, the Discharger has proposed to use the intrawell method (versus interwell) for the determination of a measurable release from the Class II Surface Impoundment. The groundwater flow direction is predominantly NNW, towards the topographical low point, the Salton Sea. The other monitoring wells shall also use the intrawell method. The groundwater monitoring network consists of the monitoring wells **MRP Table 2** and any new monitoring wells added at the Facility (as approved by the Regional Water Board's Executive Officer).

MRP Table 2—Monitoring Wells Summary

Well	Location	Status	Frequency
EMV-1	North of Pond	Detection	Semi-Annually
EMV-2	East of Pond	Detection	Semi-Annually
EMV-3	South of Pond	Detection	Semi-Annually
EMV-4	West of Pond	Detection	Semi-Annually
EMV-5	Eastern Portion of Facility	Background	Semi-Annually

2. **Parameters/Constituents Monitored.** Groundwater samples shall be collected from the detection monitoring wells and any additional wells added as part of the approved groundwater monitoring system. The

collected samples shall be analyzed for the Monitoring Parameters specified below per the specified methods and frequencies.[7]

3. **Monitoring Parameters.** "Monitoring Parameters" shall consist of the (1) Field Monitoring Parameters and (2) Laboratory Monitoring Parameters specified below:

   a. Field Monitoring Parameters – During each groundwater monitoring event (Title 27, § 20415, subd. (e)(13)), the Discharger shall measure the field parameters listed in **MRP Table 3**.

   b. Laboratory Monitoring Parameters –Semiannually (2x/yr.), the Discharger shall, at a minimum, analyze the parameters listed below in **MRP Table 4**.

4. **Five-Year Constituents of Concern.** In addition to the Monitoring Parameters listed above, groundwater samples shall be analyzed at least once every five years for the additional Constituents of Concern (COC) listed in **MRP Table 5**, with the next monitoring event to be performed in **2027**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

[7] "**Monitoring Parameters**" and "**Constituents of Concern**" shall have the meaning specified in Title 27, section 20164. "Monitoring Parameters" means the group of constituents specified below and includes physical parameters, waste constituents, reaction products, and hazardous constituents that provide a reliable indication of a release from a WMU. "Constituents of Concern" (COCs) include a larger group of waste constituents and mean any waste constituents, reaction products, and hazardous constituents reasonably expected to be in or derived from waste contained in a WMU.

MRP Table 3—Field Parameters Monitoring

Parameter	Unit
pH	pH units
Depth to groundwater	Feet Below Elevation Datum
Depth to the bottom of the well	Feet Below Elevation Datum
Groundwater density	Kg/L
Groundwater elevation[8]	Feet above sea level (USGS Datum)
Specific conductance	Micromhos/cm
Temperature	Degrees F

[8] Semi-annual measurement of groundwater elevations is approved pursuant to Title 27, section 20380(e), allowing engineered alternatives provided they achieve the goals of the monitoring program.

MRP Table 4—Laboratory Monitoring Parameters Monitoring

Constituents	Units	Sample Type	Reporting Freq.
Total Dissolved Solids (TDS)	mg/L	Grab	Semi-Annually
Arsenic	µg/L	Grab	Semi-Annually
Barium	µg/L	Grab	Semi-Annually
Cadmium	µg/L	Grab	Semi-Annually
Lead	µg/L	Grab	Semi-Annually
Zinc	µg/L	Grab	Semi-Annually

MRP Table 5—List of 5-Year COCs

Constituent
General Chemistry (Ca, Mg, Na, K, SO_4, Cl, HCO_3)
17 Heavy Metals (Cal. Code Regs., tit. 22, § 66261.24 / CAM 17)

B. Unsaturated Zone Monitoring

There is no unsaturated/vadose zone action monitoring program required at this time. Groundwater is known to exist 5-15 feet beneath ground surface (seasonal fluctuations).

C. Surface Water Monitoring

Perennial streams are not located at the Facility and the occurrence of surface water should be limited to (1) immediately after significant storm events, and (2) if seeps develop along the perimeter of the Brine Pond .

1. **Observed Surface Water Monitoring.** If surface water is observed near a WMU, the source of the surface water shall be identified, and observations of the following shall be included in the next Semi-Annual Monitoring Report:

    a. Flow rate and source of water;

b. Floating and suspended materials of waste origin: Presence or absence, source, and size of affected area;

c. Discoloration and turbidity: Description of color, source, and size of affected area;

d. Evidence of odors: Presence or absence, characterization, source, and distance of travel from source; and

e. Weather conditions: Wind direction and estimated velocity, total precipitation during the previous five (5) days and on the day of observation.

2. Seep Monitoring. If a seep is identified in proximity to a WMU:

a. The location, flow rate, and other characteristics (such as color and odor) shall be orally reported to the Regional Water Board within **48 hours**, and a written report concerning the seep shall be submitted to the Regional Water Board **within seven (7) days**.

b. Flow from the seep shall be contained to preclude the seep from adversely affecting surface waters.

c. A sample of the seepage shall be collected and tested for the Field Monitoring Parameters described in Part II.A.2.a.I.

d. If the Field Monitoring Parameters indicate the seepage is not groundwater, or if it is unlikely the source of the seep is groundwater, the sample shall be analyzed for the Monitoring Parameters and 5-Year COCs described in Part II.A.2.a and b.

e. The results of all testing shall be reported to the Regional Water Board **within seven days** of receipt of the written laboratory report.

f. Seeps that continue to exist for more than one reporting period shall be monitored during each reporting period and the results shall be included in the Semi-Annual Monitoring Report.

D. Surface Impoundment Monitoring

1. **Pond Capacity Monitoring.** The Brine Pond shall be monitored at least monthly and included in the Semi-Annual Monitoring Report for the following:

a. The available freeboard in each pond and/or pond cell.

b. The average monthly volume and maximum monthly volume of wastewater and/or freshwater discharged into the surface impoundments in gallons.

c. The average daily volume and maximum daily volume of wastewater and/or freshwater removed from the surface impoundment in gallons.

d. Observations of erosion, settlement, and/or subsidence along the visible areas of the surface impoundment(s), including the top of the berm, outer slopes, and upper region of the inner slope. Repairs shall be performed as needed and documented in the inspection logs.

2. **Geothermal Solids Monitoring.** When solid geothermal waste is removed from the Brine Pond for final disposal at a proper facility, the solid waste shall be monitored and sampled in accordance with **MRP Table 6** and **MRP Table 7**, and the information shall be included in each Semi-Annual Monitoring Report:

MRP Table 6—Geothermal Solids Monitoring

Parameter	Unit	Reporting Frequency	Monitoring Frequency
Volume of solids removed	Tons	Semi-Annually	Monthly
Location of final disposal	Facility Name	Semi-Annually	Monthly
Volume of solids/liquids contained	Gallons	Semi-Annually	Monthly

MRP Table 7—Geothermal Solids Sampling

Constituents	Units	Sample Type	Reporting Freq.
Arsenic	µg/kg	Grab	Semi-Annually
Barium	µg/kg	Grab	Semi-Annually
Cadmium	µg/kg	Grab	Semi-Annually
Lead	µg/kg	Grab	Semi-Annually

Constituents	Units	Sample Type	Reporting Freq.
Zinc	µg/kg	Grab	Semi-Annually

3. **Geothermal Wastewater Monitoring.** Samples of wastewater shall be collected from the Brine Pond and analyzed in accordance with **MRP Table 8** below.

MRP Table 8—Class II Surface Impoundment Monitoring

Constituents	Units	Sample Type	Reporting Freq.
pH	mg/L	Composite	Semi-Annually
Total Dissolved Solids	mg/L	Composite	Semi-Annually
Specific Conductance	mg/L	Composite	Semi-Annually
Arsenic	µg/L	Grab	Semi-Annually
Barium	µg/L	Grab	Semi-Annually
Cadmium	µg/L	Grab	Semi-Annually
Lead	µg/L	Grab	Semi-Annually
Zinc	µg/L	Grab	Semi-Annually
General Chemistry (Ca, Mg, Na, K, SO_4, Cl, HCO_3)	mg/L	Composite	Annually

4. LCRS Monitoring

   a. The Discharger shall test each LCRS annually to demonstrate proper operation. (See Title 27, § 20340, subd. (d).) Except for the first annual test, the results of this testing shall be compared to earlier tests made under comparable conditions.

   b. If LCRS has a high-water alarm system that is functioning properly, the Facility shall monitor the height of liquid in each LCRS sump at least **quarterly** to an accuracy of one-quarter (1/4) inch. If the alarm system is not functioning properly, the frequency of this monitoring shall be **weekly**. The Discharger shall record the data in

the monitoring logs and include the data in the Semi-Annual Monitoring Report.

c. The Discharger shall measure the electrical conductivity and pH of any liquid in the sumps **quarterly**.

d. The Discharger shall remove fluids from the LCRS sumps as often as needed to prevent the liquid in the sump from backing up into the collection portion of the LCRS. The removed liquid may be discharged back into the surface impoundment for that sump. The volume removed shall be measured and used to identify the leakage rate into each sump. The removal dates, volumes, and calculated leakage rates shall be included in the Semi-Annual Monitoring Report.

e. If an automated sump-pump is installed, an alarm shall also be installed to indicate if the sump fills beyond the upper limit of the sump-pump settings. Automated systems shall also include a means of monitoring changes in the height of liquid in the sump and measuring the frequency and volume of pumping. This data shall be converted to a daily leakage rate and summarized in the Semi-Annual Monitoring Report. Automated sump pumps shall be tested at least annually to ensure they are functioning properly.

If leakage rates exceed the reporting threshold (RT), which shall be by default one half of the LCRS sumps total volume or a site specific/LCRS-specific value that is determined based off of historical performance of a LCRS and that has been approved by the Executive Officer in writing. the Discharger shall follow the steps in Part II.E.3 – Excessive Leachate Production. The default RT for this Facility's five LCRS sumps, within a 24-hour period, shall be specified in **MRP Table 9** below.

A workplan describing proposed changes to the LCRS monitoring system shall be submitted to the Regional Water Board for review and approval prior to implementing any proposed changes.

MRP Table 9—Reporting Thresholds for LCRS Sumps

Sump #	Reporting Threshold (Gallons per day)
Sump 1	220
Sump 2	220
Sump 3	220
Sump 4	220
Sump 5	220

E. Evaluation Monitoring

1. **Notification of a Release.** Should the Discharger discover a release from the Facility, the Discharger shall:

   a. **Initial Notification.** Notify the Regional Water Board by phone or e-mail **within 24 hours**, and by mail **within seven days**, when the Discharger determines from monitoring results that there is measurably significant evidence of a release. (Title 27, § 20420, subd. (j)(1).)

   b. **Retest.** The Discharger may immediately initiate the verification procedure specified in Part III.B.3 to verify that there is "measurably significant" evidence of a release of a particular constituent.[9] (Title 27, § 20420, subd. , subd. (j)(2).)

   c. **Notice to Nearby Landowners.** The Discharger shall, **within 14 days** of confirming measurably significant evidence of a release, notify all persons who own the land or reside on the land that directly overlies any portion of the plume of contamination, if sampling of detection monitoring wells indicates contaminants have migrated off-site. (40 C.F.R. § 258.55(g)(1)(iii).)

[9] Under California Code of Regulations, title 27, section 20420(k)(7), the Discharger may also demonstrate that a source other than the waste management unit caused the release.

2. **Evaluation of a Release.** If the Discharger determines that a previously unknown release from the Facility has occurred, the following actions shall be taken:

   a. **Non-Statistical COC Scan.** If the detection was made based upon sampling and analysis for Monitoring Parameters, the Discharger shall immediately sample all monitoring points in the affected medium at that waste management unit and determine the concentration of all Monitoring Parameters and Constituents of Concern for comparison with established concentration limits. Because this scan does not involve statistical testing, the Discharger will only need to collect and analyze a single water sample from each monitoring point in the affected medium. (Title 27, § 20420, subd. (k)(1).)

   b. **Amended ROWD for Evaluation Monitoring Program (EMP).** The Discharger shall, **within 90 days** of confirming a measurably significant evidence of a release, submit an amended Report of Waste Discharge (ROWD) proposing an evaluation monitoring program that meets the requirements of California Code of Regulations, title 27, sections 20420(k)(5) and 20425. The evaluation monitoring program shall be designed for the collection and analysis of all data necessary to assess the nature and extent of the release and to determine the spatial distribution and concentration of each constituent throughout the zone affected by the release. (Cal. Code Regs., tit. 27, §§ 20420, subd. (k)(5) and 20425(b).) For releases from municipal solid waste (MSW) landfill units, the evaluation monitoring program shall also include any additional proposals necessary to comply with 40 C.F.R. § 258.55, particularly the additional monitoring wells required by 40 C.F.R. § 258.55(g)(1)(ii). Additionally, the Discharger shall add any 5-Year COC for which there is a confirmed measurably significant release to the list of Monitoring Parameters.

   c. **Preliminary Engineering Feasibility Study (EFS).** The Discharger shall, **within 180 days** of confirming a measurably significant evidence of a release, submit to the Regional Water Board a preliminary engineering feasibility study (EFS) report for a corrective action program that meets the requirements of California Code of Regulations, title 27, sections 20420(k)(6) and 20430. At a minimum, the feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all COCs.

d. **Additional EMP Required Actions.** The Discharger shall, **within 90 days** of establishing an evaluation monitoring program (i.e., from the date of Regional Water Board approval of the program), complete and submit the following:

i. A report with the results and assessment/delineation of the release based on the approved evaluation monitoring program. (Cal. Code Regs, tit. 27 § 20425(b).)

ii. An updated engineering feasibility study for corrective action based on the data collected to delineate the release and data from the ongoing monitoring program required under title 27, section 20425(e). (Title 27, § 20425(c).)

iii. An amended ROWD to establish a corrective action program meeting the requirements of title 27, section 20430 based on the data collected to delineate the release and based on the updated engineering feasibility study. (Title 27, § 20425(d).)[10]

3. Excessive Leachate Production

a. If leakage rates in any LCRS sump exceed the default reporting threshold (RT) of 220 gallons per day, or a site-specific RT that has been approved by the Executive Officer, the Discharger shall report this to the Regional Water Board within **48 hours** and propose further actions to evaluate whether repairs are needed. Unless a Facility-specific RT is approved by the Regional Water Board, the default RT shall be one half of the volume of the sump per day.

b. The first instance liquid is found in the LCRS sump:

i. The Regional Water Board shall be notified verbally within **seven days**, and

ii. Collect at least one sample of the leachate within **30 days** and analyze it for the Monitoring Parameters and 5-Year COCs used for groundwater monitoring.

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[10] The Discharger shall (for releases from MSW landfill units) discuss the results of the updated engineering feasibility study, prior to the final selection of a remedy, in a public meeting with interested and affected parties. (40 C.F.R. § 258.56(d).)

F. Corrective Action Monitoring

There is no corrective action monitoring program required at this time.

PART III: EVALUATION OF MONITORING DATA

Part III of this MRP provides the requirements for the analysis of detection, evaluation, and corrective action monitoring data collected from monitoring wells associated with the Facility.

A. Water Quality Protection Standard

The Water Quality Protection Standard (WQPS or Water Standard) consists of all COCs (§ 20395), the concentration limit for each COC (§ 20400), and the points of compliance for each monitored medium (§ 20405) for the duration of the compliance period (§ 20410).

1. **Constituents of Concern (COCs).** The COCs are as defined above in Part II.A.2 and include both Monitoring Parameters and Five-Year Constituents of Concern (5-Year COCs).

2. Concentration Limits

a. Default Limits. The following concentration limits shall apply, unless the Regional Water Board approves a Concentration Limit Greater than Background (CLGB), as provided in Part III.A.2.b below:

b. Non-natural Constituents. For COCs that are not naturally occurring, the concentration limit shall be the detection limit of the laboratory testing procedure.

c. Naturally-Occurring Constituents. For naturally-occurring COCs, the concentration limit shall be the background concentration determined through either inter-well or intra-well comparisons.

d. CLGB. Use of a CLGB may be proposed by the Discharger provided it is justified through a statistical analysis of relevant data (including the background dataset) and a demonstration that background concentrations would not be technologically or economically feasible for the COCs for a given monitoring well. (Title 27, § 20400, subd. (c).) A concentration limit greater than background will only be considered for COCs present in monitoring

wells associated with corrective action monitoring. (Title 27, § 20400, subd. (h).)

e. **Procedure for Approval of Concentration Limits.** The Discharger shall submit a report proposing applicable background concentrations for each COC under Part III.A.2.a in the next Annual Monitoring Report. The Regional Water Board will review proposed concentration limits from the Discharger and approve, modify, or disapprove each proposed limit. (Title 27, § 20400.) Following initial approval of the concentration limits, the Discharger shall reevaluate and propose any updates to the concentration limits **every five years** thereafter.

3. **Compliance Period.** The compliance period for each waste management unit includes the active life of each waste management unit, the closure period, the post-closure maintenance period, and any compliance period under Title 27, section 20410.

4. **Points of Compliance.** All monitoring wells established for the detection monitoring program shall constitute the points of compliance for the Water Standard.

B. Statistical and Non-Statistical Analysis of Data

1. General Requirements

a. Title 27, section 20415, subdivision (e) describes a range of statistical and non-statistical data analysis methods that can be used to evaluate data collected during monitoring. In addition, USEPA published *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (EPA 530/R-09-007) in 2009.

b. The Discharger shall evaluate the data obtained during a monitoring period using either a statistical or non-statistical method described in Title 27 or may propose another method for approval by the Regional Water Board's Executive Officer, as long as it achieves the goal of the monitoring program at least as well as the most appropriate method described in title 27, section 20415.

c. The Discharger shall propose data analysis methods to be used in evaluating water quality monitoring data for each COC. (Title 27, § 20415, subd. (e)(7).) The specifications for each data analysis method shall include a detailed description of the criteria to be used

for determining “measurably significant” (as that term is defined in title 27, section 20164) evidence of any release from the waste management unit and for determining compliance with the Water Quality Protection Standard.

d. Monitoring reports shall describe the statistical or non-statistical method used for each COC at each monitoring point.

2. Background Values

a. Pursuant to Title 27, section 20415, subdivision (e)(10), the Discharger shall in a technical report justify the use of a procedure for determining the background value for each COC.

b. Inter-well comparisons may be used where upgradient and downgradient wells intercept the same aquifer and are expected to have similar concentrations of naturally occurring constituents. Intra-well comparisons shall be used where uncontaminated background wells are not present, or the chemical composition of upgradient and downgradient wells are significantly different.

c. In establishing COC background values, the Discharger shall ensure that sampling methods used comply with Title 27, section 20415, subdivision (e)(12), including that the number and kinds of samples collected must be appropriate for the form of data analysis employed and, in the case of statistical data analysis, follow generally accepted statistical principles. The sampling method (including the sampling frequency and the interval of time between successive samples) shall be appropriate for the medium from which samples are taken (e.g., groundwater, surface water, and soil-pore liquid). (See Title 27, § 20415, subd. (e)(6).) For groundwater, sampling shall be scheduled to include the times of expected highest and lowest elevations of the potentiometric surface.

3. Determination of Measurably Significant Evidence of a Release

a. **Initial Determination of Measurably Significant Evidence of a Release.** The Discharger shall use a statistical or nonstatistical data analysis method that complies with Title 27, section 20415, subdivision (e)(7)-(10) to compare the concentration of each COC with its respective background concentration to determine whether there has been measurably significant evidence of a release from the waste management unit. Whenever a COC is detected at a

detection monitoring point at a concentration that exceeds the concentration limit from the Water Standard, the Discharger shall preliminarily conclude that there is measurably significant evidence of a release and follow the notification procedures in Part II.E.1. (Title 27, § 20420, subd. (i).)

b. **Confirmation of a Measurably Significant Evidence of Release.** If there is a preliminary indication of a release, within **30 days** of such indication (Title 27, § 20415, subd. (e)(8)(E)(3)), the Discharger may implement a verification procedure/retest option in accordance with Ttle 27, section 20415(e)(8)(E).[11]

i. **Retest Method.** The verification procedure shall include either: (1) a single "composite" retest (i.e., a statistical analysis that augments and reanalyzes the data from the monitoring point that indicated a release), or (2) at least two "discrete" retests (i.e., statistical analyses, each of which analyzes only newly acquired data from the monitoring point that indicated a release). (Title 27, § 20415, subd. (e)(8)(E).) The Discharger may use an alternate method with prior approval by the Regional Water Board that complies with the requirements of title 27, section 20415, subdivision (e)(8)(E) in addition to the performance standards of subdivision (e)(9).

ii. **Retest Samples.** The retest samples shall be collected from the monitoring point where the release is preliminarily indicated and shall be analyzed for the constituents that caused the need for the retest. (Title 27, § 20415, subd. (e)(8)(E)(7).)

iii. **Retest Reporting.** The Discharger shall report to the Regional Water Board the results of both the initial statistical test and the results of the verification procedure, as well as all concentration data collected for use in these tests, **within seven days** of the last laboratory analysis of the samples collected for the verification procedure. (Title 27, § 20415, subd. (e)(8)(E)(6).)

If the retest results of one or more of the retest data suites

[11] Under Title 27, section 20420(k)(7), the Discharger may also demonstrate that a source other than the WMU caused the release.

confirm the original indication, the Discharger shall conclude that measurably significant evidence of a release has been confirmed. The Discharger shall then follow the procedures identified in Part II.E.2.

PART IV: REPORTS TO BE FILED WITH THE REGIONAL WATER BOARD

Part IV provides a description of the reports required to be submitted to the Regional Water Board for the Facility.

A. Required Reports

1. **Semi-Annual Monitoring Reports** – For each monitored medium, all monitoring results shall be reported semi-annually. Semi-Annual Monitoring Reports shall include, at a minimum, the following:

    a. **Topographic Map.** A topographic map (or copy of an aerial photograph), at an appropriate scale, identifying the Facility, the locations of observation stations, monitoring points, background monitoring points, and the groundwater elevation contours with interpreted groundwater flow direction and gradient.

    b. **Groundwater Elevations.** The method and time of groundwater elevation measurements, a description of the method used to purge the well and collect groundwater samples, and quality assurance/quality control (QA/QC) procedures used. The groundwater elevations shall be corrected for groundwater density using field measurements of groundwater density, depth to groundwater and depth to the bottom of the wells. A figure depicting the groundwater elevation contours, corrected for density, shall be included in the report.

    c. **Field Logs.** Field logs used during well purging and sampling. At a minimum, the field logs should include the following:

        i. The well number,

        ii. The sampling date and time,

        iii. The method of monitoring Field Monitoring Parameters and calibration of equipment used to monitor Field Monitoring Parameters,

iv. The purge method (if a pump is used, include the depth of pump placement in each well and the pumping rate), and

v. The purge and sample collection information such as: date each well was purged; well recovery time; method of disposal of the purged water; an estimate of the volume of water purged from each well; the results of all field analyses; depth to groundwater prior to purging, at the conclusion of purging, and when the sample was collected; the method of measuring the water level; and field personnel names and signature.

d. **Data Tables.** Cumulative tabulated monitoring data for all monitoring points and constituents (including the Monitoring Parameters and 5-Year COCs). Concentrations below the laboratory reporting limit shall not be reported as "ND," unless the reporting limit is also given in the table. Otherwise, they shall be reported "<" next to the reporting limit (e.g., <0.10). Upon request of Regional Water Board staff, data files shall be provided electronically in a file format approved by the Regional Water Board. Any electronic files submitted to the Regional Water Board in accordance with the WDRs Order and this MRP, shall not be password protected.

e. **Graphical Display.** For monitoring wells in corrective action or evaluation monitoring, a graphical display of groundwater concentrations for all COCs for which there is measurably significant evidence of a release, including all historical data for those COCs from at least 5 years prior to the detection of a release at that location. Each graph shall plot the concentration of one or more constituents at an appropriate scale that allows changes in concentrations to be discerned, including the use of a semi-log scale for concentrations that change by more than three orders of magnitude.

f. **Summary of Groundwater Conditions.** A written summary of the monitoring results and any changes to the groundwater monitoring system since the previous report. The written summary shall include a discussion of the groundwater flow rate and direction,[12]

[12] The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report. (Cal. Code Regs., tit 27, § 20415(e)(15).)

the appearance of trends or other information that may indicate a potential change in the hydrogeologic conditions beneath and adjacent to the Facility.

g. **Evaluation of Groundwater Data.** An evaluation of the groundwater monitoring data analyzed according to the methods described in Part III, and whether the analysis indicates a release of waste constituents or waste degradation products from the Facility.

h. **Leachate Evaluation.** A summary of leachate data for the Brine Pond, including any laboratory results and measurements of the height of liquids in LCRS sumps. The Discharger shall also calculate the leakage rate and compare the value to the reporting threshold for each LCRS sump

i. **Sludge/Solids Evaluation.** A summary of sludge data for the Brine Pond.

j. **Waste Volumes.** A summary of all required information concerning waste volumes for the Brine Pond.

2. **Annual Summary Report** – The Discharger shall submit an annual report covering the period from January 1 through December 31 to the Regional Water Board. If desired, the Annual Monitoring Report may be combined with the Semi-Annual Monitoring Report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. The Annual Summary Report shall include, at a minimum, the following:

a. **Summary of Groundwater Monitoring Data.** A written summary of the groundwater monitoring results, indicating any changes made or observed since the previous Annual Summary Report. If a 5-year COC event was performed, then these parameters shall be presented in tabular format. All analytical data obtained during the previous year shall be presented in tabular form. Upon request of the Regional Water Board, the data shall be provided electronically in a file format and media acceptable to the Regional Water Board.

b. **Graphical Display.** A graphical display for all data collected for each monitoring point and background monitoring point. Each graph shall plot the concentration of one or more constituents over time for a given monitoring point. For any given constituent, the scale for all plots should be the same to facilitate comparison and identification of trends. On the basis of any outliers noted in the plotted data, the Regional Water Board may direct the Discharger

to carry out a preliminary investigation, in accordance with Part II.E, to determine whether a release is indicated. Trend analyses shall include identification of current trends, a comparison to previously identified trends, and a discussion of any significant changes in the trends.

c. **Background Concentration Limits Update.** Reevaluate background concentration limits (required every five years per Part III.A.2.c) and propose any appropriate changes.

d. **Leachate Data Summary.** A summary of leachate data for the Brine Pond , consisting of the monthly total volume of leachate collected during the reporting year from the LCRS and any other leachate collection systems to demonstrate the effectiveness of the LCRS. This summary shall contain a brief discussion of the leachate sampling results and volume produced and how the leachate was disposed of during the reporting period. This summary shall also include a table consisting of the last five years of leachate data collected at the Facility. The Discharger shall propose any updates to the RT for each LCRS sump during this time period based on the historical performance of each individual sump.

e. **Annual Waste Summary.** An annual summary consisting of the total volume of geothermal wastes generated at the waste management unit. The summary shall contain a table that lists each category of waste and the volume accepted at the waste management unit during the reporting period.

f. **Site Conditions Summary.** Include a comprehensive discussion regarding the condition of the Facility, including, but not limited to, interim cover areas, the current operational area, maintenance roads, the erosion and drainage control measures implemented to control run-on and run-off during the rainy season, the condition of monitoring wells, piezometers, and any other monitoring device located at the Facility. The discussion should also highlight any areas of noncompliance observed and repaired during the previous year and should be documented with photographs and inspection reports.

g. **Compliance Summary.** Include a comprehensive discussion of the compliance issues during the reporting period (the past year), and of any corrective actions taken or planned which may be needed to

bring the Discharger into full compliance with the Order or this MRP.

B. Report Schedule

Semi-annual monitoring reports shall be submitted to the Regional Water Board in accordance with the following schedule: Annual monitoring reports shall be submitted to the Regional Water Board by March 15 of the following year.

MRP Table 10—Semi-Annual Reporting Schedule

Monitoring Period	Report Due
January – June	August 15
July - December	March 15

C. Standard Reporting Procedures

1. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.

2. In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to clearly illustrate whether the Facility is operating in compliance with the WDRs. Where appropriate, the Discharger shall include supporting calculations (e.g., for monthly averages).

3. The results of any analysis taken more frequently than required at the locations specified in this MRP shall be reported to the Regional Water Board.

4. All monitoring reports shall be certified under penalty of perjury to be true and correct. Each report shall contain the following certification language:

> I certify under the penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system

designed to ensure that qualified personnel properly gathered and evaluated the information submitted. I have personally examined and am familiar with the information submitted in this document, 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 a fine and imprisonment.

5. The monitoring reports and any other information requested by the Regional Water Board shall be signed by a principal executive officer or ranking elected official. A duly authorized representative of the Discharger may sign the documents if:

   a. The authorization is made in writing by the person described above;

   b. The authorization specified an individual or person having responsibility for the overall operation of the regulated disposal system; and

   c. The written authorization is submitted to the Regional Water Board's Executive Officer.

6. Technical reports shall be prepared by or under the direction of appropriately qualified professional(s). Each technical report submitted shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal.

7. The Discharger shall comply with Electronic Submittal of Information (ESI) requirements by submitting all correspondence and reports required under this MRP and future revisions thereto, including groundwater monitoring data and discharge location data (latitude and longitude), correspondence, and monitoring reports to the State Water Board's GeoTracker database. Documents that are too large to be uploaded into GeoTracker should be broken down into smaller electronic files and labelled properly prior to uploading into GeoTracker.