CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

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Regional Board Website (https://www.waterboards.ca.gov/centralvalley)

[TENTATIVE] WASTE DISCHARGE REQUIREMENTS ORDER R5-2024-XXXX

ORDER INFORMATION

Order Type(s):	Waste Discharge Requirements (WDRs)
Status:	TENTATIVE
Program:	Title 27 Discharges to Land
Region 5 Office:	Sacramento (Rancho Cordova)
Discharger(s):	Aqua Clear Farms, Inc. Hatch Investments, a California Limited Partnership &
Facility:	Aqua Clear Farms, a California Corporation
Address:	6762 Flannery Road, Rio Vista, California 94571
County:	Solano County
Parcel Nos.:	0048-010-090 & 0048-010-100
GeoTracker ID:	L10001773161
Prior Order(s):	R5-2014-0105; R5-2002-0120; R5-1993-013; R5-1992-013; R5-1981-028; R5-1974-500; Resolution 70-57

CERTIFICATION

I, PATRICK PULUPA, 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, Central Valley Region, on _____ [Month] 2024.

_____

PATRICK PULUPA,
Executive Officer

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GLOSSARY

Antidegradation Policy	Statement of Policy with Respect to Maintaining High Quality Waters in California, State Water Board Resolution 68-16
Basin Plan	*Water Quality Control Plan for the Sacramento and San Joaquin River Basins*
BGS	Below Ground Surface
CalRecycle	California Department of Resources Recovery and Recycling
CAP	Corrective Action Program
CAMP	Corrective Action Monitoring Program
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
COCs	Constituents of Concern
CPMP	Closure and Post-Closure Maintenance Plan
CQA	Construction Quality Assurance
Designated Waste	(a) Hazardous Waste subject to variance from management requirements per Health and Safety Code section 25143; and (b) Nonhazardous Waste containing pollutants that, under ambient conditions, could be released in concentrations exceeding applicable WQOs, or that could reasonably be expected to affect beneficial uses of water. (Wat. Code, § 13173.)
DMP	Detection Monitoring Program
DTSC	California Department of Toxic Substances Control
EC	Electrical Conductivity
EIR	Environmental Impact Report
EMP	Evaluation Monitoring Plan
FEMA	Federal Emergency Management Agency

GLOSSARY

GCL	Geocomposite Liner
Hazardous Waste	Wastes which, pursuant to Title 22, section 66261.3 et seq., are required to be managed in accordance with Division 4.5 of Title 22. (Title 27, § 20164; Title 23, § 2521(a).)
HDPE	High-Density Polyethylene
JTD	Joint Technical Document
LCRS	Leachate Collection and Removal System
LEA	Local Enforcement Agency
Leachate	Liquid formed by the drainage of liquids from waste or by the percolation or flow of liquid through waste. Leachate includes any constituents extracted from the waste and dissolved or suspended in the fluid. (Title 27, § 20164.)
MCE	Maximum Credible Earthquake
MDB&M	Mount Diablo Base and Meridian
MDL	Method Detection Limit
mg/L	Milligrams per Liter
MPE	Maximum Probable Earthquake
msl	Mean Sea Level
MRP	Monitoring and Reporting Program
MSW	Municipal Solid Waste regulated under 40 C.F.R. part 258
MW	Monitoring Well
NTS	Not to Scale
PGA	Peak Ground Acceleration
RCRA	Resource Conservation and Recovery Act
ROWD	Report of Waste Discharge

GLOSSARY

SPRRs .....Standard Provisions and Reporting Requirements

Subtitle D .....USEPA-promulgated MSW regulations under RCRA (see 40 C.F.R. part 258)

TDS.....Total Dissolved Solids

Title 22.....California Code of Regulations, Title 22

Title 23.....California Code of Regulations, Title 23

Title 27.....California Code of Regulations, Title 27

USEPA.....United States Environmental Protection Agency

WDRs.....Waste Discharge Requirements

WMU .....Waste Management Unit

WQOs .....Water Quality Objectives

WQPS .....Water Quality Protection Standard

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

[TENTATIVE] WASTE DISCHARGE REQUIREMENTS ORDER R5-2024-XXXX
FOR
AQUA CLEAR FARMS, INC. & HATCH INVESTMENTS LIMITED PARTNERSHIP
AQUA CLEAR FARMS
SOLANO COUNTY

FINDINGS

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) hereby finds as follows:

Introduction

1. Aqua Clear Farms, a California corporation, owns and operates Aqua Clear Farms (Facility). Hatch Investments, a California Limited Partnership, owns the land where the Facility is located, approximately 15.5 miles south of Dixon in Solano County, Section 12, Township 4 South, Range 1 East, Mount Diablo Base and Meridian (MDB&M). The Facility's location is depicted on the Site Location Map in **Attachment A**

2. The Facility is on approximately 84-acres of a 160-acre property comprised of Assessor's Parcel Numbers (APNs) 0048-010-090 & 0048-010-100. The address associated with the Facility is 6762 Flannery Road, Rio Vista, California 94571.

3. As Facility owners and/or operators, Aqua Clear Farms and Hatch Investments (collectively, Dischargers) are responsible for compliance with this Order, which prescribes Waste Discharge Requirements (WDRs) regulating construction, monitoring, operation, closure, and post-closure maintenance of the Waste Management Units (WMUs) listed in **Table 1.**

Table 1—Summary of Waste Management Units (WMUs) Permitted Under Order

Unit	Liner Components	Class and Type	Size	Status	Note
Basin 1	Unlined	Unclassified	2 Acres	Closed	No wastes accepted; removed in 2012
Basins 2-5	Unlined	Class II Surface Impoundment	20 Acres (total)	Closed	Closed as Landfills in 2011

Unit	Liner Components	Class and Type	Size	Status	Note
Basin 6	12-inch Clay Liner	Unclassified	6 Acres	Closed	No wastes accepted. Filled in 2015 with native soils excavated from beneath Basin 7
Basin 7	Double liner and LCRS	Class II Surface Impoundment	4 Acres	Operating	Used for discharge and processing of drilling mud
Basin 8	Double liner and LCRS	Class II Surface Impoundment	4 Acres	Closed	Clean Closed in 2016.
Basin 9	Double liner and LCRS.	Class II Surface Impoundment	5 Acres	Operating	Used for discharge and processing of drilling mud
Basin 10	Double liner and LCRS.	Class II Surface Impoundment	4 Acres	Operating	Used for discharge and processing of drilling mud
Basin 9/10	Double liner and LCRS.	Managed as a Landfill	9 Acres	Planned	Phase 3 closure of Basins 9 & 10
Basin 11-13	Double liner and LCRS	Class II Surface Impoundment	16 acres (total)	Planned	Can be an active Class II surface impoundment if constructed to standards.
Former Truck Washout Area	Approved Final Cover	Unclassified	0.34 Acres	Closed	Clean Closed in 2015

See Glossary for definitions of terms and abbreviations in table.

Materials Accompanying Order

4. The following materials are attached to this Order, and incorporated herein:

ATTACHMENT A—SITE LOCATION MAP
ATTACHMENT B—FACILITY MAP
ATTACHMENT C—GAMA PROGRAM WELL SURVEY MAP
ATTACHMENT D—TYPICAL LINER SYSTEM & LCRS DETAIL
ATTACHMENT E—FORMER TRUCK WASHOUT AREA
ATTACHMENT F—CURRENT TRUCK WASHOUT AREA & BASIN 7
ATTACHMENT G—ENGINEERED ALTERNATIVE FINAL COVER PROFILE
ATTACHMENT H—FINAL WASTE ELEVATIONS
ATTACHMENT H—FINAL BASIN 9 AND 10 LINER OVERLAP

Standard Provisions & Reporting Requirements for Non-Hazardous Discharges of Waste Regulated under Subtitle D and/or Title 27, December 2015 Edition (SPRRs or Standard Provisions)

Information Sheet for [TENTATIVE] Waste Discharge Requirements Order (Information Sheet)

5. This Order is also accompanied by the concurrently adopted **Monitoring & Reporting Program (MRP) Order R5-2024-XXXX**, the provisions of which are incorporated as part of this Order. Each time the operative MRP is modified by the Central Valley Water Board or its Executive Officer, the revised version shall become the operative MRP (superseding the prior version) and be incorporated as part of this Order (i.e., in lieu of the prior version).

6. To the extent there are any material inconsistencies between the provisions of this Order, the operative MRP and the SPRRs, the provisions of this Order shall be controlling. However, to the extent a revised MRP contains new or different factual findings reflecting changed conditions or circumstances at the Facility, the revised MRP findings shall be controlling.

7. Additional information about the Facility is set forth in the **Information Sheet**, which is incorporated as part of these findings. (See Finding 4)

Drilling Mud

8. Drilling mud generally refers to fluids generated in the process of drilling a borehole into the earth, including for the extraction of oil and gas resources. Circulation of drilling mud cools and lubricates the drill bit, transports soil/rock (cuttings) to the surface and maintains hydrostatic pressure to prevent collapse of the borehole. Where a drill string passes through ancient sedimentary formations, natural occurring chemical constituents and salts may be transported

to the surface when the drilling mud returns to the surface through the borehole during drilling activities. Drilling mud may also include so-called “re-work” drilling mud wastes generated during drilling operations intended to secure, restore, or improve production in completed wells. Drilling mud does not include “production water,” “produced water,” or other liquids generated by the extraction of the extraction of oil and gas resources.

9. The Dischargers accept non-hazardous or inert drilling mud resulting from oil and gas extraction operations in both northern California and the Kern County oil field area. Drilling muds generated by northern California oil and gas extraction operations tend to have water-based characteristics. Drilling muds generated in Kern County oil and gas extraction operations tend to have hydrocarbon and/or synthetic based characteristics. Prior to drilling a natural gas well, the drilling mud tends to consist of bentonite clay mixed with water.

10. The Dischargers accept non-hazardous or inert directional drilling wastes from commercial and industrial drillers. Directional drilling wastes, also known as ‘horizontal drilling’ wastes, are produced from rotary drill methods where water is mixed with soil during the drilling process. Directional drilling is typically performed near the ground surface and typically considered non-hazardous or inert. Notwithstanding, directional drilling activities may occur in areas of known contamination. Where directional drilling is suspected to have occurred in an area of contamination, these WDRs require the Dischargers to characterize drilling mud loads for waste constituents prior to accepting the drilling mud load.

11. The Dischargers request authorization to accept non-hazardous or inert hydrovac wastes. Hydrovac wastes consist of removed water and soil from hydrovac operations, similar to directional drilling waste. Hydrovac machines disturb and remove soil using pressurized water. Hydrovac excavation techniques are used for “daylighting” underground piping, conduits, etc., for inspection, repair, or replacement. Hydrovac excavation uses high-pressure water and an air vacuum to cut through the soil and break it apart in a controlled manner. Once the soil is disturbed, the air vacuum evacuates the soil into a truck mounted debris holding tank. Hydrovac excavations may occur in areas of known contamination. Hydrovac wastes in a vacuum truck may contain other wastes or liquids, such as concrete truck rinse (washout) water, either alone or mixed with drilling wastes. Where hydrovac wastes are suspected to have originated in an area of contamination, these WDRs require the Dischargers to characterize drilling mud loads for waste constituents prior to accepting the drilling mud load.

12. These Waste Discharge Requirements collectively refer to the non-hazardous or inert wastes described in Findings 8, 9, 10, and 11 as “drilling mud.” Drilling muds tend to consist of varying ratios of water and soil which may have generic descriptions such as “mud,” “slurry,” “wet waste,” wet spoils,” “aqueous waste,” or

others. Drilling mud wastes are often described according to apparent physical characteristics such as “liquid,” “semi-solid,” or “solid” wastes. Testing conducted by the Dischargers in 1990 and 1999 showed that dried drilling mud has hydraulic conductivity in the 10E-7 to 10E-8 centimeters per second (cm/s) range.

13. Drilling muds and associated non-hazardous or inert wastes are typically transported to the Facility in tanker or vacuum trucks as apparent liquids or in apparent semisolid or solid states which also can contain free liquids. Notwithstanding, dried drilling muds and associated non-hazardous or inert wastes tend to have soil-like physical characteristics due to the materials used to create the drilling mud such as bentonite clay and due to the soil present in the other associated designated, non-hazardous, or inert wastes.

14. “Liquid waste” refers to any waste materials which are not spadable (Title 27, § 20164). For the purposes of these WDRs, separated drilling mud liquids (i.e., “top water”), liquids or free liquids from drilling mud, or other associated designated waste or inert waste a are considered a “liquid waste,” and the remaining associated drilling mud components are considered “spadable” solids. In the event a dispute arises on whether a substance is a “free liquid” within the meaning of these WDRs, resolution may be determined by performance of the “Paint Filter Liquids Test” (USEPA Method 9095B).

Facility

15. A “surface impoundment” is a WMU which is a natural topographic depression, excavation, or diked area, which is designed to contain liquid wastes or wastes containing free liquids, and which is not an injection well (Title 27, § 20164). California Code of Regulations, title 27 (Title 27) identifies the placement of designated liquids (including undewatered sludges) in surface impoundments as an authorized waste management strategy for discharges to land (Title 27, § 20120, Table 2.1).

16. The Facility consists of multiple operational, planned, and former surface impoundments (referred to herein as “basins”). The Facility’s operational basins are Class II surface impoundments designed to contain designated wastes. The Dischargers closed some non-operational basins as landfills and clean closed other non-operational basins, pursuant to Title 27. The locations of the Facility’s basins are shown in **Attachment B**, which is incorporated herein and made part of this Order by reference.

17. In 1970 the Facility property was owned by a Mr. Flannery, who worked with J&J Disposal to use the property from 1970 to 1973 for disposal of drilling mud directly to the ground surface pursuant to Central Valley Water Board Resolution 70-157, which provided WDRs, and Solano County Use Permit R-488. The

discharge activities were limited to approximately 25-acres of the northern portion of the site property bordering Flannery Road and State Highway 113. J&J Disposal did not perform groundwater monitoring. Available records relating to the volume or characteristics of the drilling mud and fluids discharged by J&J Disposal to the site, if any, have not been found. Available information indicates J&J Disposal ceased operations in 1973 or 1974.

18. Discharger Hatch Investments Limited Partnership purchased the site in October 1974. Records from the California Secretary of State's Office indicate Aqua Clear Farms, Inc. (C0714328) submitted an initial filing on 13 May 1974. Public records indicate Hatch Investments Limited Partnership and Aqua Clear Farms, Inc. are affiliated via shared management or ownership, use of common facilities, employees, equipment, and family interests.

19. In 1974, the Central Valley Water Board issued WDRs Order 74-500 to the Dischargers requiring drilling mud and rainfall to be retained onsite by dikes. WDRs Order 74-500 also required groundwater monitoring at the Facility. In 1976, the Dischargers installed monitoring well (MW-)1 downgradient of Basins 2-5. Groundwater sample results from MW-1 indicated elevated levels of inorganics.

20. The Central Valley Water Board in subsequent WDRs required the Dischargers to comply with the requirements of California Code of Regulations, title 23 (Title 23), chapter 15, and Title 27 (as of 1997) by closing and/or retrofitting and upgrading specific basins and a former truck washout area.

21. Drilling mud and other similar wastes arrive at the Facility with a general ratio of approximately 75 percent liquid and 25 percent solids. Annual drilling mud disposal rates at the Facility generally range from about 150,000 barrels (1 barrel = 42 gallons) to 225,000 barrels. Historical disposal rates have been as high as 630,000 barrels in 1985.

22. Current operations at the Facility consist of discharge of drilling mud from vacuum trucks or tankers directly into double-lined Class II surface impoundments. The drilling mud solids settle to the bottom of the impoundment, and the remaining water separates and rests on top of the settled mud ("top water"). During the dry season, the top water evaporates or the Dischargers transfer the top water to another lined Class II basin and mechanically process the underlying solids with low ground pressure compaction equipment to facilitate further drying.

23. The Dischargers compact drilling mud using steel-tracked and rubber-tired equipment. The Dischargers determine the moisture content of processed drilling mud by observing the performance of the compaction equipment. The

compaction process results in the construction of an embankment. Once the drilling mud reaches 50% moisture content or less, the Dischargers either move the dried drilling mud to another lined Class II basin to make room for incoming wet drilling mud or compact the dried drilling mud in place.

24. The Dischargers employ a drilling mud filling methodology which results in the gradual reduction of surface impoundment capacity to contain free liquids and seasonal precipitation. The Discharger proposes to fill surface impoundments with compacted drilling mud above adjacent perimeter levee elevations. The proposed methodology results in basins which operate and function as Class II non-municipal solid waste landfill WMUs. These WDRs establish a process and requirements for the Dischargers to demonstrate to the Central Valley Water Board that drilling mud solids filling and their compaction within the basins can occur above certain elevations in a manner that meets applicable standards for landfill WMUs while maintaining compliance with Title 27.

25. According to the Dischargers, a full truck typically received by the Facility contains 4,200 gallons of drilling mud, which is equivalent to 100 oil field barrels (bbl). Where one bbl is equivalent to 42 liquid gallons, the average annual drilling mud acceptance level from mid-2017 to mid-2021 is 1,440 loads (i.e.,144,040 barrels). The estimated annual amount of water from 1,440 loads of drilling mud is approximately 4.5 million gallons (MG).

26. The Facility includes the following onsite features, systems and structures:

    a. Six closed basins;

    b. Three active double lined basins;

    c. Three planned basins;

    d. One “clean closed” former truck washout area;

    e. Two Borrow Area Basins;

    f. Office trailer;

    g. One industrial water supply well; and

    h. A corrective action groundwater extraction well network.

Waste Classification & Permitting

27. The WMUs, including surface impoundments or “basins,” truck washout areas, and WMUs managed as landfills, are regulated under authority given in Water Code section 13000 et seq. and Title 27 section 20005 et seq.

28. Water Code section 13173 defines “Designated Waste” as either of the following:

    a. Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Health and Safety Code section 25143.

    b. Nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a WMU, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan.

29. Designated waste can be discharged only at Class I WMUs, or at Class II WMUs which comply with Title 27 and have been approved by the Central Valley Water Board for containment of the particular waste to be discharged.

30. Title 27 requires full containment of liquid designated wastes in Class II surface impoundment WMUs, double lined, with a leachate collection and removal system (LCRS), and which considers siting and geologic conditions (Title 27, § 20210).

31. On 8 August 2014, the Central Valley Water Board adopted WDRs Order R5-2014-0105, classifying the Facility’s WMUs as Class II units for the discharge of non-hazardous solid waste and designated waste (as defined per Wat. Code, § 13173). Subsequent to adoption, the Dischargers “clean closed” and/or retrofitted Basins to be consistent with Title 27 standards for Class II surface impoundments. This Order re-classifies the retrofitted WMUs, as described in **Table 1**.

32. On 4 August 2022, the Dischargers submitted a Report of Waste Discharge (ROWD) for the Facility. Information in the ROWD was used in the development of this Order. The Dischargers' ROWD makes the following significant proposals:

    a. The Dischargers propose to continue to discharge designated waste to lined Class II surface impoundments at the Facility. These classified wastes may be discharged only in accordance with Title 27.

    b. The wastes the Dischargers propose to continue discharging are drilling muds and other associated wastes.

33. The ROWD indicates the long-term plan developed for the Facility includes construction and use of Basins 11-13 as Class II Surface Impoundments for processing of drilling mud and drill cutting wastes at an undetermined time in the future. These WDRs recognize the planned Basins 11-13, but do not authorize construction.

34. The Dischargers' 4 August 2022 ROWD includes a Preliminary Closure and Post-Closure Maintenance Plan (CPMP) for Basins 2-5,9, and 10. Historically, the Dischargers submitted a Preliminary CPMP, dated 16 November 2000, for Basins 2-5 and Basins 7-10, a Final CPMP, dated 28 March 2003, for Basins 2-5, and a Post-Closure Maintenance Plan, in its 18 February 2014 ROWD, for Basins 9 and 10. These WDRs require the Dischargers to review, consolidate, update, and prepare a Final or Preliminary CPMP for all Facility WMUs listed in **Table 1** in a single document**.**

35. The Dischargers measure the electrical conductivity and pH of the incoming drilling mud at the Facility receiving area prior to directing incoming trucks to unload wastes into an active basin. In the ROWD, the Dischargers report the average electric conductivity of the drilling mud, between January 2019 to December 2021, was approximately 1,000 µmhos/cm. Historic incoming drilling mud has maximum electrical conductivity ranging from about 700 to 4,000 µmhos/cm as measured during load checking. The Dischargers' 2022 Semi Annual Reports indicate pH of incoming drilling mud ranges from 7.0 to 11.8.

36. A waste is a "hazardous waste" if it exhibits characteristics of corrosivity, excluding certain exceptions and variances. A waste exhibits the characteristic of corrosivity if it is aqueous or is non-aqueous and when mixed with an equivalent weight of water and produces a solution which has a pH less than or equal to 2.0 or greater than or equal to 12.5, as determined by a pH meter (Cal. Code of Regs., tit. 22, §§ 66261.20, 66261.22). These WDRs prohibit the Dischargers from accepting or discharging drilling muds with pH less than or equal to 2.5 or greater than or equal to 12.0.

37. The effects of evapoconcentration on liquids in the basins tend to concentrate constituents which results in increases to measured electrical conductivity in the basins. Following evapoconcentration of liquids, precipitates of dissolved solids may appear on the dried drilling mud contained within a basin. The Dischargers provide data in required semi-annual monitoring reports for liquid samples collected from the basins (also referred to as "top water"). Recent data for "top water" collected from Basins 7, 9, and 10 are shown in **Table 2, Table 3, and Table 4** below, respectively.

Table 2—Recent Constituent Concentrations, Basin 7

Date	pH (pH Units)	TDS (mg/L)	Electrical Conductivity (µmhos/cm)	Chloride (mg/L)	Sulfate (mg/L)	TPH, Diesel (mg/L)
May 2019	8.70	13,800	22,900	7,300	150	0.56
December 2019	8.72	55,000	90,900	36,000	280	0.56
June 2020	8.08	73,200	103,000	33,000	330	28
December 2020	7.96	130,000	216,000	87,000	600	.440
June 2021	7.42	176,000	277,000	130,000	890	1.0
November 2021	7.89	53,900	72,200	27,000	270	5.1
June 2022	7.19	174,000	181,000	120,000	890	0.720

See Glossary for definitions of terms and abbreviations in table.

Table 3—Recent Constituent Concentrations, Basin 9

Date	pH (pH Units)	TDS (mg/L)	Electrical Conductivity (µmhos/cm)	Chloride (mg/L)	Sulfate (mg/L)	TPH, Diesel (mg/L)
May 2019	8.45	38,100	51,700	20,000	150	0.200
December 2019	8.88	106,000	136,000	49,000	380	0.560
June 2020	8.27	273,000	243,000	150,000	670	1.200
December 2020	7.10	385,000	562,000	200,000	1,200	1.200
June 2021	Dry	Dry	Dry	Dry	Dry	Dry
November 2021	9.11	59,300	84,000	30,000	770	0.100
June 2022	7.46	141,000	159,000	92,000	1,900	0.330

See Glossary for definitions of terms and abbreviations in table.

Table 4—Recent Constituent Concentrations, Basin 10

Date	pH (pH Units)	TDS (mg/L)	Electrical Conductivity (µmhos/cm)	Chloride (mg/L)	Sulfate (mg/L)	TPH, Diesel (mg/L)
May 2019	9.07	34,000	48,200	19,000	1,000	0.084
December 2019	7.45	49,100	82,000	28,000	1,300	0.100
June 2020	6.64	248,000	225,000	130,000	2,500	0.160
December 2020	Dry	Dry	Dry	Dry	Dry	Dry
June 2021	Dry	Dry	Dry	Dry	Dry	Dry
November 2021	8.56	5,870	9,100	2,800	180	0.052*J*
June 2022	Dry	Dry	Dry	Dry	Dry	Dry

See Glossary for definitions of terms and abbreviations in table.

38. Applicable Water Quality Goals or standards for wastes discharged at the Facility include established California secondary maximum contaminant levels (secondary MCLs), agricultural water quality goals published by the Food and Agriculture Organization of the United Nations in 1985, USEPA Integrated Risk Information System (IRIS) Reference Doses, and groundwater quality from background MW-6A and background MW-14 at the Facility, as summarized in **Table 5** below. **Table 5** below also includes the lowest applicable water quality objective (WQO) for groundwater for protection of drinking water beneficial use for domestic and municipal supply wells.

Table 5—Water Quality Standards & Objectives

Water Quality Standard	TDS (mg/L)	Electrical Conductivity (µmhos/cm)	Chloride (mg/L)	Sulfate (mg/L)	TPH, Diesel (mg/L)
California Secondary MCL	500	900	250	250	-
Agricultural Goal	450	700	106	250	-

Water Quality Standard	TDS (mg/L)	Electrical Conductivity (µmhos/cm)	Chloride (mg/L)	Sulfate (mg/L)	TPH, Diesel (mg/L)
MW-6A (Background Well)	338-510	472-920	20-45	21-52.7	Non-Detect-0.066
MW-14 (Background Well)	534-820	1,242 – 1,389	180-260	37-45	Non-Detect - 0.04
USEPA IRIS Reference Dose	-	-	-	-	0.056
Lowest Potentially Applicable Water Quality Objective	450	700	106	250	0.056

See Glossary for definitions of terms and abbreviations in table.

39. Where wastes are not defined as “hazardous” as set forth in Finding 36, the proposed drilling muds and associated other wastes, including environmental media (soil and water) removed from an area suspected of containing contaminants, discharged to and contained in Facility basins meet the definition of a “designated waste” described in Finding 28.b.

40. The Dischargers propose to discharge drilling mud, associated other wastes, and related evapoconcentrate constituents as **Designated Wastes** (per Wat. Code, § 13171) to Class II WMUs at the Facility. This Order authorizes the discharge of such wastes to the WMUs specified in **Section B.1** and **Table 14**.

Basins

41. Basin 1: The Dischargers constructed Basin 1 in 1975 and 1976. The purpose of Basin 1 was for use as an “overflow” pond in case drilling mud or water overtopped the levee between Basins 2-5. The Dischargers removed Basin 1 in 2012. The available record indicates no wastes were discharged to Basin 1. Basin 1 is categorized as a closed “**Existing Unit”** under Title 27 (see Title 27, § 20164) and may not receive wastes.

42. Basins 2 – 5: The Dischargers constructed Basins 2 – 5 in 1975 and 1976 with earthen “levees” and native soil “liners” to contain the drilling mud and contact

rainfall onsite. The Dischargers used in-situ undisturbed native soil for the basin floors. In 2011, the Dischargers closed Basins 2, 3, 4, and 5 as landfills employing an engineered alternative design for the final cap as described in a Final CPMP. Basins 2, 3, 4, and 5 are categorized as closed "**Existing Units"** under Title 27 (see Title 27, § 20164), may not receive wastes, and are subject to postclosure maintenance requirements.

43. Basin 6: An area designated as Basin 6 in 1982, shares a common top of levee elevation with Basins 7-10 on the south side of Basin 6. Originally constructed with earthen "levees" and a 12-inch thick clay liner installed in the "floor," the Discharger intended Basin 6 to serve as an emergency overflow basin. The Dischargers represent that the levees forming Basins 7, 8, 9 and 10 have not failed, not been breached, and there has never been an overflow or waste discharge into Basin 6. Runoff from the interior of Basin 6 drains by sheet flow and shallow ditches to the approximate center of Basin 6 where it discharges into a ditch through a breech in the levee between Basin 6 and Basins 2-5 where runoff comingles with runoff from the Basin 2-5 area toward the northeast corner of the Facility.

44. The Dischargers constructed Basin 6 prior to the 1984 regulations requiring liner systems then contained in Chapter 15 of Title 23 (now in Title 27, as of 1997). In WDRs Order R5-2002-0120, the Central Valley Board authorized the Dischargers to use Basin 6 for leachate and top water discharges from other basins or for processing and/or disposal of drilling mud, provided the Dischargers retrofitted Basin 6 to meet certain criteria for Class II surface impoundments. The Dischargers subsequently placed native soils excavated from beneath Basin 7 in 2015 into Basin 6, raising the Basin 6 original "floor" elevation six to eight feet. The Dischargers represent that they did not retrofit Basin 6 for use for processing drilling mud, Basin 6 has never contained drilling mud, and there are no current plans to retrofit Basin 6 or use Basin 6 to discharge, process, or store drilling muds. Basin 6 is categorized as a closed "**Existing Unit"** under Title 27 (see Title 27, § 20164) and may not receive wastes.

45. Basin 7: Originally constructed in 1982/1983 with earthen "levees" and a 12-inch thick clay liner installed in the "floor" of the basin, the Dischargers use Basin 7 to discharge and process drilling mud. The Dischargers constructed Basin 7 prior to the 1984 regulations requiring liner systems then contained in Chapter 15 of Title 23 (now in Title 27, as of 1997). In 2015 the Discharger retrofitted the Basin 7 liner system to consist of a one foot low hydraulic conductivity layer, a 60-mil double-textured high density polyethylene (HDPE) geomembrane, a 200-mil HDPE geonet, a second 60-mil double-textured HDPE geomembrane, and a two foot soil operations layer. The Discharger incorporated a geotextile at the mid-point of the two foot thick operations layer to provide a warning to basin operations that the primary geomembrane liner is 12 inches below the geotextile.

The 200-mil HDPE geonet is the primary leachate collection component of the LCRS as depicted in **Attachment D**. Basin geometry directs leachate through the geonet toward the center of the Basin to a leachate collection swale. The Dischargers installed a suction lysimeter and gypsum block under the Basin 7 sump to monitor soil moisture and provide an indication of a possible release from Basin 7. The Dischargers constructed Basin 7 over previously impacted soils. Basin 7 is categorized as a "**New Unit"** under Title 27 (see Title 27, § 20164) and may continue to accept waste within their respective "existing footprints," depicted in **Attachment B**, provided: (a) waste receipts are sufficient to comply with financial assurances requirements (Title 27, § 21110); and (b) early closure is not required due to environmental impacts and/or other regulatory concerns. The Discharger commenced waste management operations in Basin 7 in February 2019.

46. Basin 8: Originally constructed in 1982/1983 with earthen "levees" and a 12-inch thick clay liner installed in the "floor" of the basin, the Dischargers operated Basin 8 as an active drilling mud processing basin until 1993. The Dischargers constructed Basin 8 prior to the 1984 regulations requiring liner systems then contained in Chapter 15 of Title 23 (now in Title 27, as of 1997). In 1993 the Dischargers retrofitted Basin 8 liner system to consist of a low hydraulic conductivity clay soil liner, and a pan lysimeter with PVC appurtenances and a leachate detection system. In 1994 the Dischargers recommenced the discharge of drilling mud wastes to the retrofitted Basin 8.

47. In 2013, the Dischargers ceased the discharge of drilling mud wastes to Basin 8 after detection of leachate / high-salinity liquid in the leachate detection system. The Dischargers dried the drilling mud wastes and relocated the dried wastes to Basin 10 in 2014 and 2015. On 26 February 2017, the Dischargers submitted a Basin 8 Clean Closure Report which documented completion of Basin 8 clean closure activities. Clean closure activity was an "excavation only" operation which included removal of drilling mud wastes, the clay liner, and two feet of adjacent natural geologic materials (i.e., native soils.). The Dischargers reported removal of approximately 30,000 cubic yards of drilling mud and 19,000 cubic yards of soil from Basin 8. The Dischargers no longer use Basin 8 to discharge and process drilling mud. The Dischargers expressed an intent to retrofit and use Basin 8 in the future. These WDRs recognize this future intent to use Basin 8 for the discharge of drilling muds and other associated wastes, but do not authorize retrofit or use of Basin 8 for the discharge of drilling muds and other associated wastes. The Discharger must submit a ROWD and request revision to these WDRs prior to construction of or discharge of drilling muds and other associated wastes into Basin 8. Basin 8 is categorized as a closed non-municipal solid waste "**New Unit**" under Title 27 which may not accept new wastes (see Title 27, § 20164).

48. Basin 9: Originally constructed in 1982/1983 with earthen "levees" and a 12-inch thick clay liner installed in the "floor" of the basin, the Dischargers use Basin 9 to discharge and process drilling mud. The Dischargers constructed Basin 9 prior to the 1984 regulations requiring liner systems then contained in Chapter 15 of Title 23 (now in Title 27, as of 1997). In 2012, the Dischargers retrofitted Basin 9 liner system to consist of a one foot low hydraulic conductivity layer, a 60-mil double-textured high density polyethylene (HDPE) geomembrane, a 200-mil HDPE geonet, a second 60-mil double-textured HDPE geomembrane, and a two foot soil operations layer. The Dischargers incorporated a geotextile at the mid-point of the two foot thick operations layer to provide a warning to basin operations that the primary geomembrane liner is 12 inches below the geotextile. The 200-mil HDPE geonet is the primary leachate collection component of the LCRS as depicted in **Attachment D**. Basin geometry directs leachate through the geonet toward the center of the Basin to a leachate collection swale. The Dischargers installed a suction lysimeter and gypsum block under the Basin 9 sump to monitor soil moisture and provide an indication of a possible release from Basin 9. The Dischargers constructed Basin 9 over previously impacted soils. Basin 9 is categorized as a "**New Unit"** under Title 27 (see Title 27, § 20164) and may continue to accept waste within its "existing footprint," depicted in **Attachment B**, provided: (a) waste receipts are sufficient to comply with financial assurances requirements (Title 27, § 21110); and (b) early closure is not required due to environmental impacts and/or other regulatory concerns. The elevation of the Bain 9 perimeter levee is 111.0 ft-msl. The maximum final elevation of Basin 9 is 140.0 ft-msl.

49. Basin 10: Originally constructed in 1982/1983 with earthen "levees" and a 12-inch clay liner installed in the "floor" of the basin, the Discharger uses Basin 10 to discharge and process of dried drilling mud. The Dischargers constructed Basin 10 prior to the 1984 regulations requiring liner systems then contained in Chapter 15 of Title 23 (now in Title 27, as of 1997). In 2010, the Discharger retrofitted Basin 10 liner system to consist of a one foot low hydraulic conductivity layer, a 60-mil double-textured high density polyethylene (HDPE) geomembrane, a 200-mil HDPE geonet, a second 60-mil double-textured HDPE geomembrane, and a two foot soil operations layer. The Discharger incorporated a geotextile at the mid-point of the two foot thick operations layer to provide a warning to basin operations that the primary geomembrane liner is 12 inches below the geotextile. The 200-mil HDPE geonet is the primary leachate collection component of the LCRS as depicted in **Attachment D**. Basin geometry directs leachate through the geonet toward the center of the Basin to a leachate collection swale. The Dischargers installed a suction lysimeter and gypsum block near the Basin 10 sump to monitor soil moisture and provide an indication of a possible release from Basin 10. The Dischargers constructed Basin 10 over previously impacted soils. Basin 10 is categorized as a "**New Unit"** under Title 27 (see Title 27, § 20164) and may continue to accept waste within their respective "existing

footprints," depicted in **Attachment B**, provided: (a) waste receipts are sufficient to comply with financial assurances requirements (Title 27, § 21110); and (b) early closure is not required due to environmental impacts and/or other regulatory concerns. The elevation of the Basin 10 perimeter levee is 109.0 ft-msl. The maximum final elevation of Basin 10 is 140.0 ft-msl.

50. Basin 9/10: Following closure of Basin 9 and Basin 10, the Dischargers propose to combine Basin 9 and Basin 10 into a contiguous WMU to receive drilling mud solids as depicted in **Attachment H**. Referred to as "Phase 3 closure" or "Basin 9/10" herein, Basin 9/10 represents the 'wedge' of airspace space between Basin 9 and Basin 10 filled with compacted drilling mud solids to elevations depicted in **Attachment H**.

51. The construction, operation, maintenance, and closure of Basin 9/10 are not permitted to adversely affect Basin 9 or Basin 10 containment features or structures, including, but not limited to final covers, LCRSs, drainage control facilities, or detection monitoring devices.

52. These WDRs establish a process and conditions for the Dischargers to demonstrate to the Central Valley Water Board that Basin 9/10 can be constructed, operated, maintained, and closed in compliance with Title 27 requirements for a Unit that meets applicable standards for landfill WMUs while maintaining compliance with Title 27 requirements without compromising the integrity of Basin 9 or Basin 10. Central Valley Water Board approval is required before the Dischargers may fill Basin 9/10 (Unit Construction Specification D.11).

53. Basins 7-10 share common levees between each respective basin. The "footprint" of each basin extends to the approximate midpoint of each common levee.

54. Basins 11, 12, and 13: The Dischargers' long-term development plan for the Facility, prepared in 1989, provided for future "Basins 11-14," renumbered as Basins 11-13, for the processing and disposal of drilling mud in the future. In 1991, Solano County certified a final Environmental Impact Report (EIR) evaluating the construction and operation of the Facility, including Basins 11-13. (State Clearinghouse No. 1989030168). Prior Central Valley Water Board WDRs Order R5-1993-013 and, its successor Order R5-2014-0105 (2014 WDRs), acknowledged the plan for, but did not authorize construction of or discharge into Basins 11-13. These WDRs likewise do not authorize construction of or discharge into these future Basins. The Discharger must submit a ROWD and request revision to these WDRs prior to construction of or discharge into Basins 11, 12, and 13.

Former Truck Washout Area

55. The Dischargers formerly maintained an unlined Truck Washout Area near the Facility entrance, depicted in **Attachment B** and **Attachment E**. The Dischargers operated the former unlined Truck Washout Area from 1978 to 2015. Records indicate disposal of drilling mud and fluids direct to the ground surface occurred in the former Truck Washout Area prior to the purchase and operation of the Facility by the Dischargers in 1974. In the 2014 WDRs, the Central Valley Board prohibited continued use of the former Truck Washout Area and required the Dischargers to submit a Work Plan for clean closure the Truck Washout Area.

56. On 12 September 2014, 29 April 2015, and October 2015, the Dischargers submitted the required Work Plan and subsequent revisions pursuant to Provision 11.C. of the 2014 WDRs. The Work Plan included procedures, specifications, drawings, reports, and tests for clean closure of the former Truck Washout Area and proposed relocation to an area adjacent to and contiguous with Basin 7, depicted in **Attachment B** and **Attachment F**.

57. The Dischargers submitted a January 2016 construction quality assurance report regarding clean closure of the former Truck Washout Area. The January 2016 construction quality assurance report provided documentation of clean closure of the former Truck Washout Area.

58. On September 15 and 16, 2015, the Dischargers excavated native soil from the former Truck Washout Area to an initial excavation depth of two feet and transported the excavated soils to Basin 10 in ten-wheel dump trucks. The Discharger removed a total of 890 cubic yards (cy) (111 loads) of native soil and deposited it into Basin 10. After a total of four soil samples were collected from the floor of the former Truck Washout Area, on 21 and 22 September 2015, the Dischargers excavated an additional two feet of native soils, for a total of four feet. The Dischargers removed and deposited a total of 1,852 cy (232 loads) of soil from the former Truck Washout Area and into Basin 10.

59. The final cover cap for the former Truck Washout Area is a multi-layer system consisting of soil and geosynthetic components. The lower component of the final cover cap is a low-hydraulic-conductivity soil layer defined in the specifications as engineered fill consisting of a 12-inch-thick soil layer, with hydraulic conductivity ranging from 1.1E-8 cm/sec to 3.6E-6 cm/sec with a geometric mean of the four samples was 4.74E-7 cm/sec. On 5 November 2015, the Dischargers installed a geocomposite over the engineered fill. On 7 November 2015 the Discharges installed a 12-inch-thick layer of soil for the Erosion Resistant Layer on the geocomposite. The Erosion Resistant Soil Layer consists of native soil that the Discharger transported from the Facility's borrow area to the former Truck Washout Area.

60. The Dischargers placed a geocomposite on the engineered fill and beneath the Erosion Resistant Soil Layer. The Dischargers prepared the finished surface of the former Truck Washout Area final cover in accordance with the approved work plan. The final grade is a minimum of 3% sloping from Basin 2 toward the main access road with surface drainage flowing to the south toward an existing ditch and culvert pipe. Widening of the main access road by 12 feet was the only deviation from the planned grading plan.

61. On 12 January 2018, the Dischargers submitted a Summary Report for Construction Quality Assurance and Materials Testing Service for Basin 7 Retrofit which also included observations relating to construction of the new Truck Washout Area adjacent to Basin 7. According to the Summary Report, the Dischargers incorporated an additional "sacrificial geomembrane" into the new truck washout and unloading area in addition to the Basin 7 liner system described in Finding No. 45.

62. The former Truck Washout Area is not subject to postclosure maintenance requirements.

LCRS Action Rates

63. This Order includes an Action Leakage Rate (ALR) for the Class II surface impoundment LCRS. The ALR is the maximum flow rate through the primary liner to the LCRS beyond which the Dischargers are required to take actions such as inspection and repair the primary liner system. As proposed by the Discharger in the ROWD, the ALR is based on the recommendations in the 1992 USEPA guidance document *Action Leakage Rate for Leak Detection Systems*. The guidance recommends that ALR for lined surface impoundments be set at no more than 1,000 gallons per acre per day. The Dischargers' leachate sumps hold approximately 4,000 gallons of leachate. At an ALR of 1,000 gallons per acre per day, the leachate sumps would be filled with leachate in one day. This Order requires actions to inspect and repair leaks in the primary liner or take other actions to mitigate the exceedance if the ALR for an impoundment is exceeded. This Order also requires new lined Class II surface impoundments to have an ALR calculated based on this procedure as part of their design. This Order specifies ALRs for Basin 7, Basin 9, and Basin 10.

Site Conditions

64. The Facility is surrounded by rolling hills, grasslands, and agricultural land. The Facility is at the base of the northern-most slopes of the Montezuma Hills, where the hills merge with the Putah Plain to the north. The Montezuma Hills are an uplifted block of Pleistocene alluvial sedimentary rocks just north of the confluence of the Sacramento and San Joaquin Rivers.

65. The undeveloped portion of the site property is natural grassland with topographic slopes ranging from less than 1% to approximately 10%. Site elevations range from 75 feet above mean sea level (ft-msl) to 130 ft-msl in a northeasterly to southwesterly direction.

66. Site-specific lithologic information is available from several geologic and hydrogeologic studies that have been performed at the site. Lithologic logs from borings indicate that the typical material at the site is silt and clay, including inorganic silt and very fine sand or a combination of silty or clayey fine sands. The exposed geologic units occurring in the vicinity have been mapped as early to late Pleistocene sedimentary deposits.

67. The deposits occurring at the Facility have been mapped as belonging to the early Pleistocene Montezuma Formation, which regionally consists predominantly of poorly sorted silt, sand, and some pebble gravel. These sediments are overlain by late Pleistocene “older alluvium” deposits of the Putah Creek Fan, consisting of poorly sorted sand, gravel, silt and clay. Groundwater occurs in thin saturated lenses of more permeable materials (typically silt and silty sand, with lesser amounts of fine gravel) in the predominantly fine-grained alluvial flood-plain sedimentary deposits (silt-clay mixtures). The alluvial deposits of clay, silt, and fine-grained sand typically pinch and swell over short distances laterally and vertically, creating discontinuous water-bearing zones bounded by aquitards of low permeability silt-clay mixtures. The aquitards create confining or semi-confining conditions in the underlying saturated zone.

68. In the Facility vicinity, the Southwest Putah Plain lies to the south and west of the Putah Creek Fan. Included in the southern portion of the Southwest Putah Plain are low rolling outcrops of the Tehama Formation. Elsewhere, the Tehama Formation is overlain by the younger and older alluvial deposits of Sweeney, Ulatis, and Alamo Creeks. These alluvial deposits consist largely of clay, with fewer and less permeable stringers of gravel than those of the Putah Creek Fan. Groundwater supplies are primarily restricted to the underlying Tehama Formation. The vertical and to a lesser extent the horizontal movement of water within and between geologic layers is inhibited by the discontinuous silt and clay bodies in each of the three layers.

69. The measured hydraulic conductivity of the shallow native soils underlying the WMUs ranges between 1.5E-04 cm/s in the most permeable of the perched and isolated water-bearing zones to hydraulic conductivities up to 4.6E-08 cm/s for the more clayey soils.

70. The ROWD states that the nearest Holocene-era fault are the Green Valley Fault approximately 20 miles from the Facility, the Napa fault 25 miles from the Facility, the Hayward fault 35 miles from the Facility, and that the San Andreas Fault

approximately 50 miles from the Facility. The ROWD identifies other faults approximately 6 miles from the Facility which have been mapped showing periods of activity prior to Holocene time (displacement classified as early to late Quaternary).

71. Land uses within one mile of the facility include agricultural, grazing, and open space.

72. Surface water from the Facility drains under State Highway 113 into an open field with eventual surface water flow to Lindsay Slough which flows into the Sacramento River within the Sacramento-San Joaquin Delta. According to the Central Valley Water Board's *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan), the beneficial uses of the Sacramento-San Joaquin Delta include: municipal and domestic use (MUN); agricultural supply (AGR); industrial process supply (PRO); water contact recreation (REC-1); non-water contact recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); wildlife habitat (WILD); migration of aquatic organisms (MIGR); and spawning, reproduction and/or early development (SPAWN).

73. Monitoring well and site investigation boring lithologic logs indicate that perched and confined groundwater exists at the site in the more permeable sand, silty sand, clayey silt or clayey sand layers that interfinger with the predominant plastic and non-plastic clays. These more permeable layers are generally about a foot or less in thickness, are generally of very limited extent, are not continuous across the site, and do not yield significant amounts of groundwater. Current groundwater extraction wells that are screened within the perched groundwater at the northeast corner of the at the site yield between 15 and 40 gallons per day (gpd). Therefore, the perched groundwater beneath the site does not meet the definition of an aquifer as defined in the Basin Plan.

74. Extensive field studies performed at the Facility over the last four decades have shown that the thin water-bearing lenses that transmit small amounts of groundwater are typically under confining pressure and are poorly interconnected laterally and vertically. Groundwater bearing zones are confined in thin, discontinuous, low permeability clay-silt-sand mixtures, bounded by thicker layers of silt-clay mixtures, typical of deltaic depositional environments.

75. Potentiometric groundwater underneath the Facility is first encountered between approximately 38 and 74 feet below ground surface (BGS). Potentiometric groundwater elevations vary by season and year, but typically range between 67 and 98 feet msl.

76. Saturated zones tend to be considerably deeper than measured potentiometric water surfaces. In many cases perched groundwater exists in more permeable confined layers which may be deeper than the groundwater elevations measured in Facility monitoring wells. Since the perched groundwater tends to rise up well casings from the more permeable layers to a potentiometric surface, potentiometric groundwater elevations do not necessarily correlate to saturated groundwater elevations.

77. According to the ROWD, thin water-bearing lenses at the site transmit small amounts of groundwater and are poorly interconnected laterally and vertically. Groundwater bearing zones are in thin, discontinuous, low permeability clay-silt-sand mixtures, bounded by thicker layers of silt-clay mixtures, typical of deltaic depositional environments. The Dischargers encountered two water-bearing zones at certain parts of the Facility, creating relative “shallow” and “deep” ground water zones. The water-bearing materials in the “shallow” zone are generally unconfined or semi-confined and encountered within 30-35 feet BGS. The depth of water-bearing materials in the “deep” zone are greater than 35 feet BGS. All “deep” well water-bearing zones are under confining head pressure. The water-bearing zones are difficult to identify in continuously cored borings, commonly appearing only as very moist to wet, are low yielding, and often require one to two days to fill the temporary well sufficiently for sampling. Based on borehole drilling performed at the Facility, the lateral extent of the “shallow” groundwater zone generally extends west of State Highway 113 to near the Facility entrance, and southward from Flannery Road to as far south as MW-6. The relatively “deep” water-bearing zone appears to be continuous across the site.

78. The first known aquifer underlying the Facility is the Putah Creek, as described in Finding Nos. 67 and 68. The ROWD indicates that based on historic records for current and former onsite water supply wells, specific water bearing zones beneath the Facility are unknown, but may range from 120 to 160 bgs.

79. The Dischargers contour apparent groundwater potentiometric surface at a one-foot interval to produce the contour maps presented in the biannual monitoring reports. The contour lines and inferred flow directions derived from the contour maps provide an indication of a theoretical groundwater gradient and flow rate of approximately 0.010 feet per foot in a general northeast direction for the fourth quarter 2021.

80. Monitoring data indicate background groundwater quality for first encountered groundwater (at background well MW-6A and MW-14) has electrical conductivity generally ranging between 472 to 1,389 µmhos/cm, with total dissolved solids (TDS) generally ranging between 338 and 820 milligrams per liter (mg/L).

81. According to the Basin Plan, the designated beneficial uses of groundwater at the Facility are municipal and beneficial use (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO). The Basin Plan also maintains that for planning and regulatory purposes, the term "groundwater" includes all subsurface waters that occur in fully saturated zones whether or not they meet the definition of an aquifer.

82. According to the ROWD, based on well completion reports in 2001 from the California Department of Water Resources, domestic well depths in the Solano subbasin range from 38 feet to 1,070 feet BGS with an average depth of 239 feet BGS. Municipal and irrigation wells range from 62 feet to 2,275 feet BGS with an average depth of 510 feet BGS. The City of Vacaville extracts groundwater from the Tehama Formation, which lies at a relatively shallow depth in the region where the city is located (near the English Hills).

83. The State Water Resources Control Board's (State Water Board) Ground Water Ambient Monitoring and Assessment (GAMA) Program indicates at least four supply wells within one mile of the Facility. There are three stock watering wells within one mile to the north of the site that are 100 to 200 feet deep. An industrial water supply well was drilled onsite in 1978 near the site entrance and is used for Facility truck washout, water for dust control, and water for soil moisture conditioning during liner and final cover construction. The locations of these wells are mapped in **Attachment C**.

84. Class III WMUs must be designed and constructed to withstand a maximum probable earthquake (MPE), whereas Class II WMUs must withstand a maximum credible earthquake (MCE). (Title 27, § 20370.)

85. A stability analysis is required for any portion of the WMU containment system installed after July 18, 1997 and for which the Central Valley Water Board has not approved a slope and foundation stability report in accordance with the requirements in Title 27 section 21750(f)(5). (Title 27, § 21750(f).)

86. The Discharger included specific seismic analysis information in a 2014 ROWD, submitted to the Central Valley Water Board 18 February 2014, which indicates that the nearest Holocene-era faults are the Green Valley Fault at a closest rupture distance of 20 miles, the Hayward Fault approximately 35 miles from the Facility, and the San Andreas Fault approximately 50 miles from the Facility. The 4 August 2022 Report indicates other faults showing periods of activity prior to Holocene time (displacement classified as early to late Quaternary) are within 6 miles of the Facility, displacement on the Vaca Fault occurred between approximately 11,700 to 700,000 years before present, and movement on the Kirby Hills, Midland, and Rio Vista Faults occurred between approximately 700,000 to 1.6 million years before present.

87. The MCE means the maximum earthquake that appears capable of occurring under the presently known geologic framework and MPE means the maximum earthquake that is likely to occur during a 100-year interval within a 62-mile radius of the Facility (Title 27, § 20164). Identification of the MCE and MPE is a deterministic methodology which considers a single event with magnitude and closest distance to known faults to determine level of shaking.

88. Appendix Q of the Dischargers' 4 August 2022 ROWD presented a 16 October 2015 Final Stability Analysis for the side slopes of an empty Basin 7 and included a site-specific seismic analysis. The 2015 stability report determined a "Maximum Considered Earthquake" (MCE_R) and related general design ground motion parameters based on information derived from observations and existing soil borings, published geologic literature and maps, and an interpretation of general procedures set forth by the American Society of Civil Engineers (ASCE) 7-10 standard, as summarized in **Table 6**.

Table 6—Seismic Ground Motion Parameters

Parameter	Value
Site Class	C, Very Dense Soil and Soft Rock
Latitude, Longitude	38.207° N, 121.814° W
Mapped spectral acceleration, 0.2 second period (Ss)	1.327g
Mapped spectral acceleration, 1.0 second period (S1)	0.465g
Soil amplification factor (F_a)	1.000
Soil amplification factor (F_v)	1.335
mapped peak ground acceleration (PGA)	0.472g
Modified spectral acceleration (S_{MS})	1.327g
Modified spectral acceleration (S_{M1})	0.621g
Design spectral acceleration (S_{DS})	0.884g
Design spectral acceleration (S_{D1})	0.414g
PGA modified coefficient (F_{PGA})	1.000

Parameter	Value
PGA_{Mean}	0.472g
Risk Coefficient (C_{RS})	1.047
Risk Coefficient (C_{R1})	1.087
Long-Period Transition Period (T_L)	8 seconds

See Glossary for definitions of terms and abbreviations in table.

89. The ASCE defines the Maximum Considered Earthquake (MCE_R) as the most severe earthquake effects considered by ASCE Standard ASCE/SEI 7-10. No direct formula exists to relate the methodologies used to determine MCE and MCE_R, respectively.

90. The results of the slope stability analysis for Basin 7, considering the MCE_R, show that the minimum calculated static factor of safety was 1.79, meeting the minimum FS requirement of 1.5, and meeting minimum yield acceleration requirements. The deformation analysis results indicate that, under MCE_R seismic conditions, deformation of the geosynthetic materials would be on the order of 1 inch with negligible deformation of the excavated slope.

91. The ROWD states that “Basins 9 and 10 have identical slope and waste containment system configurations as Basin 7 and acceptable [factor of safety] are assumed for these basins.” According to the ROWD, excessive frictional forces on basin side slopes are not expected to occur in Basins 7 and 9. In Basin 10, the Dischargers construct an embankment as they place and accumulate dried solids. The ROWD represents that slope stability for Basin 10 with an exterior slope between 2:1 and 3:1 horizontal to vertical ratio is “assured." For Basins 9 and 10 the closure plan included in the 4 August 2022 ROWD specifies an exterior above-grade slope ratio of 4:1 horizontal to vertical and indicates the Dischargers proposes to perform a stability analysis when residual waste elevations reach121.0 feet msl for Basin 9 and 119.0 feet msl for Basin 10 (**Attachment H**). These WDRs prohibit the Discharge to Basin 9 and Basin 10 above elevations of 121.0 feet msl and 119.0 feet msl, respectively without Central Valley Water Board approval.

92. This Order requires that the Dischargers include a slope stability analysis in Closure Plans submitted for the double-lined Class II surface impoundments for closure as landfills using, as a minimum standard, the peak ground acceleration from the MCE, as required by Title 27. The Dischargers may employ an alternative methodology to determine the MCE and MPE and identify seismic ground motion parameters under the known geologic framework provided a

certification statement and supporting analysis accompanies the stability analysis which affirms that such alternative methodology to determine the MCE and MPE satisfies the requirements of Title 27 section 20370 and may serve as the basis for static and dynamic slope stability analyses for the Facility. The slope stability analysis shall be certified by a registered civil engineer or a certified engineering geologist who performed the analysis.

93. The Dischargers shall maintain at least two surveying monuments, installed by a Professional Land Surveyor, from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period (Title 27, § 20950(d)).

94. Based on the Dischargers' interpretation of an isoheytal map for Solano County, as included in the ROWD, the Facility has an annual average precipitation of 18.75 inches. Data from the nearest weather stations (Rio Vista Station and Fairfield Station) are not directly correlated to the Facility. For Rio Vista, in a calendar year format, the data is available for the years of 1893 until 1977. For Fairfield, the data is available for the years from 1951 to 2019. Historical precipitation data for 1893 to 1977 data set for Rio Vista indicates that the wettest year on record, a total amount of 27.34 inches, 1940/1941. The historical precipitation data for the City of Fairfield data set indicates that the 2016/2017 wet weather season was the wettest year on record with a precipitation total of 42.61 inches of rain recorded in Fairfield.

95. The ROWD states that the mean pan evaporation rate is 56.70 inches per year multiple stations in the area after applying an evaporation coefficient of 0.75.

96. The Dischargers included a calculated evapotranspiration (ET) rate in the ROWD for water surfaces at the Facility. The study of ET accounts for atmospheric variables, such as relative humidity, solar radiation, temperature, and wind speed. The ROWD considers ET data collected from the California Irrigation Management and Information System (CIMIS) database of ET measurements for five stations near the Facility: Davis, Dixon, Twitchell Island, Winters, and Lodi West. The Dischargers reported the ET values range from a low of 50.30 inches at the Lodi West station to a high of 57.26 at the Twitchell Island station with an average ET of 53.28 inches. The ROWD states that the mean ET rate is 58.61 inches per year in the area after applying a factor coefficient of 1.10.

97. The Dischargers calculated a factored basin evaporation estimate for use in Facility water balance calculations which considers the pan evaporation rate and ET rate. The Discharger's factored basin evaporation estimate is an average of the mean pan evaporation rate (56.70 inches) and the mean ET rate (58.61 inches). The Dischargers identified in the ROWD the estimated total annual evaporation at the Facility is 57.66 inches.

98. WMUs must be constructed to accommodate storm water runoff from 24-hour precipitation events with a return period of 100 years for Class III WMUs, and a return period of 1,000 years for Class II WMUs. (See Title 27, § 20320.) According to National Oceanic and Atmospheric Administration's (NOAA) Precipitation Frequency Atlas 14, Volume 6 (rev. 2014), the Facility's 100-year and 1,000-year, 24-hour rainfall events are estimated to result in 4.43 and 7.84 inches of precipitation, respectively. Source: NOAA Precipitation Frequency Data Server (https://hdsc.nws.noaa.gov/hdsc/pfds).

99. The Dischargers monitor surface water runoff from the site at surface water monitoring point SW-1 just prior to a culvert that is located at the intersection of Flannery Road and Highway 113, as depicted in **Attachment B**. Usually dry during summer months, storm water discharge from the Facility is under State Highway 113 into an open field with eventual surface water flow to Lindsay Slough which flows into the Sacramento River within the Sacramento-San Joaquin Delta. The Facility is covered under the State Water Board's operative General Permit for Storm Water Discharges Associated with Industrial Activities, NPDES Permit No. CAS000001 (Industrial General Permit)(WDID 5S48I016275).

100. According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (https://msc.fema.gov/portal), all WMUs at the Facility are located outside an 100-year floodplain area with a 0.2% annual chance of flooding, known as "Zone X." However, WMUs are not expected to: (a) restrict the flow of a 100-year flood; (b) reduce the floodplain's temporary water storage capacity; or (c) result in a washout that poses a hazard to human health and/or the environment. (See 40 C.F.R. § 258.11(a); State Water Board Resolution No. 93-62, p. 6.).

Water Balance and Basin Freeboard

101. Title 27 section 20164 defines "freeboard" as the vertical distance between the lowest point along the top of a surface impoundment dike, berm, levee, or other similar feature and the surface of the liquid contained therein.

102. Title 27 section 20375(a) requires Class II surface impoundments to have capacity for seasonal precipitation, a 1,000-year 24-hour design storm event, and to maintain at least two feet of freeboard at all times. The 1,000-year, 24-hour storm event for the Facility is referred to hereafter as the "design storm". The Dischargers propose to maintain 6.0 feet of freeboard during the wet weather season from November 1 through April 30 when the design storm is most likely to occur. Maintenance of 6.0 feet of freeboard during the wet weather season provides adequate capacity to contain the design storm.

103. Title 27 section 20375(b) requires the Dischargers submit an operations plan to the Central Valley Water Board for Class II surface impoundments which provides operation levels and waste input quantities permitted each month based on anticipated precipitation and on past precipitation conditions for the year. The ROWD refers to the 2021 Impoundments Operation Plan (IOP) the Dischargers submitted to GeoTracker® on 1 October 2021 for the prior wet weather season.

104. The 2021 IOP states that Dischargers have partially filled Basin 10 with dried drilling mud. The Dischargers compact drilling mud compaction in 'lifts' and perform embankment construction with steel-tracked and rubber-tired equipment. The Dischargers did not consider the Basin 10 area available for evaporation in the water balance analysis.

105. The Dischargers' drilling mud treatment process relies on the evaporation of free liquid. The subsequent concentration of residual solids and salinity concentration affect both surface impoundment capacity and threatens groundwater quality. The amount of wet-weather precipitation, rate of evaporation, and the Dischargers' operational practices are factors which determine the surface impoundment capacity required to evaporate topwater from the drilling mud.

106. For Title 27-requried seasonal precipitation, the Dischargers' water balance emphasizes the 100-year wet season distributed monthly to prevent overflow of the impoundment. In the ROWD, the Dischargers calculated that, based on the monthly 100-year-frequency precipitation for the 2016-2017 water year, up to 2.73 feet of precipitation will accumulate in the basins in the month of March during a water year equivalent to the 100-year-frequency precipitation event.

107. The Dischargers indicate in the ROWD that topwater evaporation from the basins occurs from May through October and there is little "net" evaporation of topwater from the basins from November through April.

108. The Dischargers included a water balance in the ROWD which calculates the estimated amount of accumulation in Basin 7 and Basin 9 resulting from the 100-year-frequency and design storm precipitation events. The Dischargers' water balance considers historic precipitation and evaporation data, waste solids disposed to Basin 10, a drilling mud liquid to solids ratio of 75 percent to 25 percent, basin area available for annual evaporation, and quantity of drilling muds discharged to the basins.

109. Based on the water balance in the ROWD, the Dischargers report that the surface impoundments will have sufficient capacity to maintain more than two feet of freeboard and accommodate the required additional volume for the design storm event during the height of the 100-year wet season. This Order requires Class II surface impoundments to have capacity for the amount of precipitation

resulting from a 100-year frequency wet season and a 1,000-year 24-hour frequency storm event.

110. Title 27 requires that Class II surface impoundments be maintained with sufficient freeboard to accommodate seasonal precipitation and the design storm which shall not be less than two feet (Title 27, § 20375). The Dischargers' water balance indicates an additional 4.0 feet of freeboard is required during the wet weather season from November 1 through April 30. Minimum freeboard requirements for the Dischargers' surface impoundments, which provide capacity for the 1,000-year 24-hour frequency storm event, are summarized in **Table 7**.

Table 7—Minimum Basin Freeboard

Season	Basin 7	Basin 9	Basin 10	Future Basins
Nov.1 – Apr. 30:	6.0	6.0	6.0	6.0
May 1 – Oct. 31	2.5	2.5	2.5	2.5

All values in units of feet.

111. This Order implements wet season freeboard requirements described in **Table 7** by 1 November of each year. This amount of freeboard is necessary to accommodate cumulative rainwater from a 1,000-year wet season and maintain a minimum of 2.5 feet of freeboard during the entire wet season. The Discharger is required, by the MRP, to submit by 1 October of each year, an annual Impoundments Operation Plan that must identify the surface impoundments scheduled for accepting drilling mud/fluid and the available capacity for the upcoming 12-month period, as well as information about transfer of drilling mud and top water between surface impoundments such that the 2.5-foot freeboard requirement will not be violated.

112. Freeboard requirements described in **Table 7** apply to drilling muds discharged to surface impoundments unless and until each respective WMU is in a "Pre-Closure" operational status and the Dischargers demonstrate to the written satisfaction of the Central Valley Water Board that each respective WMU is managed in a manner that meets all applicable standards for Class II non-municipal solid waste landfill WMUs. The demonstration shall be supported by a stability analysis performed pursuant to Title 27 section 21750(f)(5) and in compliance with these WDRs.

Monitoring Networks

113. As of the date of this Order, the Facility's **groundwater** monitoring network consists of the existing and proposed monitoring wells listed in **Table 8**.

Table 8—Groundwater Monitoring Well Network

Well	Program	Monitored Unit	Water-Bearing Zone	Point of Compliance	Status
MW-5	Background	Site Background	Shallow	No	Decommissioned (1998)
MW-6	Background	Site Background	Shallow	No	Operational
MW-6A	Background	Site Background	Deep	No	Operational
MW-6B	Background	Site Background	Shallow	No	Decommissioned (1998)
MW-14	Background	Site Background	Deep	No	Operational
MW-2D	Detection, Corrective Action	Basins 2-5	Deep	Yes	Operational
MW-2R	Detection, Evaluation	Basins 2-5	Shallow	Yes	Operational
MW-3R	Groundwater Extraction, Corrective Action	NE Corner Remediation	Shallow	No	Operational
MW-4D	Detection, Evaluation	Basins 2-5	Deep	Yes	Operational
EMP-5	Detection, Corrective Action	Basins 2-5	Deep	Yes	Operational

Well	Program	Monitored Unit	Water-Bearing Zone	Point of Compliance	Status
EMP-6	Detection, Corrective Action	Basins 2-5	Shallow	Yes	Operational
MW-7	Detection	Basins 7-10	Shallow	Yes	Decommissioned (2000)
MW-7AR	Detection, Corrective Action	Basins 7-8	Deep	Yes	Operational
MW-8	Detection	Basins 7-10	Shallow	Yes	Decommissioned (2000)
MW-8R	Detection, Corrective Action	Basins 8-9	Shallow	Yes	Operational
MW-9	Detection	Basins 7-10	Shallow	Yes	Decommissioned (2000)
MW-10R	Groundwater Extraction, Corrective Action	NE Corner Remediation	Shallow	No	Operational
MW-11R	Detection, Corrective Action	Basins 7-10	Shallow	Yes	Operational
MW-12R	Detection, Corrective Action	Basins 7-10	Shallow	Yes	Operational
MW-13	Background	Basins 9-10	Deep	No	Operational as Piezometer-Only
HA-1R	Groundwater Extraction, Corrective Action	NE Corner Remediation	Shallow	No	Operational

Well	Program	Monitored Unit	Water-Bearing Zone	Point of Compliance	Status
HA-3R	Detection, Evaluation	Off-Site Evaluation	Shallow	No	Operational
HA-7	Detection, Evaluation	Off-Site Evaluation	Shallow	No	Operational

See Glossary for definitions of terms and abbreviations in table.

114. As of the date of this Order, the Facility's **unsaturated zone** monitoring network consists of the existing and proposed monitoring points listed in **Table 9**.

Table 9—Unsaturated Zone Monitoring Network

Monitoring Point	Device Type	Program	Monitored Unit	Status
LYS-7B	Suction Lysimeter / Gypsum Block	Detection	Basin 7	Operational
LYS-9B	Suction Lysimeter / Gypsum Block	Detection	Basin 9	Operational
LYS-10B	Suction Lysimeter / Gypsum Block	Detection	Basin 10	Operational

115. As of the date of this Order, the Facility's **surface water** monitoring network consists of the existing and proposed monitoring points listed in **Table 10**.

Table 10—Surface Water Monitoring Network

Monitoring Point	Location	Program	Monitored Unit	Status
SW-1	Upstream Side of Culvert at Highway 113 and Flannery Road	Detection	Entire Facility	Operational

See Glossary for definitions of terms and abbreviations in table.

116. As of the adoption of this Order, the above-described networks comply with the monitoring requirements of Title 27. (See Title 27, §§ 20415–20435.) Subsequent changes to these networks will be reflected in a Revised Monitoring & Reporting Program issued by the Central Valley Water Board.

Water Quality Protection Standard

117. A Water Quality Protection Standard (WQPS) is the analytical framework through which WMUs are individually monitored for releases and impacts to water quality. (Title 27, § 20390 (a).) Under Title 27, a WQPS is separately established for each WMU in WDRs. (*Id*.)

118. The Dischargers update calculations of Concentration Limits annually, using the most recent data collected from one background groundwater monitoring well (6A), and report the results in semiannual reports, such as the Dischargers' 31 July 2022 First Biannual 2022 Environmental Monitoring Report.

119. In August 2018 the Dischargers installed two additional background wells, identified as wells 13 and 14, to evaluate spatial variability of naturally-occurring inorganic constituents in groundwater upgradient of the active disposal basins at the Facility. For MW-13, the Dischargers reported observations of "[s]mall pieces of hardened cement grout … in the material removed from the well on the second day of development (September 4, 2018)" and concluded that "...the cement entered the well screen as a fluid (grout), then hardened in thin layers inside the well screen and was later removed as a solid during bailing." Due to the cement's apparent influence on inorganic monitoring parameter results, the Dischargers recommended MW-13 be used as a piezometer only and be excluded for use for background water quality monitoring purposes.

120. The ROWD includes a proposed revised WQPS applicable Facility-wide which considers historic data collected from decommissioned and current date from operational monitoring wells. The Dischargers contend that a Facility-wide

WQPS is necessary, in part, to "account for spatial variability in background ground water quality." In the ROWD, the Dischargers propose determining the Facility-wide WQPS by using 'pooled' groundwater data collected from MW-6, MW-14 (Deep), MW-6A (Deep), historic data from decommissioned background MW-5, and water quality data collected from decommissioned compliance MWs -7, -8, and -9 that was allegedly collected prior to use of the respective monitored units.

121. The Dischargers described the derivation of proposed concentration limits in Appendix 'S' to the ROWD, prepared by Pacific GeoScience and dated 29 July 2022. The calculated interwell tolerance limits from water quality data obtained from the proposed background monitoring wells described in Finding 113 performed at the 95 percent confidence level using ChemStat software. The Dischargers also performed the Sen's Slope method at the 95 and 90 percent confidence level for a two-tailed test where insufficient time is available for certain data sets for some parameters (boron, chloride, pH, Specific Conductance, and Total Dissolved Solids).

122. In the ROWD, the Dischargers provided information indicating that the specific historic water quality data collected from MWs -7, -8, and -9 and proposed for use in the 'pooled' groundwater data was obtained prior to placement of wastes in the respective Basins and, thereby, representative of background conditions. The ROWD states that water quality data collected from MWs -7, -8, and -9 between 16 December 1983 and 1 July 1985 "…represent local background conditions at the time monitoring was performed." The Dischargers represent in the ROWD, based upon research and review of available correspondences, that waste discharge to Basin 7 commenced in December 1983 and Basins 8-10 commenced in February 1984. The Dischargers included multiple correspondences in the ROWD, dated from 2 December 1982 through 14 February 1984, which appear to corroborate the relevant timeline of events.

123. On 8 July 2023, the Dischargers provided copies of *Site Expansion Study*, dated 15 November 1978, *Revised Groundwater Monitoring Program*, dated 24 May 1985, and *Ground Water Assessment Report*, dated 30 May 1985, which provided additional historic technical information regarding Monitoring Wells 5, 6, 7, 8, and 9. According to *Revised Groundwater Monitoring Program*, "sometime prior to 1983," the Dischargers converted Test Boring 5 (installed 8 September 1978) into MW-5 and Test Boring 3, installed 8 September 1978, into MW-6. *Revised Groundwater Monitoring Program* further states that MWs -7, -8, and -9 "were constructed in late 1983, prior to the use of [Basins] 6-10…[and] were sampled prior to receiving any wastes in the [Basins]."

124. The Dischargers ceased collecting samples from MW-6 on 4 October 1989. The ROWD indicates the Dischargers resumed sampling MW-6 in December 2020.

The record is unclear why the Dischargers ceased collecting samples from MW-6 after 4 October 1989, resumed collecting samples in December 2020 (or 15 September 2021), and did not collect samples from MW-6 during the intervening three decades. These WDRs require the Dischargers to evaluate, make recommendations for repairs, if any, to MW-6.

125. The Dischargers analyzed the water quality data collected from MWs -7, -8, and -9 between 16 December 1983 and 1 July 1985 and determined that the historic water quality data "…do not show trends of increasing, or erratic, concentrations and, therefore, were not impacted by facility operations." The Dischargers noted that they used the same MW -7, -8, and -9 dataset as presented in the Delineation Assessment Report prepared for the Facility in 1998. The Discharger also concluded in Appendix S to the ROWD that "[s]tatistical trend analyses of these water quality data show no concentration increases over time that definitively indicate water quality impact."

126. Sufficient information exists to use results of data collected from MWs -6A, -14, -5, -6, -7, -8, and -9 for the purpose of establishing background water quality conditions for the Facility.

127. In Appendix D of the ROWD, based on observations of data collected from in MWs -6A, -14, -5, -6, -7, -8, and -9, the Dischargers established that spatial variability of naturally-occurring inorganic constituents in groundwater exists upgradient of the active disposal basins. A WQPS applicable Facility-wide is appropriate for the Facility due to the spatial variability of naturally-occurring inorganic constituents in groundwater and the proximity of the respective WMUs at the Facility.

128. In the ROWD, Appendix S, the Dischargers proposed constituent concentration limits based on comparison of background and downgradient data described as "parametric," "nonparametric – maximum concentration," and "nonparametric – method detection limit." The Dischargers propose using interwell analyses to "pool" the background water quality data and evaluate compliance at downgradient wells also on an interwell basis against the "pooled" data. The non-normally distributed water quality data and the lack of historic data available for the installed compliance wells to support intrawell evaluation of compliance, preclude the use of parametric statistical analysis of groundwater quality data. As such, non-parametric analysis is the appropriate method for establishing constituent concentration limits for the Facility.

129. The Dischargers' proposed WQPS, included in an Appendix S to the ROWD and prepared by Pacific GeoScience, dated 29 July 2022, establish new concentration limits based on interwell evaluation of water quality data observed in MWs -6A, -14, -5, -6, -7, -8, and -9 and the respective observed

"nonparametric – maximum concentration," or "nonparametric – method detection limit" for various constituents. The new concentration limits tend to be greater than historic constituent concentrations observed in Detection Evaluation Wells HA-3R, and HA-7 and Corrective Action Well EMP-5.

130. The Dischargers may propose, in Annual Environmental Monitoring Reports, revised WQPS which apply the methods described in Appendix S to the ROWD and incorporate water quality data collected from background MW-6A (Deep) and background MW-14 (Deep).

131. In accordance with Title 27, this Order, by virtue of its incorporation of **MRP Order R5-20XX-XXXX** and subsequent revisions thereto, establishes a WQPS for each WMU at the Facility.

Corrective Action

132. In 1992 and 1993, the Central Valley Water Board issued WDRs Orders 92-013 and 93-013 requiring corrective action for groundwater impacts and for Basin 8 to be lined in accordance with Title 27 regulations. In 1998, the Central Valley Water Board issued Cease and Desist Order R5-1998-0114, requiring the Discharger to remove liquids, close, and/or clean out specific Basins. In 2002, the Central Valley Water Board adopted WDRs Order R5-2002-0120, requiring the Discharger to close Basins 2 through 5.

133. In 1993, the Dischargers lined Basin 8 and used the Basin for drilling mud discharge and processing until, in 2013, the replaceable clay liner showed breakthrough to the leachate detection system pan lysimeter in the liner. In August 2013, the Discharger closed Basin 8, as described in Finding 47.

134. The Dischargers removed drilling mud from Basins 7, 9, and 10 and retrofitted Basins 9 and 10 with double liners, as described in Findings 48, 49, and 50.

135. Between 2003 and 2011, the Dischargers closed Basins 2 through 5 and installed a final cover authorized by WDRs Order R5-2002-0120, as described in Finding 42.

136. In 1998, the Dischargers submitted an Evaluation Monitoring Program report. In 1999 the Dischargers submitted a workplan for a Corrective Action Program (CAP). The Regional Board approved the CAP in WDRs Order R5-2002-0120. The current groundwater extraction system consists of wells MW-3R, MW-10R, and MW-HA-1R, which are four-inch diameter wells instead of the previous two-inch diameter wells.

137. During 2013, in accordance with an approved work plan, the Dischargers replaced the extraction wells with larger four-inch diameter extraction wells and

installed upgraded pumps to improve flow rates. The current CAP consists of groundwater extraction from the four-inch diameter wells that include MW-3R, MW-10R, and MW-HA1R. Groundwater extraction rates with the replacement wells are higher than the original wells but are still low (0.01 to 0.03 gallons per minute per well) due to the limited nature of the zones in which the perched groundwater resides. The Dischargers direct the extracted groundwater to temporary storage in onsite troughs prior to transport and discharge to the active double-lined Class II surface impoundments.

138. The Dischargers redesigned the groundwater extraction system with the old wells decommissioned in February 2013 and new extraction wells installed in March 2013 identified as wells MW-3R, MW-10R and HA-1R, as listed in **Table 8**.

139. The Dischargers submitted *Engineering Feasibility Study for Corrective Action of Shallow Ground Water Zone, Aqua Clear Farms, Inc., Solano County, California,* dated October 31, 2016 and *Final Report of Findings, Evaluation Monitoring Program/Site Investigation, Aqua Clear Farms, Inc., Solano County, California*, dated July 29 2016 (2016 Engineering Feasibility Study), wherein the Dischargers recommended the following additions to the corrective action groundwater extraction system:

a. Installation of 2 shallow groundwater extraction wells to enhance the existing northeast corner extraction system.

b. Use of the “Old Flannery Well” (believed to be an abandoned former windmill-operated livestock well) to extract shallow groundwater in the northeast corner of the Facility.

c. Installation of two additional shallow groundwater extraction wells along the eastern property line near MW-4D;

d. And solar powered, rechargeable submersible pumps.

140. On 30 December 2022, the Dischargers submitted modifications to the corrective action measures described in the Dischargers’ 2016 Engineering Feasibility Study. The 2016 Study concluded that, based on “the generally stable water quality conditions observed in samples collected over the past five to six years … the installation of three of the five previously proposed ground water extraction wells” was not necessary. Accordingly, the Dischargers proposed installation of two additional shallow groundwater extraction wells along the eastern property line near MW-4D, as described in Finding 139.c, with installation of the additional three groundwater extraction wells “at some future date” if needed. The 30 December 2022 modification to the 2016 Engineering Feasibility Study proposes installation of all five groundwater extraction wells. These WDRs direct the

Dischargers to submit a work plan to install the expanded groundwater extraction system described in the 30 December 2022 modification.

141. The Evaluation Monitoring Plan (EMP) Report indicates groundwater impacts extend beyond the northern and eastern borders of the Facility and the lateral and vertical extent of the groundwater contamination has not been fully delineated. For example, observed total dissolved solids, conductivity, sodium, and chloride concentrations in EMP-6 exceed the respective concentration limits established by these WDRs. Further investigation, including additional borings on adjacent public and/or private property, is necessary to define the vertical and lateral extent of the groundwater impacts.

142. As of June 2023, the Dischargers report extraction of 147,529 gallons of groundwater from decommissioned extraction wells and 140,371 gallons of groundwater via the improved groundwater extraction system, yielding a combined total of 287,900 gallons of groundwater removed.

Design And Construction Standards

143. Liners for **new Class II WMUs, including surface impoundments** must be designed and constructed to contain fluids (e.g., drilling mud), to prevent the migration of waste to adjacent geologic materials, groundwater and surface water. (See Title 27, §§ 20310(a), 20330(a).)

144. General criteria for construction standards for Class II surface impoundments meet or exceed general criteria for construction standards for Class II non-municipal solid waste landfills (Title 27 § 20320, Table 4.1). Class II surface impoundments constructed and maintained in compliance with Title 27 are also expected to provide adequate containment of dried drilling mud wastes.

145. The Central Valley Water Board is authorized to approve an **engineered alternative** to Title 27 prescriptive standards (see, e.g., Title 27, § 20330 (c)), provided that the Dischargers demonstrate that compliance with the prescriptive standard would be unreasonably and unnecessarily burdensome in comparison to the proposed alternative. (Title 27, § 20080 (b)-(c); State Water Board Resolution 93-62).

146. The Dischargers have adequately demonstrated that construction of a liner in accordance with the Title 27 prescriptive standard would be unreasonably and unnecessarily burdensome in comparison to the proposed engineered alternative. The Dischargers have further demonstrated that the proposed engineered alternative(s), as described in **Attachment D**, are consistent with the performance goals of the prescriptive standard, as described above, and will afford at least equivalent water quality protections.

147. New WMUs shall incorporate a LCRS which complies with Title 27 prescriptive standards. (See Title 27, § 20340.)

148. The Dischargers may submit Construction Plans for Central Valley Water Board review and approval for the construction of new WMUs at the Facility, including Basin 9/10, Basin 11, Basin 12, and Basin 13, which incorporate an engineered alternative outlined in **Attachment D** and **Attachment I**, and which is incorporated herein.

149. The unsaturated zone monitoring system for future modules shall be implemented in accordance with the operative MRP.

150. According to the submitted seismic analysis, proposed new WMUs designed to the specifications described in the ROWD and referenced herein will be able to withstand seismic events described in Finding 87 and certified as described in Finding 92. (Title 27, § 20370.)

Unit Closures

151. Surface impoundments shall be closed in accordance with Title 27 sections 21400 and 20950(c)(2), which require removal of all free liquid and treatment of any residual liquid at the time of closure. Following removal and treatment of liquid wastes, surface impoundments shall be closed by clean closure, closure as a landfill, or closure as a land treatment unit. Unless the Dischargers demonstrate, and the Central Valley Water Board finds, that it is infeasible to attempt clean-closure of a surface impoundment, then all residual wastes, including sludges, precipitates, settled solids, and liner materials contaminated by wastes, must be completely removed from the impoundment and discharged to an approved Unit (Title 27, § 21400(b)(1)).

152. The Dischargers included in the ROWD an update to the Preliminary CPMP (2022 CPMP), which updates the previous CPMP prepared in 2014. The 2022 CPMP provides an anticipated WMU closure schedule and includes estimated maximum expected cost incurred at any time during the WMU projected life for a third party both close the WMU and to carry out the first thirty years of post-closure maintenance.

153. The Dischargers' 2022 CPMP proposes clean closure of some basins pursuant to Title 27 section 21400(b)(1). The Dischargers' 2022 CPMP also proposes closure of the double-lined Class II surface impoundments, Basin 9 and Basin 10, as landfills, with dried drilling mud compacted in place pursuant to Title 27 section 21400(b)(2)(A). The Dischargers propose to close Basin 9 and Basin 10 as landfills with a 4 horizontal: 1 vertical side slopes above the top of the

impoundment berms with the planning, design and construction supervised by a California Registered Civil Engineer.

154. For Basin 9 and Basin 10, the Dischargers propose a phased closure approach as a landfill with each phase representing approximately 10 years. Phase 1 represents closure of Basin 10, Phase 2 represents closure of Basin 9, and Phase 3 represents final completion and closure of Basin 9/10 as depicted in the waste plan in **Attachment H**.

155. For Basin 10, this Order requires the Dischargers to provide formal written notice to the Central Valley Water Board at least 180 days prior to placement of dried drilling mud that would reach an elevation of 119.0 feet-msl. This Order prohibits discharge to Basin 10 above elevation of 119.0 feet-msl unless the Dischargers provide a slope stability analysis, as described in Finding 91, subject to the Central Valley Water Board's written authorization.

156. For Basin 9, this Order requires the Dischargers to provide formal written notice to the Central Valley Water Board at least 180 days prior to placement of dried drilling mud elevations that would reach an elevation of 121.0 feet-msl. This Order prohibits discharge to Basin 9 above elevation of 121.0 feet-msl unless the Dischargers provide a slope stability analysis, as described in Finding 91, subject to the Central Valley Water Board's written authorization.

157. In constructing Basin 9 in 2012 and Basin 10 in 2010, the Dischargers installed overlapping basin liner systems in the vicinity of the levee access road between Basins 9 and Basins 10 to facilitate Phase 3 filling (i.e., Basin 9/10). According to the Dischargers' Basin 9, Class II Surface Impoundment, Construction Quality Assurance Report and related drawings, submitted February 2013 and July 2012, respectively, the system consists of the elements depicted in **Attachment I**. This Order prohibits the Dischargers' construction, filling, or closure of Basin 9/10 without the Central Valley Water Board's written authorization.

158. The Dischargers may seek the Central Valley Water Board's written authorization to commence construction, filling, or closure of Basin 9/10 provided (a) waste receipts are sufficient to comply with financial assurances requirements (Title 27, § 21110); (b) early closure is not required due to environmental impacts and/or other regulatory concerns, (c) the Dischargers demonstrate the proposed design for Basin 9/10 is consistent with the active Solano County Use Permit; and (d) the Dischargers complete closure of both Basin 9 and Basin 10 to the written satisfaction of the Central Valley Water Board.

159. In seeking the Central Valley Water Board's authorization for construction, filling, or closure of Basin 9/10, the Dischargers shall demonstrate the proposed activities meet Unit Construction Specifications of these WDRs and will not

adversely affect Basin 9 or Basin 10 containment features or structures, including, but not limited to, final covers, LCRSs, drainage control facilities, or detection monitoring devices.

160. To meet the LCRS requirements for Basin 9/10, the Dischargers may either install a new LCRS or demonstrate to the satisfaction of the Central Valley Water Board that the existing Basin 9 and Basin 10 LCRSs are both adequate to meet LCRS requirements for Basin 9/10.

161. Unit closure dates are generally described in **Table 11**.

Table 11—Unit Closure Schedule[1]

Unit Module	Closure	Closure Date	Notes
Basin 1	Removed	2012	No Wastes Received
Basins 2 -5	Closed as Landfill	19 April 2011	12th year of Post Closure Maintenance
Basin 6	Planned	None Specified	Closed
Basin 7	Operating	None Specified	Proposed Clean Closure
Basin 8	Clean Closure	26 February 2017	6th year of Post Closure Maintenance
Basin 9, (Phase 2)	Operating	None Specified	Proposed partial final closure as Landfill at 140.0 feet-msl
Basin 10, (Phase 1)	Operating	None Specified	Proposed partial final closure at 130.0 feet-msl
Basin 9/10, (Phase 3)	Planned	10 years or more following approval to commence use-	
Basin 11	Planned	10 years or more following approval to commence use-	-
Basin 12	Planned	10 years or more following approval to commence use-	-
Basin 13	Planned	10 years or more following approval to commence use-	-

[1] Closure dates are estimates, which may be affected by several factors (e.g., fluctuating waste receipts).

Unit Module	Closure	Closure Date	Notes
Former Truck Washout Area	Clean Closure	November 2015	8th year of Post Closure Maintenance

162. Prior to the commencement of partial or final closure activities for each respective surface impoundment, these WDRs require the Dischargers to submit a closure plan to the Central Valley Water Board which 1.) evaluate and make recommendations regarding the feasibility of clean closure of the surface impoundment; and 2.) ensure removal of all free liquid and treatment of any residual liquid from the surface impoundment at the time of closure.

163. The Central Valley Water Board may authorize the Dischargers to close surface impoundments with compacted in place dried drilling mud as a landfill pursuant to Title 27 section 21400(b)(2)(A) or direct the Dischargers to clean close basins in the event specific facts do not support closure of a surface impoundment filled with compacted in place dried drilling mud as a landfill, pursuant to Title 27 section 21400(b)(2)(A).

164. Upon Central Valley Water Board approval for closure of a Class II surface impoundment as landfill pursuant to Title 27 section 21400(b)(2)(A), the WMU classification shall remain unchanged from the classification of WMUs listed in **Table 1**.

165. Surface impoundments closed as landfills shall be closed pursuant to landfill closure requirements in Title 27 section 21090 and the surface impoundments must meet the applicable siting and construction standards in Title 27 sections 20240 through 20310. Closure as a landfill further requires that the moisture content of residual wastes, including sludges, does not exceed the moisture holding capacity of the waste either before or after closure. This Order includes requirements to address the applicable standards for closure of the Dischargers' surface impoundments.

166. For surface impoundments closed as landfills, the goal of closure, including but not limited to the installation of a final cover, is to minimize the infiltration of water into the waste, thereby minimizing the production of leachate and gas. For such WMUs, after closure, the final cover constitutes the WMU's principal waste containment feature. The goal of post-closure maintenance at such WMUs is to assure that the WMU continues to comply with this performance standard until such time as the waste in the WMU no longer constitutes a potential threat to water quality (Title 27, § 20950(a)).

167. For surface impoundments closed as landfills closed after 18 July 1997, the preliminary and final CPMPs must incorporate a cover-integrity monitoring and maintenance program which includes at least the components described in

described in Title 27 section 21090(a)(4). The annualized post-closure maintenance plan cost analysis (see Title 27 § 21769(c)) shall include an itemized estimate of the annual cost of each component.

168. In the 2022 CPMP, the Dischargers propose closure of Basin 9 and Basin 10 with an engineered alternative final cover, as specified in **Attachment G,** and connected by an access road as depicted in the Final Waste Elevations drawing **(Attachment H)**. The proposed final cover would consist of at least 24" of compacted drilling muds as the foundation layer; 12" soil compacted to hydraulic conductivity of 10E-06 or less as the low hydraulic conductivity layer; a 200-mil geonet for drainage; and 12" of vegetative cover.

169. The 2022 CPMP does not include a proposed final cover or grading plan for Basin 7.

170. For surface impoundments closed as landfills, all vegetation for the closed Unit's vegetative cover layer shall meet the erosion resistant layer requirements of Title 27 section21090(a)(3)(A)(1) or, where a Unit does not utilize the mechanical erosion resistant layer, Title 27 section 21090(a)(3)(A)(2) (Title 27, § 20950(e)).

171. The Dischargers propose, and this Order requires, that the Class II surface impoundments closed as landfills have external side slopes with maximum steepness of 4 horizontal: 1 vertical and that the top deck have a minimum 3% slope for drainage as depicted in **Attachment H**. The ROWD states that Dischargers have performed testing of the mechanical properties of dried drilling mud (including triaxial shear testing) that indicate a factor of safety of greater than 1.5 can be achieved at an even steeper slope of 3 horizontal: 1 vertical.

172. The Dischargers have demonstrated that the proposed engineered alternative, which includes an additional geocomposite as depicted in **Attachment G** is consistent with the performance goals of the prescriptive standard, as described above, and will afford at least equivalent water quality protections.

173. The proposed final cover slopes are within Title 27 limits (i.e., 1¾ horizontal feet for every 1 foot of vertical gain) and supported by a static and dynamic slope stability analysis demonstrating that side slopes will remain stable, both under stable and dynamic conditions, throughout the life of the unit. (See Title 27, § 21750(f)(5).)

174. The Dischargers' proposed final covers, together with modifications set forth in **Attachment G**, are hereby approved for closure of the WMUs identified in **Finding 161**.

Financial Assurances

175. Title 27 requires dischargers applying for regulatory coverage to provide cost estimates, supported by sufficient detail to validate the plausibility of the estimate, for closure, post closure maintenance (Title 27, §§ 21750(i), 21400(b)(1), 21400(b)(2)(A), 21769(b), 21770), and corrective action costs due to known or reasonably foreseeable release (Title 27, §§ 22100(a)-(b), 22101(a), 20380(b)).

176. For any proposed Unit and for any Unit not yet required to undergo final closure, the ROWD shall contain a preliminary CPMP, pursuant to Title 27 section 21769, containing a generalized cost estimate for closure costs and for annualized post-closure costs, supported by sufficient detail to validate the plausibility of the estimate (Title 27, § 21750(i)).

177. For closure, the cost estimates shall consider costs for a third party to both close the surface impoundment and carry out the first thirty years of post-closure maintenance (Title 27, § 21769(b)(1)). The cost estimate shall "[p]rovide a third party with specific tasks and cost estimates for the closure and postclosure of a solid waste landfill in the event that a third party must assume the responsibility for closure and/or postclosure maintenance" (Title 27, § 21770(d)(3)). The cost estimate shall consider the greater of mandatory clean-closure of class II surface impoundments (Title 27 §§ 20380, 21400(b)(1),) unless and until the Central Valley Water Board authorizes a fallback closure option pursuant to Title 27 section21400(b)(2)(A).

178. The minimum annual deposit into the respective funds shall be in accordance with Title 27 section 22225(a)(2)(B), such that each closure phase is fully funded by the time the last shipment of dried drilling mud has been discharged to the area to receive partial final closure, plus inflation adjustments for surface impoundment closure, post closure maintenance, and corrective action costs.

179. The Dischargers' 2022 CPMP includes a cost estimate of $1,968,921 (2022 dollars) for closure and post-closure maintenance of Basins 9 and Basin 10, of which $1,025,280 (2022 dollars) is allotted for closure of Basin 9 and Basin 10, and $731,400 (2022 dollars) is allotted for 30 years of post-closure maintenance. On 23 October 2023, the Discharger provided a revised itemized cost estimate for the clean closure of Basins 9 and Basin 10, which revised the cost estimate to $859,050 (2023 dollars), as summarized in **Table 12**.

180. The Dischargers' 2022 CPMP excludes estimated costs for closure of Basin 7. On 23 October 2023, the Discharger provided an itemized cost estimate for the clean closure of Basin 7, totaling $727,260 (2023 dollars), as summarized in **Table 12**.

181. The Dischargers' 2022 CPMP includes a cost estimate of $212,241 (2022 Dollars) for the total reasonably foreseeable groundwater corrective action, capital costs, and the first 30-years of postclosure maintenance. The cost estimate provides for five (5) new proposed groundwater extraction wells described in the 2016 Engineering Feasibility Study but excludes costs for existing corrective action measures pertaining to three (3) active groundwater extraction wells. The Dischargers advised that the corrective action cost estimate requires revision to reflect modifications to the 2016 Engineering Feasibility Study (See Finding 140). The revised cost estimate for installation and development of two (2) new extraction wells is $33,380 and annual monitoring is $3,400, in 2023 dollars. The revised groundwater corrective action cost estimate for the first 30 years of post-closure operation for two (2) new corrective action wells is $135,380 ($33,380 + $102,000 = $135,380), in 2023 dollars as, as summarized in **Table 12**.

182. Title 27 section 22236 requires adjustments to the cost estimates for closure and/or postclosure maintenance and/or corrective action based on an inflation factor for the previous calendar year. On 4 April 2023, CalRecycle determined that, based on information obtained from the U.S. Department of Commerce, Bureau of Economic Analysis, Table 4, dated March 30, 2023, the inflation factor for 2022 is 1.070 (7.0%). These WDRs apply this inflation factor (1.070) to the Discharger's 2022 CPMP cost estimates to determine amounts in 2023 dollars.

183. The total cost estimate for closure ($1,586,310), post-closure maintenance ($782,598), and corrective action ($299,002) for the Facility is $2,713,650 (2023 Dollars), as summarized in **Table 12**.

Table 12—Cost Estimates (Financial Assurances)

Item	2022 Amount	Inflation Factor	2023 Amount	Note
Basin 9 and Basin 10 Clean Closure	$1,025,280	---	$859,050	October 2023 Update
Basin 7 Clean Closure	---	---	$727,260	October 2023 Update
Closure, Total	$1,525,280	---	**$1,586,310**	
Post-Closure Maintenance, Total	$731,400	1.070	**$782,598**	all basins
Proposed Corrective Action	--	--	$135,380	2 new proposed groundwater extraction wells
Existing Corrective Action	$67,200	1.070	$71,904	3 existing groundwater extraction wells

Item	2022 Amount	Inflation Factor	2023 Amount	Note
Corrective Action, Total	$279,441	1.070	**$207,284**	

184. The cost estimates provided in the Dischargers' 2022 CPMP do not satisfy Title 27 requirements for closure, post closure maintenance, or corrective action costs estimates. The 23 October 2023 updated cost estimates appear reasonable (see Findings 179-180). This Order requires the Dischargers to incorporate revised cost estimates for closure, post closure maintenance, and corrective action costs into the Dischargers' CPMP.

185. For closure funding, pursuant to Title 27 section 22207(a), the Central Valley Water Board requires operators of Class II surface impoundments to "establish an irrevocable closure fund (or to provide other means) pursuant to [Chapter 6 of Title 27, i.e., §§ 22240-22254] … to ensure closure … in accordance with an approved plan meeting all applicable SWRCB-promulgated requirements of [Title 27]." Allowable financial assurance mechanisms are included in section 22228. Formulas for calculating minimum fund balances are included in Subchapter 3, Article 1, sections 22225 and 22226.

186. For post-closure maintenance, pursuant to Title 27 section 22212(a), the Central Valley Water Board requires operators of Class II surface impoundments to "establish an irrevocable closure fund (or to provide other means) pursuant to [Chapter 6 of Title 27, i.e., §§ 22240-22254] … to ensure post-closure maintenance… in accordance with an approved plan meeting all applicable SWRCB-promulgated requirements of [Title 27]." Allowable financial assurance mechanisms are included in section 22228. Formulas for calculating minimum fund balances are included in Subchapter 3, Article 1, sections 22225 and 22226.

187. For corrective action, pursuant to Title 27 section 22222, the Central Valley Water Board also requires operators of Class II surface impoundments to "establish an irrevocable fund (or to provide other means) pursuant to [Chapter 6 of Title 27, i.e., §§ 22240-22254] … to ensure funds are available to address a known or reasonably foreseeable release[s]…." Allowable financial assurance mechanisms are included in section 22228. Formulas for calculating minimum fund balances are included in Subchapter 3, Article 1, sections 22225 and 22226.

188. The Dischargers submit an annual Financial Assurances Report to the Central Valley Water Board, which provides updated trust fund balances, documents deposits to the trust fund, and provides additional documentation related to trust agreements for the closure/post-closure maintenance and for the corrective action financial assurance mechanisms for Facility WMUs in accordance with Title 27 financial assurance requirements and requirements established by

WDRs Order R5-2014-0105. This Order requires the Discharger to continue to submit an annual Financial Assurances Report to the Central Valley Water Board.

189. According to the ROWD, including the Dischargers' 2022 CPMP, and the May 2022 Financial Assurances Report, the Dischargers provided information indicating they maintain separate irrevocable trust funds for closure/post-closure maintenance and for groundwater corrective action, respectively, as financial assurance mechanisms to satisfy Title 27 section 22228.

190. Irrevocable trust accounts are deposit accounts held by an irrevocable trust established by a statute or a written trust agreement (12 C.F.R. § 330.13). A grantor of an irrevocable trust (i.e., the Dischargers) creates the trust and contributes funds or property to the trust, typically consisting of cash or securities, and names a trustee(s), who is responsible for all aspects of the administration of a trust. Once the trust has been created and funded, the grantor cannot change the terms and provisions of the trust without permission from the beneficiary(s) (i.e., the Central Valley Water Board).

191. As of 19 May 2022, and as described in the ROWD, including the Dischargers' 2022 CPMP, and the May 2022 Financial Assurances Report, the available closure and post-closure maintenance irrevocable trust fund and corrective action irrevocable trust fund balances are summarized in **Table 13.**

Table 13—May 2022 Fund Balances (Financial Assurances)

Irrevocable Trust	Trustee	Trust Goal Amount	Current Balance
Closure and Post-Closure Maintenance	Bank of the West	$185,928.25	$ 116,993.99
Corrective Action	Bank of the West	$73,756.81	$73,756.81
Total			$190,750.80

192. The irrevocable trust agreement documents included in the 2022 Annual Financial Assurance Report and similar previous annual financial assurance reports for 2015, 2016, 2017, 2018, 2019, 2020 do not include key information for the Trustee, including name, title, or signature of the Trustee's authorized representative. The Dischargers further represented that their irrevocable trust funding mechanisms include money market account products, which allow for "unlimited withdrawals, transfers, and deposits at any Bank of the West branch or ATM" and premium certificates of deposits with 12-month terms. The Dischargers have not established that the securities are held by, or deposited into, the respective irrevocable trust accounts.

193. In a 1 November 2022 letter sent via certified mail, Central Valley Water Board staff requested the Dischargers to submit duly executed copies of the irrevocable trust agreements by 15 November 2022. In a 9 December 2022 electronic mail correspondence, the Dischargers provided responsive documents, which the Dischargers represented included the trust agreement for closure and post-closure and the trust agreement for corrective action. Central Valley Water Board staff reviewed the information submitted by the Dischargers and made the following observations:

    a. The closure and post-closure "Schedule A" amount as represented in the 2022 Annual Financial Assurance Report ($185,928.55) is inconsistent with the closure and post-closure "Schedule A" amount ($116, 993.99), as represented in the 9 December 2022 response;

    b. The Dischargers submitted two "Schedule B" forms, each dated 25 November 2002, which each reference a "Trust Agreement (Only)," but do not include other contemporaneous portions of the documents related to the respective "Schedule B" for closure and post-closure or corrective action;

    c. The Dischargers did not identify the assets, including security instruments, held by the respective trusts;

    d. The Discharger did not provide an attestation, certification, or statement of authenticity made by a financial institution, its agents, employees, or representatives regarding the documents on financial institution letterhead by a representative, employee, or agent duly authorized to make attestations, certifications, or statements of authenticity on behalf of the financial institution; and

    e. The Dischargers did not certify or submit the documents under penalty of perjury.

194. The Dischargers provided documentation of a Pledged Certificate of Deposit account with California Bank and Trust for closure and post-closure maintenance established on 26 October 2023 **with an initial balance of $123,764.00** (Closure / Post-Closure Pledged Account). The Closure / Post-Closure Pledged Account is supported by a written agreement which identifies Aqua Clear Farms, Inc. as the "Grantor," California Bank and Trust as the "Trustee," and names the Central Valley Water Board as the "Beneficiary." The Written agreement specifies that payments made to the Closure / Post-Closure Pledged Account shall consist of cash or securities at least 30 days prior to the anniversary date of establishment of the Pledged Account. The Trustee will furnish a statement confirming the value of the Closure / Post-Closure Pledged Account to the Dischargers who are

responsible for providing the statement confirming the value of the Closure / Post-Closure Pledged Account to the Central Valley Water Board. These WDRs require the Dischargers to provide the statement confirming the value of the Closure / Post-Closure Pledged Account to the Central Valley Water Board. The written agreement further specifies that all orders, requests, and instructions by the Grantor to the Trustee shall be in writing and signed by designated persons. These WDRs require the Dischargers to provide the Central Valley Water Board copies of all orders, requests, and instructions made by Aqua Clear Farms to the Trustee regarding the Closure / Post-Closure Pledged Account.

195. The Discharges provided documentation of a Pledged Certificate of Deposit account with California Bank and Trust for Groundwater Corrective Action established on 26 October 2023 **with an initial balance of $78,921.00** (Corrective Action Pledged Account). The Corrective Action Pledged Account is supported by a written agreement which identifies Aqua Clear Farms, Inc. as the "Grantor," California Bank and Trust as the "Trustee," and names the Central Valley Water Board as the "Beneficiary." The Written agreement specifies that payments made to the Corrective Action Pledged Account shall consist of cash or securities at least 30 days prior to the anniversary date of establishment of the Pledged Account. The Trustee will furnish a statement confirming the value of the Corrective Action Pledged Account to the Dischargers who are responsible for providing the statement confirming the value of the Corrective Action Pledged Account to the Central Valley Water Board. These WDRs require the Dischargers to provide the statement confirming the value of the Corrective Action Pledged Account to the Central Valley Water Board. The written agreement further specifies that all orders, requests, and instructions by the Grantor to the Trustee shall be in writing and signed by designated persons. These WDRs require the Dischargers to provide the Central Valley Water Board copies of all orders, requests, and instructions made by Aqua Clear Farms to the Trustee regarding the Corrective Action Pledged Account.

196. The Closure / Post-Closure Pledged Account and Corrective Action Pledged Account described in Findings 194 and 195 qualify as a "State Approved Mechanism" for financial assurance pursuant to Title 27 section 22254.

197. The respective Pledged Account balances described in Findings 194 and 195 are insufficient to fully fund post-closure maintenance costs and closure costs in accordance with Title 27 section 22225(a)(3). The Closure / Post-Closure Pledged Account shortfall is $2,245,144 and the Corrective Account Pledged Account shortfall is $128,363, subject to adjustments and revisions required by these WDRs. This Order requires the Dischargers to demonstrate their valid financial assurance mechanisms are funded in accordance with Title 27 section 22225(a)(3) to at a minimum, support the cost estimates summarized in **Table 12,** and annual inflation adjustments made thereafter.

198. Potential liabilities and administrative remedies for financial assurances related violations, include but are not limited to, an order to cease and desist operations (Title 27, § 22190; Wat. Code, § 13301) and/or imposition of civil liability. Potential liability amounts will take into consideration the economic benefit an operator receives from noncompliance with the regulations based on applicable factors described in Title 27 and the penalty calculation methodology described in the State Water Boards' Water Quality Enforcement Policy.

199. Filing of a false instrument with the Central Valley Water Board, a public office within the State of California, carries significant potential administrative, civil, and criminal sanctions (Wat. Code, §§ 13261, 13268; Pen. Code, § 115). In such cases, each filing of a false instrument is considered a separate violation.

California Environmental Quality Act

200. A draft environmental impact report (EIR) dated June 1991 was issued for the project that included all proposed basins (including area of the future Basins 11 through 13). Solano County certified a final EIR (State Clearinghouse No. 1989030168) for the project on 12 December 1991 in accordance with the California Environmental Quality Act (CEQA) (Pub. Res. Code, § 21000, et seq.). Solano County issued a revised Use Permit in February 1992, and minor revisions to the permit were made in 1993 and 2010.

201. Solano County Use Permit U-89-33 MR 2 is valid for a period of fifteen (15) years from approval on 6 January 2011 by Solano County, subject to the modification and revocation of certain provisions. Prior to the expiration of the permit, Solano County allows for the permittee to apply for an extension to be made in writing no later than two (2) years prior to expiration.

202. The issuance of this Order, which prescribes requirements and monitoring of waste discharges at an **existing facility**, with negligible or no expansion of its existing use, is exempt from the procedural requirements of the CEQA pursuant to California Code of Regulations, title 14, § 15301. The discharges authorized under this Order are substantially within parameters established under prior WDRs, particularly with respect to character and volume of discharges.

Other Regulatory Matters

203. This Order is issued in part pursuant to Water Code § 13263(a), which provides as follows:

> The regional board, after any necessary hearing, shall prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge…, with relation to the conditions existing in the disposal area … into which,

> the discharge is made or proposed. The requirements shall implement any relevant water quality control plans that have been adopted and shall 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] § 13241.

204. This Order implements the Central Valley Water Board's Basin Plan, which designates beneficial uses for surface water and groundwater and establishes WQOs necessary to preserve such beneficial uses.[2] (Wat. Code, § 13241 et seq.)

205. The State Water Board's *Statement of Policy with Respect to Maintaining High Quality Waters in California*, Resolution 68-16 (*Antidegradation Policy*) prohibits the Central Valley Water Board from authorizing degradation of "high quality waters" unless it is shown that such degradation: (1) will be consistent with the maximum benefit to the people of California; (2) will not unreasonably affect beneficial uses, or otherwise result in water quality less than as prescribed in applicable policies; and (3) is minimized through the discharger's best practicable treatment or control.

206. Consistent with Title 27, this Order requires the Dischargers to maintain the Facility to contain waste within WMUs, thereby preventing degradation of water quality. To the extent that there are releases from Facility WMUs, will be required to address such releases through a Corrective Action Program. (See Title 27, §§ 20385, 20415, 20430.) Because this Order does not authorize any degradation in water quality, it complies with the *Antidegradation Policy*.

207. For the purposes of Title 23section 2200, the Facility has a threat-complexity rating of **2**-**B**, where:

    a. Threat Category "2" reflects waste discharges that can impair receiving water beneficial uses, cause short-term water quality objective violations, cause secondary drinking water standard violations, and cause nuisances; and

    b. Complexity Category "B" reflects any discharger not included in Category A, with either (1) physical, chemical or biological treatment systems

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[2] Designated beneficial uses surface water and groundwater are discussed in Finding 72 and Finding 81, respectively.

(except for septic systems with subsurface disposal), or (2) any Class II or Class III WMUs.

Reporting Requirements

208. This Order is also issued in part pursuant to Water Code section 13267(b)(1), which provides that:

> [T]he regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

209. The technical reports required under this Order, as well as those required under the separately issued MRP, are necessary to ensure compliance with prescribed WDRs and the provisions of Title 27, Subtitle D (40 C.F.R. part 258) and State Water Board Resolution 93-62. Additionally, the burdens associated with such reports are reasonable relative to the need for their submission.

210. Failure to comply with the reporting requirements under this Order and the MRP may result in enforcement action pursuant to Water Code section 13268.

Procedural Matters

211. All local agencies with regulatory jurisdiction over land-use, solid waste disposal, air pollution, and public health protection have approved the use of the Facility's site for the discharge of waste to land as provided for herein.

212. The Dischargers, interested agencies, and interested persons were notified of the Central Valley Water Board's intent to prescribe the WDRs in this Order, and provided an opportunity to submit their written views and recommendations at a public hearing. (Wat. Code, § 13167.5; Title 27, § 21730.)

213. At a public meeting, the Central Valley Water Board heard and considered all comments pertaining to the discharges regulated under this Order.

214. The Central Valley Water Board will review and revise the WDRs in this Order as necessary.

REQUIREMENTS

IT IS HEREBY ORDERED, pursuant to Water Code sections 13263 and 13267, that the Dischargers and their agents, employees and successors shall comply with the following.

A. Discharge Prohibitions

Except as otherwise expressly directed below, the Dischargers shall comply with all Standard Prohibitions (SPRRs, § C), which are incorporated herein, as well as the following.

1. "**Hazardous Waste**," as defined per Title 23 section 2601, shall not be discharged at the Facility. The Department of Toxic Substances Control (DTSC) shall be immediately notified of any such discharges in violation of this Order.

2. The Dischargers shall not accept or discharge drilling muds with pH less than or equal to 2.5 or greater than or equal to 12.0.

3. The discharge of drilling mud to surface impoundments which do not meet minimum freeboard requirements set forth in Facility Specifications C.4, is prohibited.

4. The discharge of "production water," "produced water," or other non-drilling mud liquids generated by the extraction of the extraction of oil and gas resources is prohibited.

5. The discharge of solid waste or liquid wastes to surface water, surface water drainage courses, or groundwater is prohibited.

6. The discharge of wastes WMU, including truck washout water, to areas other than an authorized WMU or the lined Truck Washout Area adjacent to Basin 7, as described in Finding 61, is prohibited.

7. The Dischargers shall not commence construction, filling, or closure of Basin 9/10 without the Central Valley Water Board's written authorization.

8. The discharge of waste to Basins 11, 12, and 13 is prohibited unless and until the Dischargers retrofit the basins with liner systems and provide financial assurances meeting the requirements of this Order, and the Central Valley Water Board provides written authorization for use as set forth in the Unit Constructions Specifications of this Order, including Standard Construction Specifications and Standard Storm Water Provisions (SPRRs, §§ D, L).

B. Discharge Specifications

Except as otherwise expressly directed below, the Dischargers shall comply with all Standard Discharge Specifications (SPRRs, § D), which are incorporated herein, as well as the following.

1. The Dischargers may discharge "drilling mud" and other associated wastes described in Findings 8, 9, 10, 11, and 12 and truck washout water as described in Finding 61, subject to the table-specific definitions provided below in **Table 14** to authorized to Facility Units.

Table 14—Authorized Waste Discharges at Facility

Waste Category	Basins 7,9, 10
Hazardous Waste Wastes which, pursuant to Title 22, § 66261.3 et seq., must be managed in accordance with Division 4.5 of Title 22. (Title 27, § 20164; Title 23, § 2521(a).)	No
Designated Waste (1) Hazardous Wastes subject to a variance from management requirements per Health and Safety Code § 25143; and (2) Nonhazardous Waste containing constituents that, under ambient conditions, could be released in concentrations exceeding WQOs, or could reasonably be expected to affect beneficial uses. (Wat. Code, § 13173.)	Yes
Inert Wastes Wastes that contain neither (i) hazardous wastes or soluble pollutants at concentrations in excess of WQOs, nor (ii) significant quantities of decomposable material. (Title 27, §§ 20164, 20230(a).)	Yes

2. Separated drilling mud liquids (i.e., "top water") and any other associated drilling mud free liquids are considered a "liquid waste" and the remaining associated drilling mud components are considered "spadable" solids. In the event a dispute arises on whether a substance contains free liquids within the meaning of these WDRs, resolution may be determined by performance of the "Paint Filter Liquids Test" (USEPA Method 9095B).

3. For any authorized future construction and use of Basin 9/10, the Dischargers shall only discharge waste as described in **Table 14** for Basins 7, 9, 10 and the table-specific definitions provided therein.

4. The Dischargers shall promptly remove and relocate all waste discharged at the Facility in violation of this Order. If unable to do so, they shall submit a report to the Central Valley Water Board explaining how the violative discharge(s) occurred and why the waste(s) cannot be feasibly removed and proposing waste acceptance program updates to prevent reoccurrences. If the infeasibility is economic, cost estimates shall be provided as part of the report.[3]

C. Facility Specifications

1. The Dischargers shall comply with all Standard Facility Specifications (SPRRs, § E) which are incorporated herein.

2. Prior to accepting a load for discharge to authorized WMU(s) containing drilling mud, directional drilling wastes, and/or hydrovac wastes suspected to have originated in areas of contamination, the Dischargers shall characterize such load(s) for waste constituents. The Dischargers shall collect representative samples from vehicles and analyze the collected sample to verify wastes are not hazardous wastes or otherwise prohibited under this Order. To comply with this requirement, the Dischargers may provide documentation from waste generators who collect representative sample(s) and analyze the collected samples provide a laboratory analysis report on waste constituents. At a minimum, the required supporting documentation shall include all laboratory analytical reports (including quality assurance, quality control, and chain of custodies), a written record of the chain of custody from the time the waste leaves generator until it reaches the Facility, and a certification statement by a duly authorized representative of the waste generator that the waste is not a hazardous waste or otherwise prohibited under this Order. At all times, the Dischargers are responsible to ensure and demonstrate that the wastes the Dischargers accept at the Facility are not hazardous wastes or otherwise prohibited under this Order.

[3] Submission of this letter does not constitute approval for discharge. The Central Valley Water Board may direct the removal of waste not authorized under this Order.

3. The Dischargers shall record onsite rainfall to track the magnitude of storm events and shall record surface impoundment freeboard levels in each basin as required by MRP Order R5-20XX-XXXX.

4. The Dischargers shall maintain a minimum freeboard in Class II surface impoundments as described in **Table 7**, except as described in Facility Specification C.5. If there is no liquid in a surface impoundment at the time of the measurement, the freeboard measurement shall be taken to the lowest elevation of the drilling mud solids.

5. In the event of a storm equal to or exceeding the design storm, the Dischargers shall maintain at least 2.0 feet of freeboard for the duration of the storm event. The Dischargers shall return freeboard to minimum requirements described in **Table7** within 14 days after the occurrence of a design storm event. Any combination of "top water", rainfall, other free liquids, and/or contact storm water runoff present in a Class II surface impoundment in violation of minimum freeboard requirements must be immediately removed from the surface impoundment to another active Class II surface impoundment with available freeboard.

6. In the event that freeboard levels are not in compliance with requirements described Facility Specifications C.4 or C.5, the Discharger shall **immediately** notify Central Valley Water Board staff by telephone and electronic mail and **immediately** take measures to regain surface impoundment capacity.

7. Leachate volumes pumped from the LCRS sumps of all surface impoundments shall be measured, recorded, and reported.

8. The depth of the fluid in any LCRS sump shall be kept at the minimum needed for safe pump operation without excessive pump cycling that could damage the pump. Safe pump operation shall not result in depth of fluid exceeding 12 inches of depth on basin primary geomembrane liner.

9. Leachate removed from a surface impoundment's primary LCRS shall be discharged to the surface impoundment from which it originated, or to a different surface impoundment authorized to receive leachate wastes and with available freeboard.

10. The Dischargers shall provide formal written notice to the Central Valley Water Board at least 180 days prior to dried drilling mud elevations in Basin 9 reaching elevation 121.0 feet-msl.

11. The Dischargers shall provide formal written notice to the Central Valley Water Board at least 180 days prior to dried drilling mud elevations in Basin 10 reaching elevation 119.0 feet-msl.

12. Basins for which the Dischargers provide written notice pursuant to Facility Specifications C.10 or C.11 are in a “pre-closure” operational status and may not receive additional free liquid wastes.

13. Written notice provided to the Central Valley Water Board pursuant to Facility Specifications C.10 or C.11 shall include a closure plan which proposes clean closure of the basin pursuant to Title 27 section 21400(b)(1).

14. Written notice provided to the Central Valley Water Board pursuant to Facility Specifications C.10 or C.11 may include a request for Central Valley Water Board authorization for placement of drilling mud solids above respective elevations set forth in Facility Specifications C.10 and C.11. The request shall include a demonstration that continued drilling mud solids filling and compaction in the basin can occur above respective elevations set forth in Facility Specifications C.10 and C.11 in a manner that meets applicable standards for landfill WMUs while maintaining compliance with Title 27 requirements and these WDRs. The demonstration shall be supported by a stability analysis of the proposed completed WMU performed pursuant to Title 27 section 21750(f)(5) and which considers related elements described in Closure & Post-Closure Maintenance Specification E.1.d.

15. For basins in a “pre-closure” operational status managed as a Class II non-municipal solid waste landfill WMU, the discharge of wastes with moisture holding capacity in excess of the waste is prohibited (Title 27, §§ 20200(d), 21400(b)(2)(A)).

16. The Dischargers shall maintain capacity to contain liquid released from wastes contained in a basin due to compressive forces of accumulated wastes and design precipitation while maintaining the minimum freeboard requirements described in **Table 7** unless and until the Dischargers demonstrate to the written satisfaction of the Central Valley Water Board that the WMU is managed in a manner that meets all applicable standards for a Class II non-municipal solid waste landfill WMU.

17. The Dischargers shall immediately remove free liquids present in excess of minimum freeboard requirements.

18. Leachate collected from an LCRS of a basin in a “pre-closure” operational status shall be discharged to an authorized Class II surface impoundment with available freeboard as described in **Table 7**.

19. Contact storm water runoff from basins in a “pre-closure” operational status may be discharged to a different authorized basin with available freeboard as described in **Table 7**.

20. Storm water from areas with interim cover or final cover may be directed to the storm water drainage system.

21. The **Action Leakage Rate** (ALR) for double-lined Class II surface impoundments shall be calculated as their approximate area in acres times 1,000 gpd. Any new Class II surface impoundment shall have an ALR calculated by this method as part of its design. The ALR for Basin 7 is 4,000 gpd or 120,000 gallons over a 30-day period. The ALR for Basin 9 is 5,000 gpd or 150,000 gallons over a 30-day period. The ALR for Basin 10 is 4,000 gpd or 120,000 gallons over a 30-day period. If leachate generation in the LCRS of a Class II surface impoundment exceeds its ALR, the Discharger shall:

    a. Immediately notify Central Valley Water Board staff by telephone and email.

    b. Submit written notification within seven days that includes a time schedule to locate and repair leak(s) in the liner system or take other actions to mitigate the exceedance.

    c. If repairs or other actions do not result in a leakage rate less than the required ALR, the Discharger shall submit written notification within seven days that includes a time schedule for replacement of the upper liner of the surface impoundment or other action necessary to reduce leachate production below the ALR.

    d. Complete repairs, other actions, or liner replacement in accordance with the approved time schedule under “b” and/or “c”, above.

22. If monitoring of a lysimeter and/or gypsum moisture block unsaturated zone monitoring system for a Class II surface impoundment indicates a leak in the containment structures, the Discharger shall:

a. **Immediately** notify Central Valley Water Board staff by telephone and email that the containment structures may have failed.

b. **Immediately** conduct resampling of the suction lysimeter and test the liquid in accordance with the unsaturated zone monitoring requirements in MRP Order R5-2014-0105.

c. **Within seven days,** submit the resampling results and if re-sampling confirms the release, submit written notification of the release to Central Valley Water Board staff including a time schedule to repair the containment structures or take other actions to mitigate the leak.

d. Complete repairs of the containment structures or other actions in accordance with the approved time schedule.

23. The Dischargers shall maintain at least two surveying monuments, installed by a Professional Land Surveyor for the purpose of locating wastes, containment structures, and monitoring facilities throughout the post-closure period. The Dischargers shall provide protection for survey monuments throughout the post-closure period.

D. Unit Construction Specifications

Except as otherwise expressly directed below, the Dischargers shall comply with all Standard Construction Specifications and Standard Storm Water Provisions (SPRRs, §§ D, L), which are incorporated herein, as well as the following.

1. Containment structures and precipitation and drainage control systems shall be constructed and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, and washout under 1,000-year, 24-hour precipitation conditions.

2. WMUs shall be designed, constructed, and operated to prevent inundation or washout due to flooding events with a 100-year return period.

3. All LCRS pumps shall be capable of removing design volumes of leachate and/or 150 percent of the ALR flow, whichever is greater.

4. Except as authorized in **Section D.6**, the Dischargers shall not commence liner construction (other than preparatory earthmoving and grading) until the Central Valley Water Board has approved in writing all necessary construction plans, specifications, and construction quality assurance plans related to the new liner(s).

5. New Class II surface impoundment liner systems shall consist of the following minimum components, from the top down;

    a. A primary 60-mil High Density Polyethylene (HDPE) geomembrane.

    b. A geonet LCRS drainage layer.

    c. A secondary 60-mil HDPE geomembrane.

    d. A one-foot thick compacted soil layer with maximum hydraulic conductivity of 5x10E-7 cm/s.

6. Surface impoundments where heavy equipment operations, including but not limited to, use of low ground pressure compaction equipment, scrapers, and/or front loaders, may occur shall have a two-foot soil operations layer with a colored (e.g., orange, yellow) geotextile at the midway point of the operations layer. The operations layer soil shall be fine-grained and contain no rocks that could puncture the primary liner. Any operations layer soil or geotextile encountered during drilling mud processing shall be replaced such that the thickness of the operations layer and position of the geotextile is maintained.

7. Base liners and slope liners for **new or retrofitted WMUs** shall be constructed with the liner system and LCRS depicted in **Attachment D** and Operations layer described in **Unit Construction Specification D.6**.

8. New or retrofitted Class II surface impoundments shall have at least one downgradient groundwater monitoring well as part of their design. The well shall be installed and sampled prior to acceptance of waste in the impoundment and shall be monitored in accordance with groundwater detection monitoring requirements in MRP Order R5-2024-XXXX and any subsequent revisions thereto.

9. Class II surface impoundments shall have an unsaturated zone monitoring system beneath the sump area of the impoundment.

10. The Basin 9 maximum elevation shall not exceed 121.0 feet msl, without authorization from the Central Valley Water Board.

11. The Basin 10 maximum elevation shall not exceed 119.0 feet msl, without authorization from the Central Valley Water Board.

12. Central Valley Water Board written authorization is required before the Dischargers may fill Basin 9/10 (Unit Construction Specification D.13).

13. Prior to construction of Basin 9/10, the Dischargers shall submit a report for Central Valley Water Board review and approval. At a minimum, the report shall include the following items:

    a. The elements described in Closure and Post-Closure Maintenance Specification E.1. The stability analysis for the proposed completed WMU shall be performed pursuant to Title 27 section 21750(f)(5), consider related elements described in Closure & Post-Closure Maintenance Specification E.1.d, and consider stability analyses performed pursuant to Facility Specification C.14;

    b. A proposal for maintaining capacity to contain residual liquid wastes and design precipitation quantities while maintaining minimum freeboard requirements described by Facility Specification C.16; and

    c. An evaluation of the integrity of both Basin 9 and Basin 10 containment systems and LCRSs, including an evaluation of the integrity of the containment system overlap (Attachment I) functionality as a continuous containment system. The integrity evaluation shall also consider susceptibility of containment systems and LCRSs to damage due to crushing forces resulting from overburden and construction loads.

14. The Discharger shall include as part of any proposed design, a demonstration of satisfaction of financial assurance requirements for new or retrofitted WMUs, as described in Financial Assurance Specification F, below.

15. The Dischargers shall not implement changes to approved liner and LCRS design in **Attachment D** until the Central Valley Water Board approves of the proposed changes in writing, provided that the proposed changes meet the following minimum standards:

    a. Previously approved components are not eliminated;

    b. The engineering properties of previously approved components are not substantially reduced; and

c. The proposed liner system will result in water quality equal to or greater than the design(s) prescribed per Title 27 section 20310 et seq., and this Order.[4]

E. Closure & Post-Closure Maintenance Specifications

Except as otherwise directed below, the Dischargers shall comply with all Standard Closure and Post-Closure Specifications (SPRRs, § G) and closure-related Standard Construction Specifications (SPRRs, § F), as well as the following with respect to closure of landfills at the Facility.

1. **By 1 July 2024**, the Dischargers shall submit a consolidated and updated the CPMP for all Facility WMUs listed in **Table 1.** For each WMU, the CPMP shall address all elements required by Title 27 § 20950, § 21090, and § 21769, including but not limited to the following:

   a. A final cover design, grading plan, and maintenance;

   b. Identification and location of surveying monuments;

   c. An updated cost estimate for closure costs and for annualized post-closure costs, supported by sufficient detail to validate the plausibility of the estimate;

   d. Stability analyses performed pursuant to these and previous WDRs for double-lined Class II surface impoundments closed as landfills using the peak ground acceleration from the Maximum Credible Earthquake as required by Title 27. The stability analysis shall reconcile all previous slope stability analyses performed for the Facility, including in the 2014 ROWD, the 16 October 2015 site-specific seismic analysis, and the 4 August 2022 ROWD. The Dischargers may employ an alternative methodology to determine the MCE and MPE and identify seismic ground motion parameters under the known geologic framework provided a certification statement and supporting analysis accompanies the stability analysis which affirms that such alternative methodology to determine the MCE and MPE satisfies the requirements of Title 27

[4] Proposed changes that do not meet these criteria are considered “material,” and will require the revision of this Order.

section 20370 and may serve as the basis for static and dynamic slope stability analyses for the Facility;

e. A general description of the planned final cover or grading plan for Basin 7; and

f. Financial Assurances components required by Title 27, including as set forth in Financial Assurance Specification F.7 below.

2. The Dischargers shall submit a Final or Partial Final CPMP, in accordance with section G of the SPRRs, at least two years prior to the proposed closure of any portion of any WMU.

3. The Discharger shall clean close Class II surface impoundments pursuant to Title 27 section 21400(b)(1), except as provided for in Closure & Post-Closure Maintenance Specification E.5. Partial or final closure of a Facility Class II surface impoundment shall not occur without Central Valley Water Board authorization. Closure shall be conducted as required by this Order.

4. Clean closure of Class II surface impoundments shall consist of removing all water, drilling mud, liner materials, and adjacent natural geologic materials contaminated by wastes. Drilling mud, soil liner materials, and contaminated natural geologic materials may be discharged to a Class II surface impoundment that is accepting dried drilling mud. Geotextiles shall either be recycled or discharged to an offsite permitted landfill facility. The area shall be backfilled to approximate surrounding natural grade and graded to drain.

5. The Dischargers may request the Central Valley Water Board to consider closure of Facility Class II surface impoundments as a landfill pursuant to Title 27 section 21400(b)(2)(A) by including the request in a closure plan submitted to the Central Valley Water Board. For each Class II surface impoundment, a request made pursuant to Title 27 section 21400(b)(2)(A) shall include an evaluation of and make recommendations regarding the feasibility of clean closure of the surface impoundment and include removal of all free liquid and treatment of any residual liquid at the time of closure and filling the Class II surface impoundment to final grade with compacted in place dried drilling mud.

6. Class II surface impoundments closed as landfills shall have external side slopes with maximum steepness of 4 horizontal: 1 vertical and the top deck shall have a minimum 3 percent slope for drainage.

7. The Dischargers shall close WMUs with the final cover components proposed in the ROWD and as approved per Finding 168 and **Attachment G**.

8. The Dischargers shall obtain revised WDRs prior to closure of any WMUs with a final cover other than the one(s) approved herein.

9. During or after partial or final cover installation, the Dischargers may perform minor modifications to problematic areas of the final cover, provided that: (a) the barrier layer of the final cover (e.g., geomembrane, GCL, and/or compacted clay layer) remains intact; and (b) the Central Valley Water Board approves of such modifications.

10. If the partial or final cover incorporates a geomembrane barrier, all edges of the final cover shall be sealed by connecting to the liner.

11. The Dischargers shall apply a volume of seed, binder, and nutrients to the vegetative/erosion-resistant layer sufficient to establish the vegetation proposed in the preliminary or final closure plan. The Dischargers shall also install any necessary erosion and sedimentation controls to protect vegetation while it is being established.

12. Critical interfaces of the partial or final cover shall be laboratory-tested to ensure minimum design shear strength. The results of such testing shall be reported to the Central Valley Water Board as part of the Construction Quality Assurance (CQA) Report.

13. The Discharger shall perform all post-closure maintenance activities specified in the Facility's Final CPMP that are not specifically referred to in this Order.

14. Post-closure maintenance shall be conducted for a minimum period of 30 years or until the Central Valley Water Board finds that the waste no longer poses a threat to environmental quality, whichever is greater pursuant to Title 27 sections 21180(a) and 21900(a).

F. Financial Assurances

Except as otherwise directed below, the Dischargers shall comply with all Standard Financial Assurance Provisions (SPRRs, § H), as well as the following.

1. The Dischargers shall use one or more acceptable financial mechanisms, with the Central Valley Water Board as the beneficiary, to maintain assurances of financial responsibility in at least the estimated cost amounts specified for each category in Finding 183, including Table 12, and as adjusted to the updated estimated costs amounts required

pursuant to Financial Assurances F.4 in accordance with Title 27, adjusted annually for inflation.

2. Closure/post-closure maintenance irrevocable trust fund balance calculations shall be made in accordance with the formula specified in Title 27 section 22225. Acceptable financial mechanisms shall be fully funded at the time the Dischargers receive and discharge the final shipment of waste into a basin (Title 27, § 22225(a)(3)), plus inflation in accordance with Title 27 section 22236.

3. Groundwater corrective action fund balance calculations shall be made in accordance with the formulas in Title 27 section 22226. The Dischargers shall make payment to the corrective action fund in at least the amount that the fund would contain if the fund were established initially and annual payments shall be made in accordance with the formulas in Title 27 section 22226, plus inflation in accordance with Title 27 section 22236. (Title 27, § 22226(a).)

4. By **1 July 2024**, the Dischargers shall submit for Central Valley Water Board review and approval updated closure and post-closure maintenance costs for each Basin in 2024 dollars. The cost estimate shall consider mandatory clean-closure of class II surface impoundments (Title 27, §§ 21400(b)(1), 20380) unless and until the Central Valley Water Board authorizes a fallback closure option, pursuant to Title 27 section 21400(b)(2)(A), according to the schedule specified in in **Table 15**.

Table 15—Updated Cost Estimate Needs

Basin	Requirement
Basin 2	Post-Closure Maintenance, as a landfill, fully funded
Basin 3	Post-Closure Maintenance, as a landfill, fully funded
Basin 4	Post-Closure Maintenance, as a landfill, fully funded
Basin 5	Post-Closure Maintenance, as a landfill, fully funded
Basin 7	Closure as Class II Surface Impoundment, Post-Closure Maintenance
Basin 9	Closure as Class II Surface Impoundment, Post-Closure Maintenance
Basin 10	Closure as Class II Surface Impoundment, Post-Closure Maintenance

5. Where the Central Valley Water Board provides written authorization for a fallback closure option for a basin pursuant to Title 27 section 21400(b)(2)(A), the Dischargers may modify the cost estimate to consider

closure of the WMU as a landfill in lieu of costs required for clean-closure of the WMU as a class II surface impoundment, as identified in the schedule specified in **Table 15**.

6. Excluding required annual deposits required by these WDRs, the Dischargers shall not make, or cause to be made, any orders, requests, or instructions to the Trustee for the Closure / Post-Closure Pledged Account or the Corrective Action Pledged Account without the written authorization of the Central Valley Water Board.

7. Any attestations, certifications, or statements of authenticity made by a named Trustee, its agents, employees, or representatives regarding financial assurances documents or reports required by this Order shall be made on the named Trustee's letterhead by a representative, employee, or agent duly authorized to make attestations, certifications, or statements of authenticity on behalf of the named Trustee. The Central Valley Water Board reserves the right to make orders, requests, and issue administrative subpoenas to named Trustee(s) to verify the authenticity and adequacy of financial mechanisms and/or provide additional information relating to financial assurance mechanisms maintained on behalf of the Dischargers and which relate to this Order.

8. By **1 November of each year**, the Dischargers shall submit an annual financial assurances report to the Central Valley Water Board. The annual financial assurances report shall be a single report that provides the required financial assurances information pursuant to Financial Assurance specifications F.1 through F.3, above. The annual financial assurances report shall include the following elements:

    a. Report of the balance of the Closure / Post-Closure Pledged Account, and Corrective Action Pledged Account and the adjustments to the respective funds for inflation in accordance with Title 27 section 22236;

    b. A demonstration that the Dischargers have funded the financial assurance mechanisms in accordance with the required minimum annual deposits for closure, post-closure maintenance, and corrective action financial assurances;

    c. The methodology used for calculating the minimum deposits in accordance with the required sections of Title 27 referenced in the above Financial Assurances specifications, and shall include

documentation of the information required under Title 27 section 22225 used in the calculations;

d. Copies of the Trustee's statements confirming the value of the Closure / Post-Closure Pledged Account and the Corrective Action Pledged Account;

e. A statement and description regarding orders, requests, and instructions made (or absence thereof) by Aqua Clear Farms, Inc. to the Trustee regarding the Closure / Post-Closure Pledged Account and/or the Corrective Action Account; and

f. Copies of all orders, requests, and instructions, if any, made by Aqua Clear Farms, Inc. to the Trustee regarding the Closure / Post-Closure Pledged Account and/or the Corrective Action Account.

9. By **1 November 2024,** demonstrate the financial mechanisms are fully funded as set forth in Financial Assurances F.1. The Discharger may include the demonstration in the annual financial report required pursuant to Financial Assurances F.8.

10. A request submitted pursuant to Facility Specifications C.14 may include a request to modify financial assurance requirements for the Unit to align with the nature of the Dischargers' operation and the solids characteristics of the in-place drilling muds discharged to a Unit managed as a Class II non-municipal solid waste landfill. The request shall include an updated cost estimate for closure costs and for annualized post-closure costs, supported by sufficient detail to validate the plausibility of the estimate. The Dischargers shall not implement modifications to financial assurance requirements without written Central Valley Water Board authorization.

11. If the Central Valley Water Board determines that the submitted financial assurances for the Facility are inadequate, the Dischargers shall, within 90 days of such determination:

a. Obtain a new financial assurance mechanism for the amount specified by Central Valley Water Board; and

b. Submit a report documenting such financial assurances to the Central Valley Water Board.

12. Whenever changed conditions increase the estimated costs of closure and post-closure maintenance, the Dischargers shall promptly submit an updated CPMP to the Central Valley Water Board.

G. Monitoring Requirements

Except as otherwise directed below, the Dischargers shall comply with all applicable Standard Monitoring Specifications (SPRRs, § I) and Standard Response to Release Specifications (SPRRs, § J), as well as the following:

1. The Dischargers shall comply with all provisions of the separately issued Monitoring And Reporting Program (MRP) Order R5-2024-XXXX and any subsequent revisions thereto (operative MRP).

2. The Dischargers shall implement the Water Quality Protection Standard (WQPS) set forth in the operative MRP (see also Title 27, § 20390); and shall verify the compliance of each WMU with each subsequent monitoring event.

3. For all WMUs, the Dischargers shall implement a groundwater, surface water and unsaturated zone detection monitoring program (DMP) in accordance with Title 27 sections 20385, 20415, and 20420.

4. For each WMU subject to corrective action, the Dischargers shall implement a corrective action monitoring program (CAMP) in accordance with Title 27 sections 20385, 20415, and 20430, and Section I of the SPRRs.

5. Annually, prior to the anticipated rainy season but no later than **1 November**, any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed and reported in compliance with the operative MRP.

H. Reporting Requirements

In addition to those Standard Provisions pertaining to notification and reporting obligations (see, e.g., §§ K.1-2, K.6, K.8-10), the Dischargers shall comply with the following provisions.

1. The Dischargers shall comply with all provisions of the operative MRP pertaining to the submittal and formatting of reports and data.

2. Reports shall be submitted electronically via the State Water Board's GeoTracker Database (https://geotracker.waterboards.ca.gov). After uploading, the Dischargers shall notify Central Valley Water Board staff via email at CentralVallySacramento@WaterBoards.ca.gov. The following information shall be included in the body of the email:

   Attention: Title 27 Compliance & Enforcement Unit
   Report Title: [Report Title]

GeoTracker Upload ID: L10001773161
Facility: Aqua Clear Farms
County: Solano County
CIWQS Place ID: 206099

3. All technical reports submitted under this Order shall be prepared by, or under the direct supervision of, a California-licensed civil engineer or engineering geologist. For the purposes of this section, a "technical report" is a report incorporating the application of scientific or engineering principles.

I. Time Schedule

The Dischargers shall complete the following tasks in accordance with the specified deadlines:

Table 16—Time Schedule

Item No.	Category	Task	Deadline
1.	Construction	Submit construction and design plan(s) for review and approval in accordance with Section D of this Order, and Section F of the SPRRs.	90 Days Prior to Proposed Construction
2.	Construction	Submit construction report(s) for review and approval upon completion demonstrating construction was in accordance with approved construction plans and Section F.27 of the SPRRs.	60 Days Prior to Proposed Discharge to Unit(s)
3.	Final Closure	Submit final or partial final closure and post-closure maintenance plan, design plans, and CQA plan for review and approval, in accordance with Section E of this Order and Section G of the SPRRs.	2 Years Prior to Closure
4.	Pre-Closure Notice, Basin 9	Provide written notice to the Central Valley Water Board prior to dried drilling mud elevations in Basin 9 reaching elevation 121.0 feet-msl	180 days prior to 121.0 feet msl

Item No.	Category	Task	Deadline
5.	Pre-Closure Notice, Basin 10	Provide written notice to the Central Valley Water Board prior to dried drilling mud elevations in Basin 10 reaching elevation 119.0 feet-msl	180 days prior to 119.0 feet msl
6.	Financial Assurances	Updated cost estimates for closure and post-closure maintenance costs for each Basin (Financial Assurances F.4)	**1 July 2024**
7.	Financial Assurances	Submit an annual financial assurances report to the Central Valley Water Board (Financial Assurances F.10)	1 November Annually
8.	Financial Assurances	Demonstrate the financial mechanisms are fully funded (Financial Assurances F.11)	**1 November 2024**
9.	Closure Plan	Submit consolidated and updated Closure and Post-Closure Maintenance Plan for all Facility Waste Management Units (Closure and Post-Closure Specification E.1)	**1 July 2024**
10.	Operations Plan	Submit Impoundments Operations Plan	1 October Annually
11.	Corrective Action	Submit Workplan for installation of groundwater extraction wells	**1 July 2024**
12.	Monitoring Well 6 Workplan	Submit a workplan for evaluation of Monitoring Well 6	**1 May 2024**
13.	Monitoring Well 6 Technical Report	Submit a technical report regarding repairs made to Monitoring Well 6	Within 90 days of approval of Monitoring Well 6 Workplan

Item No.	Category	Task	Deadline
14.	Evaluation Monitoring Plan	Submit a report which describes the completion of the EMP investigation to define the vertical and lateral extent of the groundwater impacts	31 December 2024

J. Other Provisions

1. The Dischargers shall maintain at the Facility copies of this Order (including all attachments), the operative MRP, and the SPRRs. These materials shall be made available to all operating personnel, who shall be familiar with the contents of such materials.

2. The Dischargers shall comply with all applicable provisions of Title 27 (including those provisions not specifically referenced herein).

3. By **1 October** of each year, the Dischargers shall submit an **Impoundments Operation Plan** for operating the surface impoundments over the upcoming 12-month period. The Annual Impoundments Operations Plan shall identify the surface impoundments scheduled for accepting drilling mud/fluid and the available capacity for the upcoming 12-month period. The plan shall specify the conditions under which drilling mud will be transferred between surface impoundments (e.g., depth of solids in an impoundment, percent moisture of solids, etc.) and conditions under which liquids will be transferred between surface impoundments. Figures/schematics showing a plan view and cross-section of each active surface impoundment shall be provided. The figures/schematics shall show the total depth of the impoundment; the filling plan showing the change in depth of solids over time; the location for the discharge of waste into the surface impoundments; and the locations for drying and conditioning of solids within each surface impoundment. In addition, the planned location for pooling and evaporation of liquids shall be depicted. The Dischargers shall include a water balance demonstrating that each basin in a “pre-closure” operational status can maintain capacity to contain liquid released from wastes contained in each basin due to compressive forces of accumulated wastes and design precipitation while maintaining the minimum freeboard requirements required by these WDRs. If solids are planned to be moved around within a surface impoundment, then this information shall be depicted on the figures/schematics.

4. By **1 July 2024**, the Dischargers shall submit a workplan to install the expanded groundwater extraction system as described in the 30 December 2022 modification to the 2016 Engineering Feasibility Study.

5. By **31 December 2024**, the Dischargers shall submit a report which describes the completion of the EMP investigation to define the vertical and lateral extent of the groundwater impacts due to activities at the Facility. At each temporary boring, at least one representative grab groundwater sample shall be obtained and shall be analyzed for analytical parameters listed in the operative MRP, Table 2 and Table 3. Step-out/step-down investigation shall continue whenever field test results exceed any of the concentration limits described in the operative MRP, Table 16. In completing the EMP investigation, the Dischargers shall employ step-out/step down procedures based upon field results confirmed by laboratory analyses. The report shall include a workplan to install permanent sentry wells just beyond the boundary of the defined lateral and vertical extent of groundwater impacts in order to monitor any expansion of the groundwater impacts.

6. By **1 May 2024** the Dischargers shall submit a workplan for evaluation of MW-6 to ensure the condition of MW-6 conforms with the State Department of Water Resources' Bulletins 74-81 and 74-90 (California Well Standards). The workplan shall make recommendations for repairs, inf any to MW-6.

7. **Within 90 days of** Central Valley Water Board approval of the MW-6 workplan required by Provisions J.5, the Discharger shall submit a technical report to the Central Valley Water Board which describes, and documents repairs made to MW-6.

LIST OF ATTACHMENTS

Attachment A—Site Location **MAP**Map
Attachment B—Facility Map
Attachment C—GAMA Program Well **SURVEY MAP** Survey Map
Attachment D—Typical Liner System & LCRS Detail
Attachment E—Former Truck Washout Area
Attachment F—Current Truck washOUT Area & Basin 7
Attachment G—Engineered Alternative Final **COVER PROFILE**Cover Profile
Attachment H—Final Waste Elevations
Attachment H—**FINAL** Basin 9 and 10 Liner Overlap

Standard Provisions and Reporting Requirements for Non-Hazardous Discharges of Waste Regulated under Subtitle D and/or Title 27, December 2015 Edition (SPRRs or Standard Provisions)

Information Sheet

Monitoring and Reporting Program Order R5-20XX-XXXX (separate document)

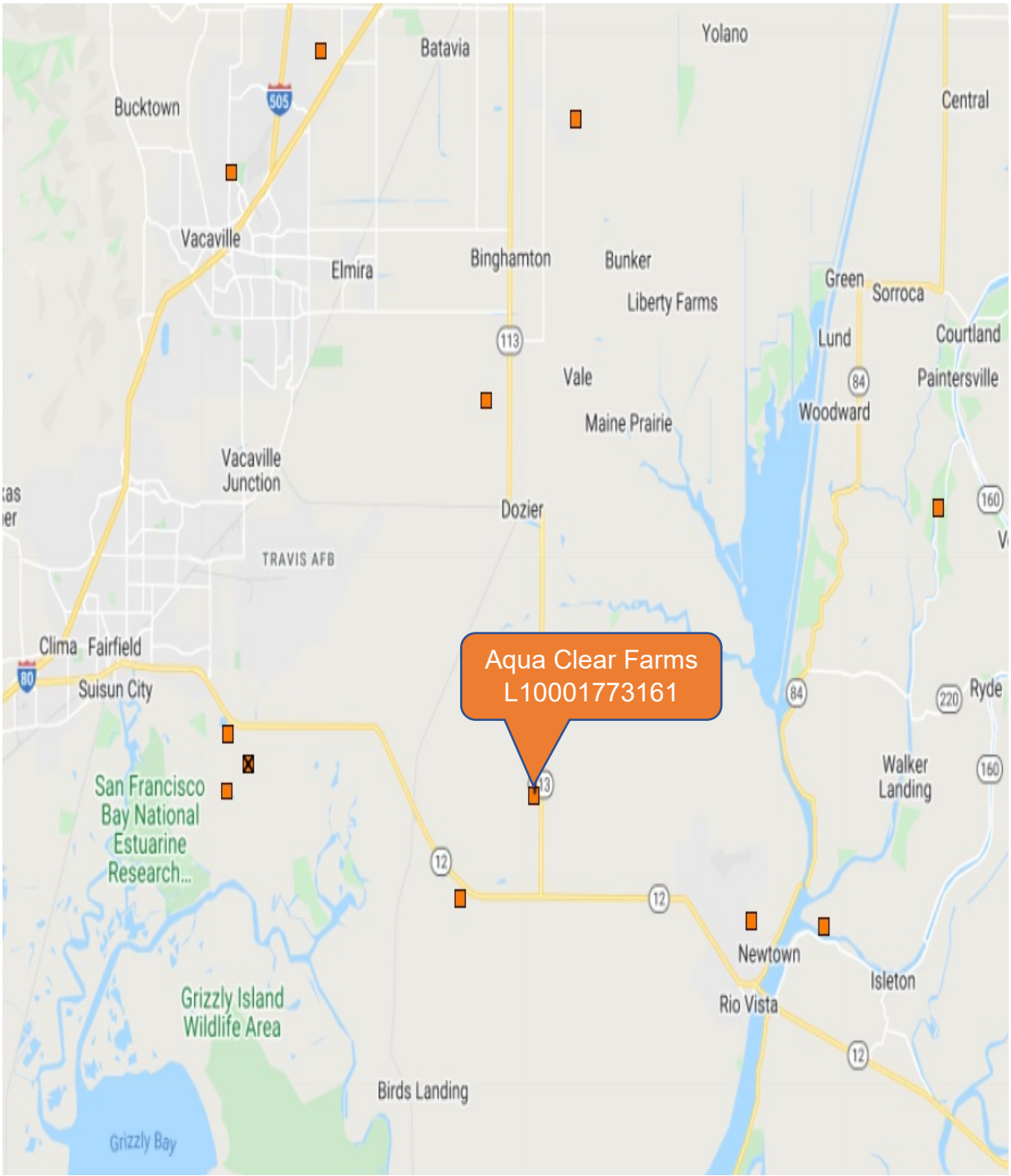
ENFORCEMENT

If, in the opinion of the Central Valley Water Board, the Dischargers fail to comply with the provisions of this Order, the Central Valley Water Board may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350, and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

ADMINISTRATIVE REVIEW

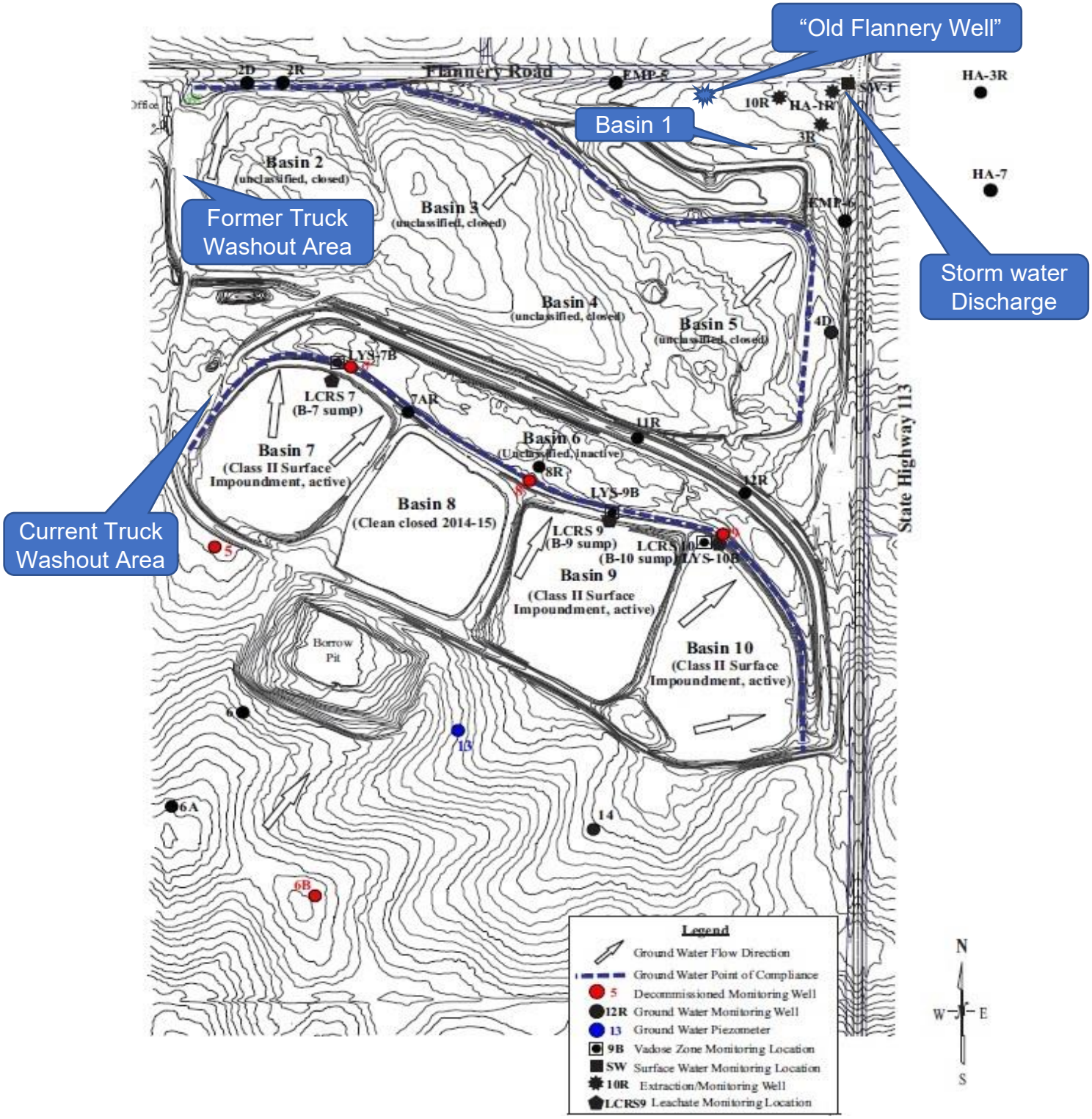
Any person aggrieved by this Central Valley Water Board action may petition the State Water Board for review in accordance with Water Code § 13320 and California Code of Regulations, title 23, §§ 2050 et seq. To be timely, the petition must be received by the State Water Board by 5:00 pm on the 30th 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 pm on the next business day. The law and regulations applicable to filing petitions are available on the State Water Board website (http://www.waterboards.ca.gov/public_notices/petitions/water_quality). Copies will also be provided upon request.

ATTACHMENT A—SITE LOCATION MAP



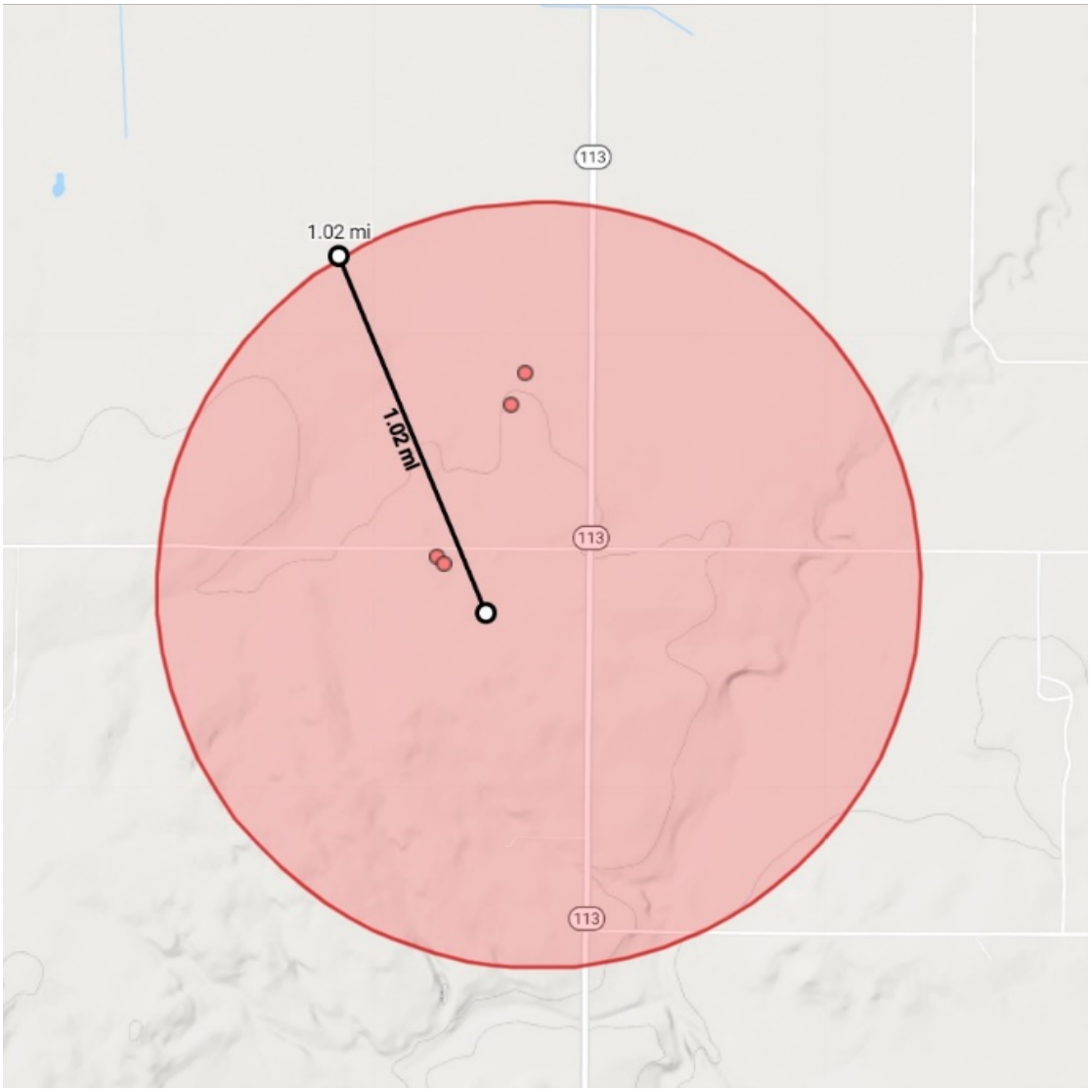
Aqua Clear Farms, NTS, GeoTracker® 2022

ATTACHMENT B—FACILITY MAP



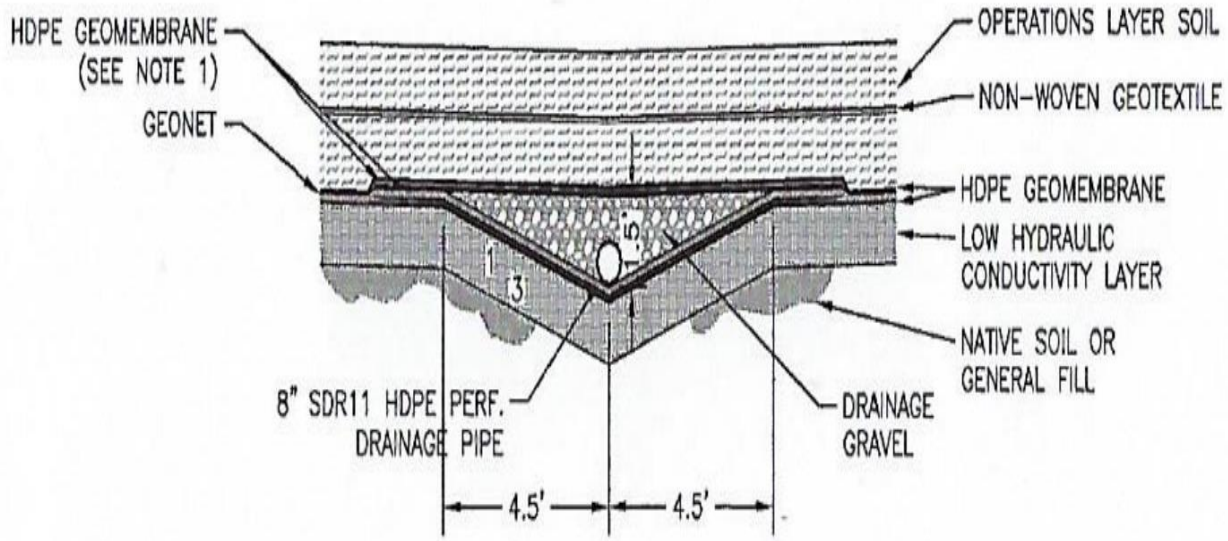
Facility Site Map, NTS (ROWD, Figure 5, August 2022)

ATTACHMENT C—GAMA PROGRAM WELL SURVEY MAP



Approximate location of wells known to the GAMA Program within 1 mile of the Facility.

ATTACHMENT D—TYPICAL LINER SYSTEM & LCRS DETAIL

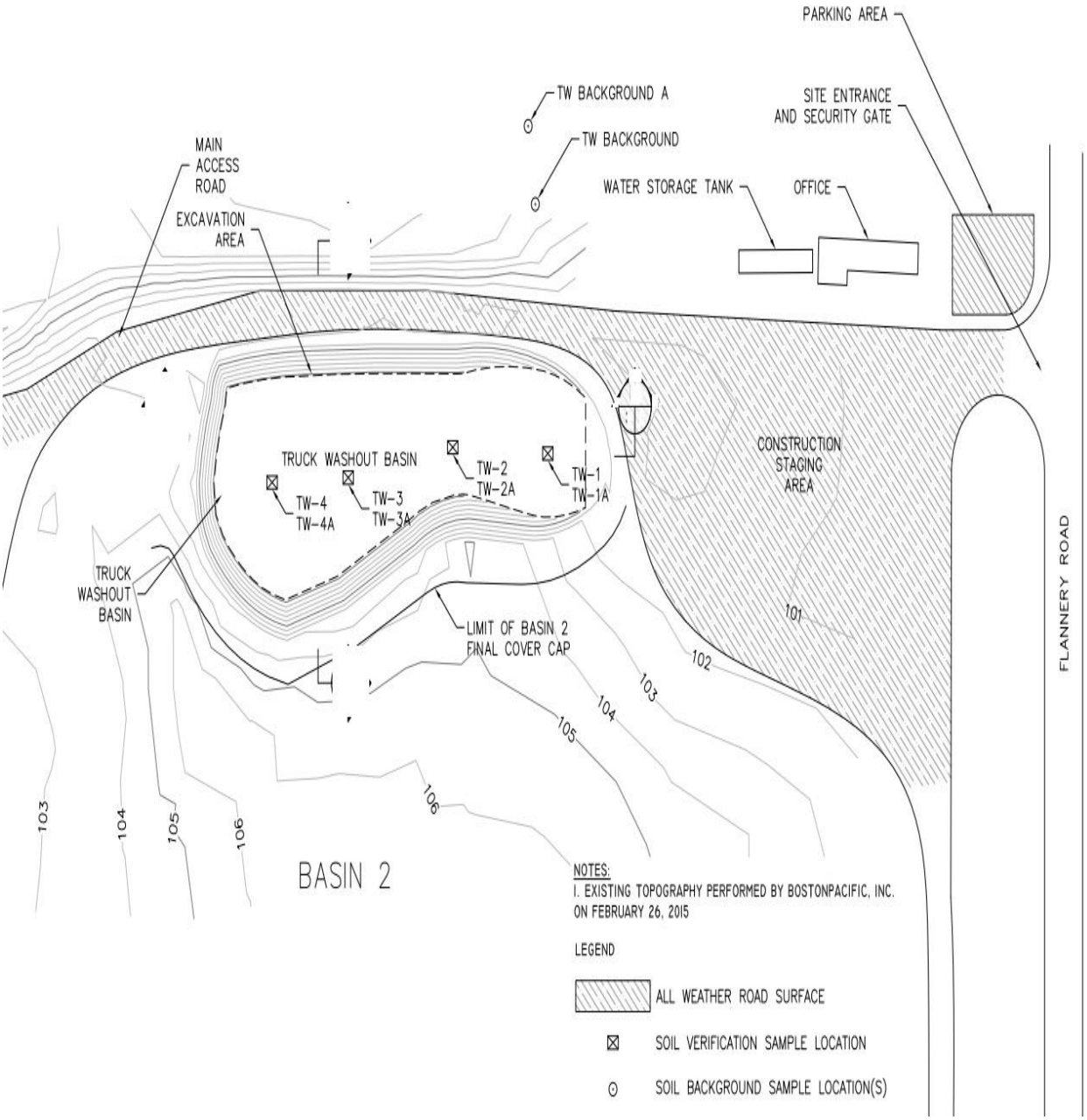


NOTES:

1. ONE ADDITIONAL LAYER OF GEOMEMBRANE SHALL BE PLACED AS A RUB SHEET OVER THE SECONDARY GEOMEMBRANE UNDER THE GEONET AND ANOTHER ON TOP OF THE DRAINAGE GRAVEL. HDPE SHEET SHALL EXTEND TO THE TOP OF THE SLOPES OF THE LEVEE AND EXTEND 2' LATERIALLY BEYOND THE TOP OF THE SWALE. NO SEAMING IS REQUIRED.

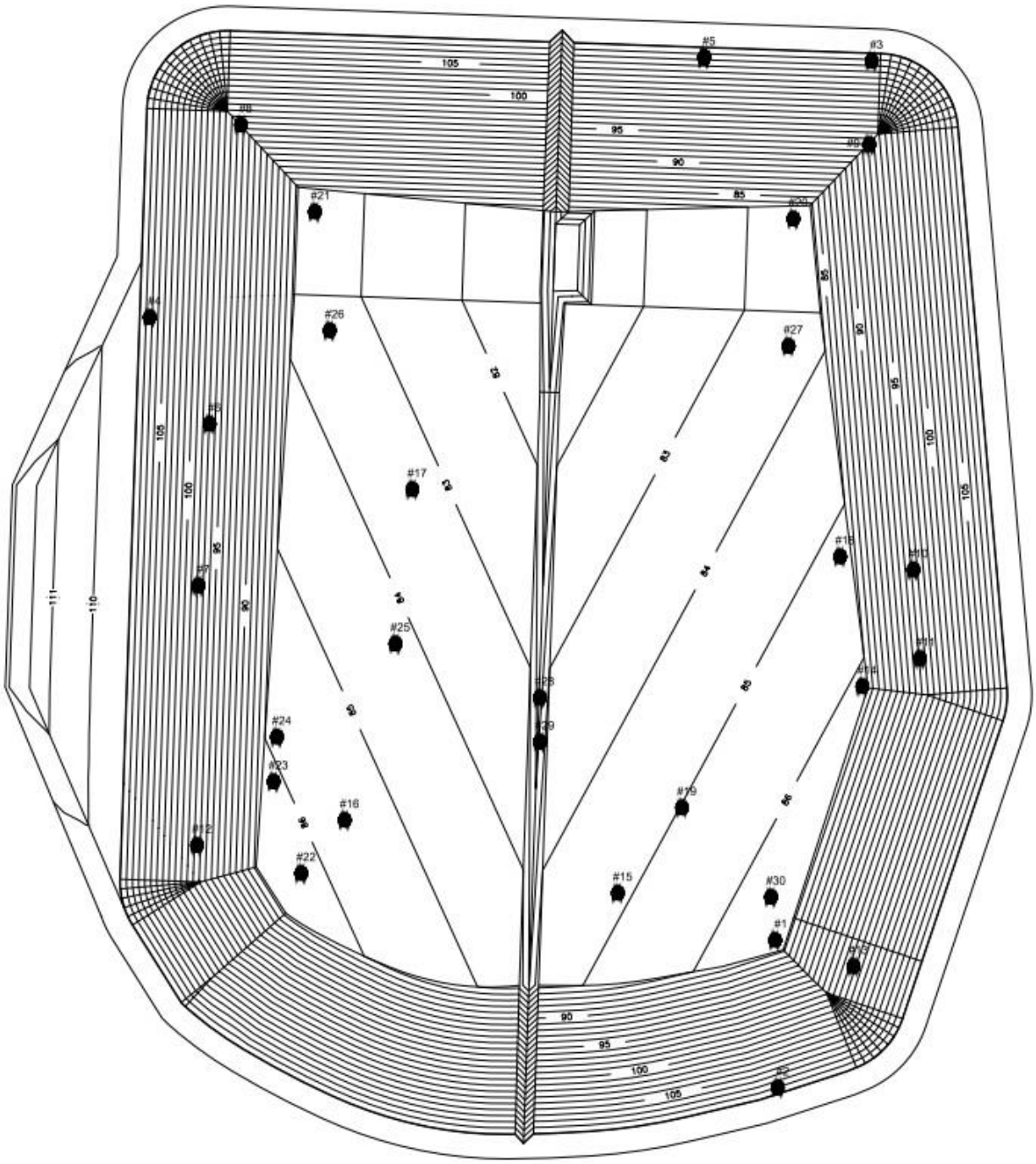
WMU Typical Liner System and LCRS detail, The Seres Group, November 2021.

ATTACHMENT E—FORMER TRUCK WASHOUT AREA



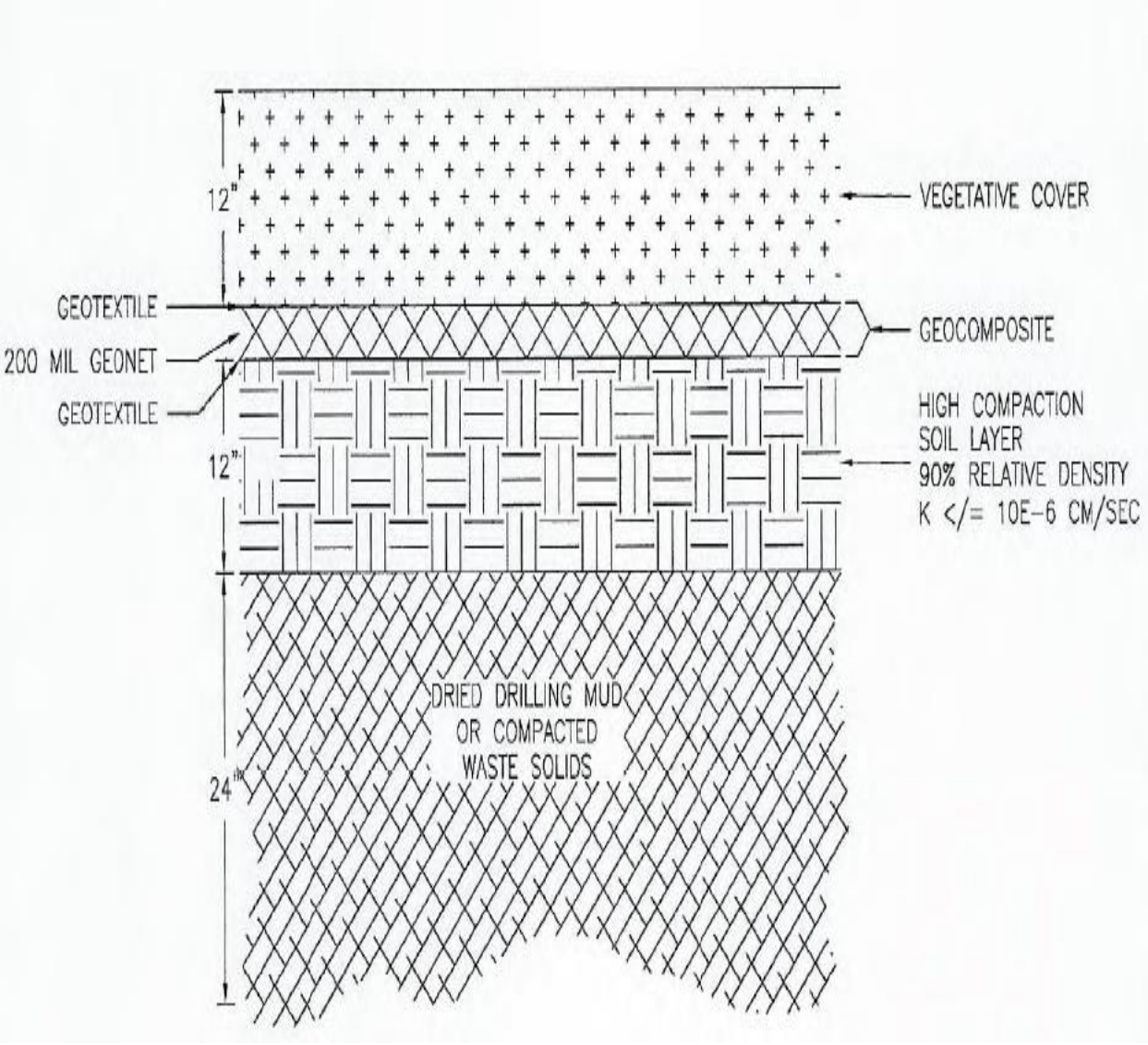
Former Truck Washout Area, NTS, The Seres Group, January 2016

ATTACHMENT F—CURRENT TRUCK WASHOUT AREA & BASIN 7



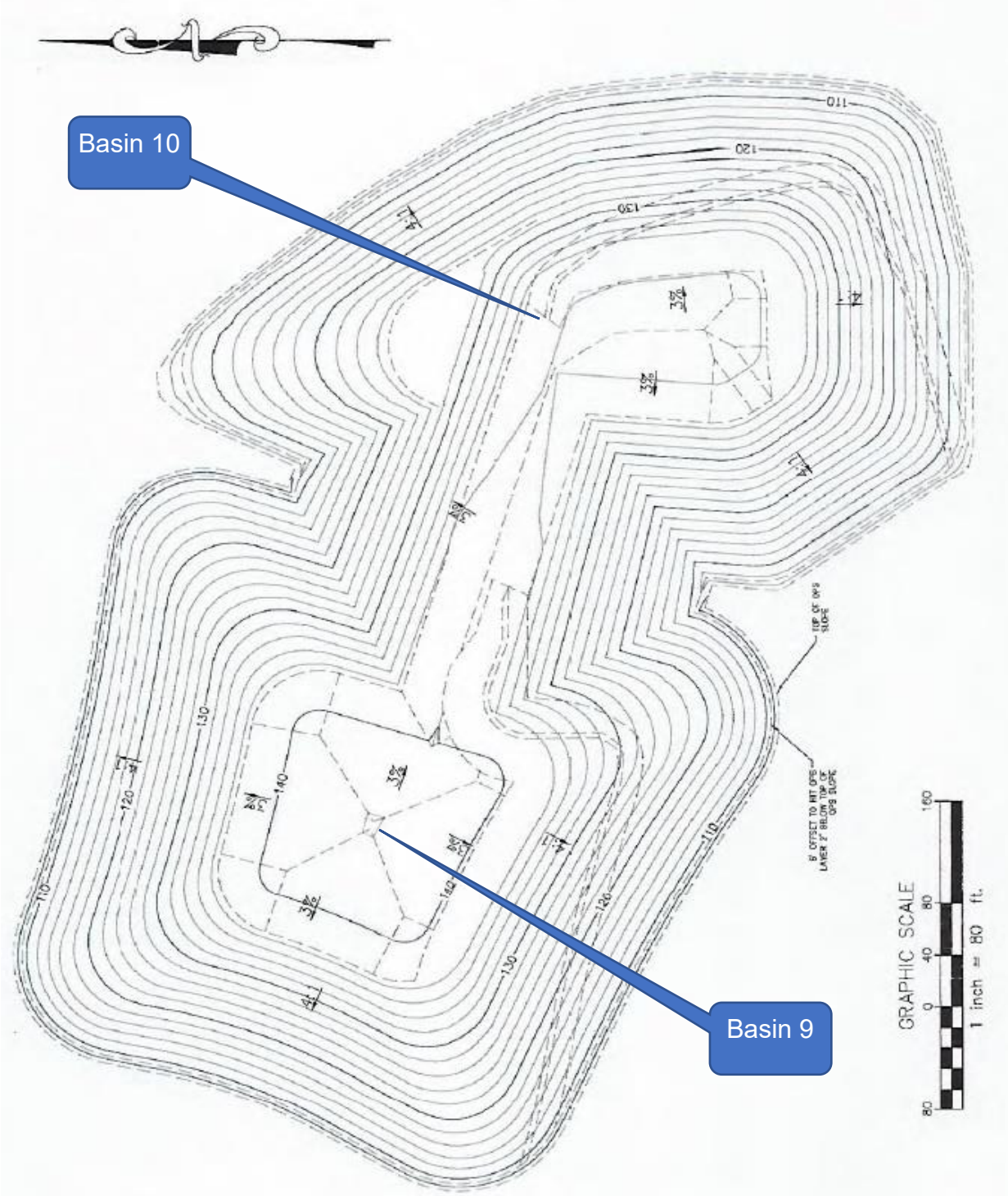
Current Truck Washout Area and Basin 7, NTS, Kleinfelder, January 2018

ATTACHMENT G—ENGINEERED ALTERNATIVE FINAL COVER PROFILE



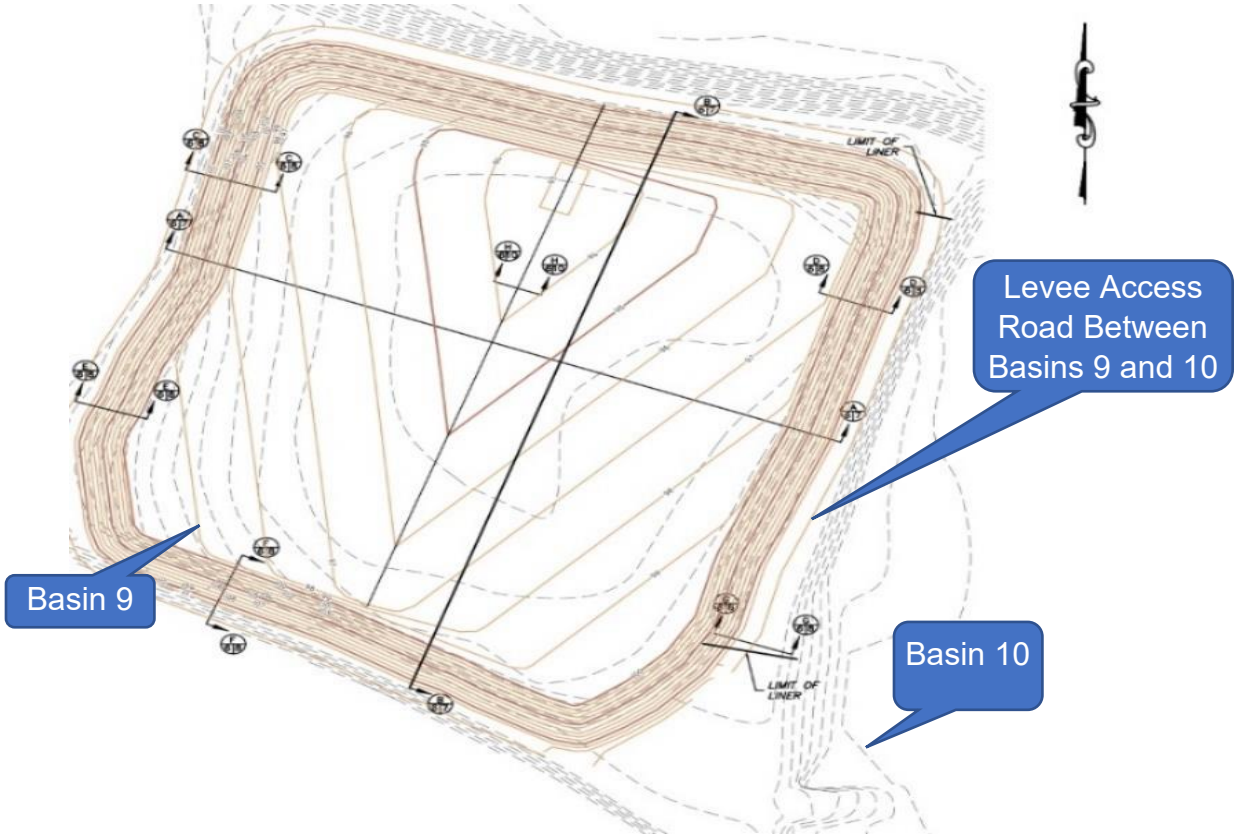
ROWD, 2022 PCP Figure 18, NTS

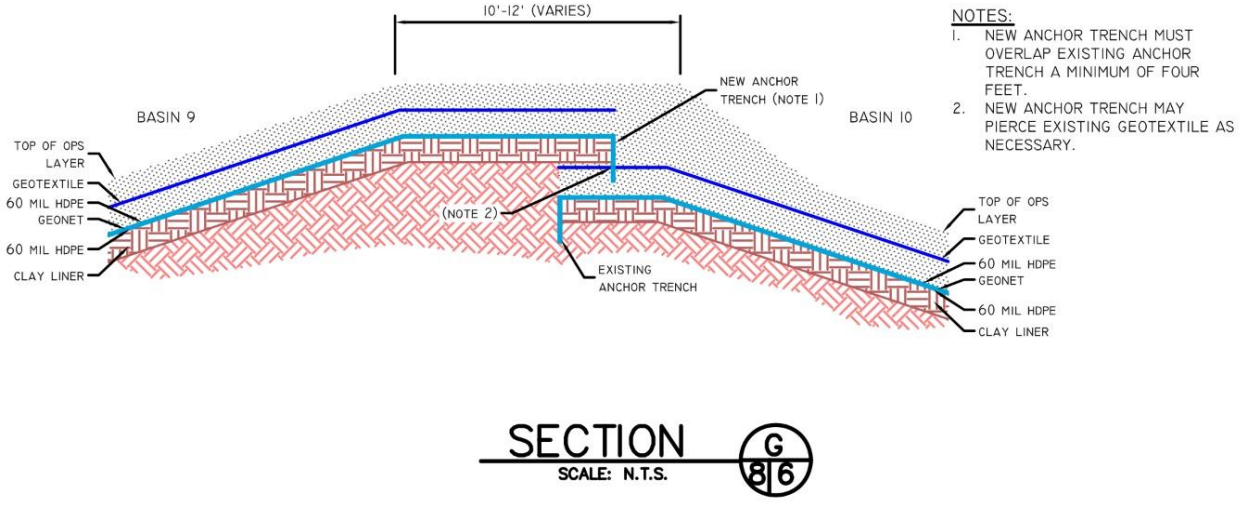
ATTACHMENT H—FINAL WASTE ELEVATIONS



Basin 9 and 10 Final Waste Elevations, ROWD, 2022 PCP Figure 19

ATTACHMENT I—BASIN 9 AND 10 LINER OVERLAP





SECTION G 8|6
SCALE: N.T.S.

Basin 9 Construction Quality Assurance Report, Drawing 6 and 8, February 2013, NTS

STANDARD PROVISIONS & REPORTING REQUIREMENTS

Non-Hazardous Discharges of Waste Regulated under Subtitle D and/or Title 27, December 2015 Edition

A. Applicability

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to nonhazardous solid waste disposal sites that are regulated by the Central Valley Regional Water Quality Control Board (hereafter, Central Valley Water Board) pursuant to the provisions of California Code of Regulations, Title 27 ("Title 27"), section 20005 et seq., and municipal solid waste (MSW) landfills that are subject to the Federal Subtitle D regulations contained in 40 Code of Federal Regulations section 258 (hereafter, "Subtitle D" or "40 C.F.R. § 258.XX") in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62. The Subtitle D regulations are only applicable to MSW landfills and therefore any requirements in these SPRRs that are referenced as coming from Subtitle D are not applicable to non-MSW waste management units such as Class II surface impoundments, Class II waste piles, and non-MSW landfill units. All Subtitle D requirements in these SPRRs are referenced with "[40 C.F.R. § 258.XX]" after the requirement.

2. "Order," as used throughout this document, means the Waste Discharge Requirements (WDRs) to which these SPRRs are incorporated.

3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, and do not protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.

4. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.

5. If there is any conflicting or contradictory language between the WDRs, the Monitoring and Reporting Program (MRP), or the SPRRs, then language in the WDRs shall govern over either the MRP or the SPRRs, and language in the MRP shall govern over the SPRRs.

6. If there is a site-specific need to change a requirement in these SPRRs for a particular landfill facility, the altered requirement shall be placed in the appropriate section of the WDRs and will supersede the corresponding SPRRs requirement. These SPRRs are standard and cannot be changed as part of the permit writing process or in response to comments, but they will be periodically updated on an as-needed basis.

7. Unless otherwise stated, all terms are as defined in Water Code section 13050 and in Title 27, section 20164.

B. Terms and Conditions

1. Failure to comply with any waste discharge requirement, monitoring and reporting requirement, or Standard Provisions and Reporting Requirement, or other order or prohibition issued, reissued, or amended by the Central Valley Water Board or the State Water Board, or intentionally or negligently discharging waste, or causing or permitting waste to be deposited where it is discharged into the waters of the state and creates a condition of pollution or nuisance, is a violation of this Order and the Water Code, which can result in the imposition of civil monetary liability [Wat. Code, § 13350(a)]

2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [Wat. Code, § 13381]:

   a. Violation of any term or condition contained in this Order;

   b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;

   c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or

   d. A material change in the character, location, or volume of discharge.

3. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge (ROWD), or other appropriate joint technical document (JTD), with the Central Valley Water Board [Wat. Code, § 13260(c) and § 13264(a)]. 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.

4. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [Wat. Code, §13267(c)].

5. The Central Valley Water Board will review this Order periodically and will revise these waste discharge requirements when necessary [Wat. Code, § 13263(e) and Title 27, § 21720(b)].

6. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board [Wat. Code, § 13267(b)]. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

7. A discharge of waste into the waters of the state is a privilege, not a right. No discharge of waste into waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right to continue the discharge [Wat. Code, § 13263(g)].

8. Technical and monitoring reports specified in this Order are requested pursuant to the Water Code [§13267(b)]. Failure to furnish the reports by the specified deadlines or falsifying information in the reports, are misdemeanors that may be liable civilly in accordance with §13268(b) of the Water Code [Wat. Code, §13268(a)].

C. Standard Prohibitions

1. The discharge of liquid or semi-solid waste (waste containing less than 50 percent solids) is prohibited, except for the following when proposed in the ROWD/JTD and approved by this Order:

a. Dewatered sewage or water treatment sludge as described in Title 27, section 20220(c) provided it is discharged above a

composite liner with a leachate collection and removal system (LCRS) [Title 27, § 20200(d)(3)].

b. Leachate and/or landfill gas condensate that is returned to the composite- lined waste management unit (with an LCRS) from which it came [Title 27, § 20340(g) and 40 C.F.R. § 258.28].

2. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the waste management unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which, in turn:

   a. require a higher level of containment than provided by the unit; or

   b. are ‘restricted wastes’; or

   c. impair the integrity of containment structures; is prohibited [Title 27, § 20200(b)].

3. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.

4. The discharge of solid waste containing free liquid or which may contain liquid in excess of the moisture holding capacity as a result of waste management operations, compaction or settlement is prohibited.

5. The discharge of waste to a closed landfill unit is prohibited.

6. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited.

7. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

D. Standard Discharge Specifications

1. The Discharger is responsible for accurate characterization of wastes, including a determination of whether or not wastes will be compatible with containment features and other wastes at the waste management unit and whether or not the wastes are required to be managed as a hazardous waste [Title 27, § 20200(c)] or designated waste [Title 27, § 20210].

2. Leachate and landfill gas condensate collected from a waste management unit shall be discharged to the unit from which it came, or discharged to an appropriate waste management unit in accordance with Title 27 and in a manner consistent with the waste classification of the liquid [Title 27, § 20200(d) and § 20340(g)].

3. The discharge of leachate or landfill gas condensate is restricted to those portions of a waste management unit that has a composite liner system and LCRS meeting the Federal Subtitle D requirements [40 C.F.R. § 258.28].

4. Leachate and condensate returned to a composite-lined landfill unit (when approved by this Order) shall be discharged and managed such that it does not cause instability of the waste, does not cause leachate seeps, does not generate additional landfill gas that is not extracted from the landfill by an active landfill gas extraction system, does not cause contaminants to enter surface water runoff, and does not cause leachate volumes to exceed the maximum capacity of the LCRS.

5. Any discharge of waste outside the portion of the landfill that was already covered with waste as of the landfill unit's respective Federal Deadline constitutes a "lateral expansion" and requires the installation of an approved composite liner system and LCRS [40 C.F.R. § 258.40(b)].

6. Wastes shall be discharged only into waste management units specifically designed for their containment and/or treatment, as described in this Order.

7. The discharge shall remain within the designated disposal area at all times.

8. The discharge of waste shall not cause a nuisance condition [Wat. Code, § 13050(m)].

E. Standard Facility Specifications

1. All waste management units shall be designed, constructed, and operated to ensure that wastes, including leachate, will be a minimum of 5 feet above the highest anticipated elevation of underlying groundwater [Title 27, § 20240(c)], including the capillary fringe.

2. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].

3. Interim cover is daily and intermediate cover [Title 27, § 20750(a)]. Interim cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of liquids through the wastes [Title 27, § 20705(b)].

4. Intermediate cover consisting of compacted earthen material of at least twelve (12) inches shall be placed on all surfaces of the fill where no additional solid waste will be deposited within **180 days** [Title 27, § 20700(a)].

5. During wet weather conditions, the facility shall be operated and graded to minimize leachate generation.

6. The Discharger shall immediately notify the Central Valley Water Board staff of any slope failure occurring at a waste management unit. Any failure which threatens the integrity of containment features or the waste management unit shall be promptly corrected in accordance with an approved method [Title 27, § 21710(c)(2)].

7. The Discharger shall **immediately** notify Central Valley Water Board staff of any flooding, unpermitted discharge of waste off-site or outside of waste management units, equipment failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

8. The Discharger shall limit water used for facility maintenance within landfill areas to the minimum amount necessary for dust control and construction.

9. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

10. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.

11. The Discharger shall ensure that methane and other landfill gases are adequately vented, removed from landfill units, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions,

degradation, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.

12. The Discharger shall maintain the depth of the fluid in the sump of each landfill unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).

13. The depth of fluid on the landfill liner shall not exceed **30 centimeters** (cm) [40 C.F.R. § 258.40(a)(2)]. This regulation is interpreted by the Central Valley Water Board to exclude the leachate sump. The Discharger shall **immediately** notify the Central Valley Water Board staff by telephone, and follow up in writing within **seven** days if monitoring reveals that the depth of fluid on any portion of the liner (excluding the sump) exceeds 30 cm (approximately 12 inches). The written notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

14. Each 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 [Title 27, § 20340(d)].

15. The Discharger shall maintain a *Storm Water Pollution Prevention* Plan and *Monitoring Program and Reporting Requirements* in accordance with State Water Board Order No. 2014-0057-DWQ (Industrial General Permit) or most recent general industrial storm water permit), or retain all storm water on-site.

16. Internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.

17. New MSW landfill units or lateral expansions of existing units shall not be sited in a “wetland” [as defined in 40 C.F.R. § 232.29(r)] unless there is no practical alternative; steps have been taken to assure no net loss of wetland; the landfill unit will not degrade the wetland; the unit will not jeopardize threatened or endangered species or produce adverse modification of a critical habitat or violate any requirement of the Marine Protection, Research, and Sanctuaries Act of 1972 [40 C.F.R. § 258.12].

F. Standard Construction Specifications

1. The Discharger shall submit for review and approval at least 90 days prior to proposed construction, design plans and specifications for new landfill modules that include the following:

   a. Detailed construction drawings showing all required liner system components, the LCRS, leachate sump, unsaturated zone monitoring system, any proposed landfill gas monitoring and extraction points, and access to the LCRS for required annual testing.

   b. A Construction Quality Assurance (CQA) Plan prepared by a California-registered civil engineer or certified engineering geologist, and that meets the requirements of Title 27, section 20324.

   c. A geotechnical evaluation of the area soils, evaluating their use as the base layer or reference to the location of this information in the ROWD/JTD [Title 27, § 21750(f)(4)].

   d. Information about the seismic design of the proposed new module (or reference to the location of this information in the ROWD/JTD) in accordance with Title 27, section 20370.

   e. A revised water quality monitoring plan for groundwater detection monitoring (or information showing the existing plan is adequate) in accordance with Title 27, section 20415.

   f. An Operation Plan (or reference to the location of this information in the ROWD/JTD) meeting the requirements of Title 27, section 21760(b).

2. All containment structures shall be designed by, and construction shall be supervised by, a California registered civil engineer or a certified engineering geologist, and shall be certified by that individual as meeting the prescriptive standards, or approved engineered alternative design, in accordance with this Order prior to waste discharge.

3. The Discharger shall not proceed with construction until the construction plans, specifications, and all applicable construction quality assurance plans have been approved. Waste management units shall receive a final

inspection and approval of the construction by Central Valley Water Board staff before use of the unit commences [Title 27, § 20310(e)].

4. Any report, or any amendment or revision of a report, that proposes a design or design change that might affect a waste management unit's containment features or monitoring systems shall be approved by a California registered civil engineer or a certified engineering geologist [Title 27, § 21710(d)].

5. Materials used in containment structures shall have appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of pressure gradients, physical contact with waste or leachate, chemical reactions with soil or rock, climatic conditions, the stress of installation, or because of the stress of daily operations [Title 27, § 20320(a)].

6. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping [Title 27, § 20365(a)].

7. The Discharger shall design storm water conveyance systems for Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

8. All Class III landfill units shall be designed to withstand the maximum probable earthquake and Class II waste management units shall be designed to withstand maximum credible earthquake without damage to the foundation or to the structures that control leachate, or surface drainage, or erosion, or gas [Title 27, § 20370(a)].

9. The Discharger shall perform stability analyses that include components to demonstrate the integrity of the landfill foundation, final slopes, and containment systems under both static and dynamic conditions throughout the landfill's life including the closure period and post-closure maintenance period [Title 27, § 21750(f)(5)].

10. New waste management units and expansions of existing units shall not be located on a known Holocene fault [Title 27, § 20260(d)].

11. Liners shall be designed and constructed to contain the fluid, including landfill gas, waste, and leachate [Title 27, § 20330(a)].

12. Hydraulic conductivities shall be determined primarily by appropriate field test methods in accordance with accepted civil engineering practice. The results of laboratory tests with both water and leachate, and field tests with water, shall be compared to evaluate how the field permeabilities will be affected by leachate. It is acceptable for the Discharger to use appropriate compaction tests in conjunction with laboratory hydraulic conductivity tests to determine field permeabilities as long as a reasonable number of field hydraulic conductivity tests are also conducted [Title 27, § 20320(c)].

13. Hydraulic conductivities specified for containment structures other than the final cover shall be relative to the fluids (leachate) to be contained. Hydraulic conductivities for the final cover shall be relative to water [Title 27, § 20320(b)].

14. A test pad for each barrier layer and final cover shall be constructed in a manner duplicating the field construction. Test pad construction methods, with the designated equipment, shall be used to determine if the specified density/moisture-content/hydraulic conductivity relationships determined in the laboratory can be achieved in the field with the compaction equipment to be used and at the specified lift thickness [Title 27, § 20324(g)(1)(A)].

15. Performance requirements for geosynthetic membranes shall include, but are not limited to, a need to limit infiltration of water, to the greatest extent possible; a need to control landfill gas emissions; mechanical compatibility with stresses caused by equipment traffic, and for final covers the result of differential settlement over time and durability throughout the post-closure maintenance period [Title 27, § 20324(i)(1)].

16. The Discharger shall ensure proper preparation of the subgrade for any liner system that includes a GCL so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.

17. The Discharger shall propose an electronic leak location survey of the top liner for any new landfill module in the construction quality assurance plan unless the Discharger demonstrates that a leak location survey is not needed.

18. Leachate collection and removal systems are required for Class II landfills and surface impoundments, MSW landfills, and for Class III landfills which have a liner or which accept sewage or water treatment sludge [Title 27, § 20340(a)].

19. All new landfill units or lateral expansions of existing units that require a LCRS shall have a blanket-type LCRS that covers the bottom of the unit and extends as far up the sides as possible. The LCRS shall be of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the unit [Title 27, § 20340(e)].

20. The LCRS shall be designed, constructed, maintained, and operated to collect and remove twice the maximum anticipated daily volume of leachate from the waste management unit [Title 27, § 20340(b)].

21. Leachate collection and removal systems shall be designed and operated to function without clogging through the scheduled closure of the landfill unit and during the post-closure maintenance period.

22. The LCRS shall be designed to maintain the depth of fluid over any portion of the LCRS of no greater than 30 cm [40 C.F.R. § 258.40(a)(2)], excluding the leachate sump. The leachate sump, leachate removal pump, and pump controls shall be designed and set to maintain a fluid depth no greater than the minimum needed for efficient pump operation [Title 27, § 20340(c)].

23. All construction of liner systems and final cover systems shall be performed in accordance with a Construction Quality Assurance Plan certified by a registered civil engineer or a certified engineering geologist [Title 27, § 20323].

24. The Construction Quality Assurance program shall be supervised by a registered civil engineer or a certified engineering geologist who shall be designated the CQA officer [Title 27, § 20324(b)(2)].

25. The Discharger shall ensure that a third party independent of both the Discharger and the construction contractor performs all of the construction quality assurance monitoring and testing during the construction of a liner system.

26. The Discharger shall notify Central Valley Water Board staff at least **14 days** prior to commencing field construction activities including construction of a new lined cell or module, construction of a final cover, or any other construction that requires Central Valley Water Board staff approval under this Order.

27. The Discharger shall submit for review and approval at least **60 days** prior to proposed discharge, final documentation required in Title 27 Section 20324(d)(1)(C) following the completion of construction of a new lined landfill module. The report shall be certified by a registered civil engineer or a certified engineering geologist and include a statement that the liner system was constructed in accordance with the approved design plans and specifications, the CQA Plan, the requirements of the WDRs, and that it meets the performance goals of Title 27. The report shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, the construction quality assurance plan, and the performance goals of Title 27.

28. The Discharger shall not discharge waste onto a newly constructed liner system until the final documentation report has been reviewed and an acceptance letter has been received.

29. Prior to placement of waste in a new landfill unit, the Discharger shall monitor any pan lysimeter for the unit that has received enough rainfall to flood the LCRS sump. If liquid is detected in the pan lysimeter, the Discharger shall verify that the liquid is not from a leak in the primary liner system before waste can be accepted to the new module.

G. Standard Closure and Post-Closure Specifications

1. The Discharger shall submit a final or partial final closure and post-closure maintenance plan at least **two years** prior to the anticipated date of closure [Title 27, § 21780(d)(1)].

2. The Discharger shall notify the Central Valley Water Board in writing that a landfill unit or portion of a unit is to be closed either at the same time that the California Department of Resources Recycling and Recovery (CalRecycle) is notified or **180 days** prior to beginning any final closure activities, whichever is sooner [Title 27, § 21710(c)(5)(A)]. The notice shall include a statement that all closure activities will conform to the most recently approved final or partial final closure plan and that the plan provides for site closure in compliance with all applicable federal and state regulations [Title 27, § 21710(c)(5)(C)].

3. Initiation of closure activities shall begin within **30 days** of final waste receipt, or within one year of receipt of most recent waste if additional capacity remains [40 C.F.R. § 258.60(f)].

4. Closure activities shall be completed within **180 days** of the beginning of closure activities unless an extension is granted by the Central Valley Water Board [40 C.F.R. § 258.60(g)].

5. The Discharger shall carry out both mandatory closure and normal closure of a waste management unit or a portion of a unit in accordance with a closure and post-closure maintenance plan approved by the Central Valley Water Board [Title 27, § 20950(a)(1)] through the issuance of closure waste discharge requirements.

6. The Discharger shall notify the Central Valley Water Board that a preliminary closure and post-closure maintenance plan has been prepared and placed in the operating record by the date of initial receipt of waste at any new MSW landfill unit or lateral expansion of any existing unit [40 C.F.R. § 258.60(d)]. This notification shall be included in the cover letter transmitting the preliminary closure and post-closure maintenance plan.

7. In addition to the applicable provisions of Title 27, the preliminary closure and/or the post-closure maintenance plans for MSW landfill units shall include the following:

    a. A description of the steps necessary to close all MSW landfill units at any point during their active life in accordance with the cover design requirements [40 C.F.R. § 258.60(c)];

    b. An estimate of the largest area of the landfill unit(s) ever requiring a final cover at any time during the active life of the unit(s) [40 C.F.R. § 258.60(c)(2)];

    c. An estimate of the maximum inventory of wastes ever on-site over the active life of the waste management facility [40 C.F.R. § 258.60(c)(3)]; and

    d. A schedule for completing all activities necessary to satisfy the closure criteria in 40 C.F.R. section 258.60 [40 C.F.R. § 258.60(c)(4)].

8. The final closure and post-closure maintenance plan for the waste management unit shall include at least the following: an itemized cost analysis, closure schedule, any proposed final treatment procedures, map, changes to the unit description presented in the most recent ROWD, federal requirements for a MSW facility, land use of the closed unit, and a construction quality assurance plan [Title 27, § 21769(c) & (d)].

9. Closure of each waste management unit shall be under the direct supervision of a registered civil engineer or certified engineering geologist [Title 27, § 20950(b)].

10. The final cover of closed landfills shall be designed, graded, and maintained to prevent ponding and soil erosion due to high run-off velocities [Title 27, § 21090(b)(1)(A)].

11. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist [Title 27, § 21090(b)(1)(C)].

12. All final cover designs shall include a minimum 1-foot thick erosion resistant layer [Title 27, § 21090(a)(3)(A)].

13. The Discharger shall close the landfill with minimum 15-foot wide benches every 50 vertical feet [Title 27, § 21090(a)].

14. Final cover slopes shall not be steeper than a horizontal to vertical ratio of one and three quarters to one and designs having any slopes steeper than a horizontal to vertical ratio of three to one, or having a geosynthetic component, shall have these aspects of their design specifically supported in the slope stability report required in Title 27, section 21750(f)(5) [Title 27, § 21090(a)].

15. For any portions of the final cover installed after July 18, 1997, for which the Central Valley Water Board has not approved a slope and foundation stability report on or before that date, the Discharger shall meet the requirements of Title 27, section 21750(f)(5) [Title 27, § 21090(a)(6)].

16. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion [Title 27, § 21090(b)(2)].

17. The Discharger shall design storm water conveyance systems for closed Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for closed Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

18. Closed landfill units shall be provided with at least two permanent surveying monuments, installed by a licensed land surveyor or by a registered civil engineer, from which the location and elevation of all wastes, containment structures, and monitoring facilities can be

determined throughout the post-closure maintenance period [Title 27, § 20950(d)].

19. Following closure of any MSW landfill units, the Discharger shall notify the Central Valley Water Board that the deed to the landfill facility property, or some other instrument that is normally examined during a title search, has been recorded and a copy placed in the operating record. The notation on the deed shall in perpetuity notify any potential purchaser of the property that the land has been used as a landfill facility and that use of the land is restricted to the planned use described in the post-closure maintenance plan [Title 27, § 20515(a)(4) and §21170, and 40 C.F.R. § 258.60(i)].

20. Construction or repair of the final cover system's low-hydraulic conductivity layer is to be carried out in accordance with an approved construction quality assurance plan [Title 27, § 21090(b)(1)(E)].

21. The Discharger shall incorporate into the closure and post-closure maintenance plan a cover-integrity monitoring and maintenance program which includes at least the following: a periodic leak search, periodic identification of other problem areas, prompt cover repair, and vegetation maintenance [Title 27, § 21090(a)(4)].

22. The Discharger shall complete a final cover survey upon completion of closure activities for that portion of the landfill. The final cover surveys shall include an initial survey and map [Title 27, § 21090(e)(1). **Every five years**, the Discharger shall conduct a survey of the closed landfill cover and submit an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic-conductivity layer [Title 27, § 21090(e)(2)].

23. Within **30 days** of completion of all closure activities, the Discharger shall certify that all closure activities were performed in accordance with the most recently approved final closure plan and CQA Plan, and in accordance with all applicable regulations. The Discharger shall also certify that closed landfill units shall be maintained in accordance with and approved post-closure maintenance plan [Title 27, § 21710(c)(6)].

24. Within **180 days** of completion of closure construction activities, the Discharger shall submit final documentation of closure, including the Certification of Closure. The closure documents shall include a final construction quality assurance report and any other documents necessary to support the certification [Title 27, § 21880].

25. The post-closure maintenance period shall continue until the Central Valley Water Board determines that wastes remaining in the landfill unit(s) no longer pose a threat to water quality [Title 27, § 20950(a)(1)].

26. The Discharger shall conduct a periodic leak search to monitor of the integrity of the final cover in accordance with the schedule in the approved final post- closure maintenance plan [Title 27, § 21090(a)(4)(A)].

27. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, areas damaged by equipment operations, and localized areas identified in the required five-year iso-settlement survey [Title 27, § 21090(a)(4)(B)].

28. The Discharger shall repair the cover promptly in accordance with a cover repair plan to be included in the final post-closure maintenance plan [Title 27, § 21090(a)(4)(C)].

29. Throughout the post-closure maintenance period, the Discharger shall maintain the structural integrity and effectiveness of all containment structures, maintain the final cover as necessary to correct the effects of settlement and other adverse factors, continue to operate the LCRS as long as leachate is generated and detected, maintain the monitoring systems, prevent erosion and related damage of the final cover due to drainage, and protect and maintain surveyed monuments [Title 27, § 21090(c)].

30. Post-closure maintenance shall be conducted for a minimum period of 30 years or until the waste no longer poses a threat to environmental quality, whichever is greater [Title 27, § 21180(a) and Title 27, § 21900(a)].

H. Standard Financial Assurance Provisions

1. The Discharger shall establish an irrevocable fund for closure and post-closure maintenance to ensure closure and post-closure maintenance of each classified unit in accordance with an approved closure and post-closure maintenance plan [Title 27, § 20950(f) and § 22207(a)].

2. The Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known and reasonably foreseeable releases from the waste management unit [Title 27, §20380(b), § 22221, and § 22222].

I. Standard Monitoring Specifications

1. The water quality monitoring program shall include appropriate and consistent sampling and analytical procedures and methods designed to ensure that monitoring results provide a reliable indication of water quality at all monitoring points and background monitoring points [Title 27, § 20415(e)(4) and 40 C.F.R. § 258.53(b)].

2. All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer [Title 27, § 20415(e)(1)].

3. All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well bore hole and prevents the bore hole from acting as a conduit for contaminant transport [Title 27, § 20415(b)(4)(A)].

4. All sample chemical analyses of any material shall be performed by a laboratory certified by the California Department of Health Services [Wat. Code, § 13176(a)].

5. A Detection Monitoring Program for a new landfill facility shall be installed, operational, and one year of monitoring data collected from background monitoring points prior to the discharge of wastes [Title 27, § 20415(e)(6)].

6. Background for water samples or soil-pore gas samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point).

7. The Discharger shall submit for approval, establish, and maintain an approved Sample Collection and Analysis Plan. The Sample Collection and Analysis Plan shall at a minimum include:

   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.

If required by the Central Valley Water Board, the Discharger shall modify the Sample Collection and Analysis Plan to conform with this Order.

8. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless a longer time period is approved, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan. Appropriate sample preparation techniques shall be used to minimize matrix interferences.

9. If methods other than USEPA-approved methods or Standard Methods are used, or there is a proposed alternant USEPA method than the one listed in the MRP, the proposed methodology shall be submitted for review and approval prior to use, including information showing its equivalence to the required method.

10. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., “trace” or “ND”) in data from background monitoring points for that medium, the analytical method having the lowest MDL shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.

11. The laboratory reporting limit (RL) for all reported monitoring data shall be set no greater than the practical quantitation limit (PQL).

12. **"Trace" results** - results falling between the MDL and the PQL - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.

13. Laboratory data shall not be altered or revised by the Discharger. If the Discharger observes potential lab errors, it shall identify the issue in the monitoring report and shall describe steps that will be taken to prevent similar errors in the future.

14. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs. MDLs and PQLs shall be reported.

15. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged in the laboratory report accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result**. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.

16. All **QA/QC** data shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and signature of a responsible person from the laboratory. **Sample results shall be reported unadjusted for blank results or spike recoveries**. 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.

17. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.

18. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples [Title 27, § 20415(b)(4)(B)]. Groundwater samples shall not be field-filtered prior to laboratory analysis [40 C.F.R. § 258.53(b)]. Groundwater samples needing filtering (e.g., samples to be analyzed for dissolved metals) shall be filtered by the laboratory prior to analysis.

19. Groundwater elevations shall be measured in each well immediately prior to purging, each time groundwater is sampled. The owner or operator shall determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same waste management area shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction [40 C.F.R. § 258.53(d)].

20. Monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program [40 C.F.R. § 258.51(c)(2)]. Monitoring devices that cannot be operated and maintained to perform to design specifications shall be replaced after review and approval of a report (i.e., work plan) for the proposed replacement devices.

21. All borings are to be logged during drilling under the direct supervision of a registered geologist or registered civil engineer with expertise in stratigraphic well logging [Title 27, § 20415(e)(2)].

22. Soils are to be described according to the Unified Soil Classification System [Title 27, § 20415(e)(2)(A)]. Rock is to be described in a manner appropriate for the purpose of the investigation [Title 27, § 20415(e)(2)(B)].

23. The Discharger shall submit a work plan for review and approval at least **60 days** prior to installation or abandonment of groundwater monitoring wells.

24. The Discharger shall provide Central Valley Water Board staff a minimum of **one-week** notification prior to commencing any field activities related to the installation or abandonment of monitoring devices.

25. The water quality protection standard shall consist of the constituents of concern (COC), concentration limits, and the point of compliance. The water quality protection standard shall apply during the active life of the waste management unit, closure period, post-closure maintenance period, and any compliance period under Title 27, section 20410 [Title 27, § 20390].

26. The point of compliance at which the water quality protection standard applies is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit [Title 27, § 20405).

27. The compliance period is the minimum period of time during which the Discharger shall conduct a water quality monitoring program and is the number of years equal to the active life of the waste management unit plus the closure period [Title 27, § 20410(a)].

28. The groundwater monitoring system shall include a sufficient number of monitoring points, installed at appropriate locations, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the waste management unit [Title 27, § 20415(b)(1)(A)].

29. The Detection Monitoring Program shall include a sufficient number of monitoring points, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance to allow the detection of a release from the waste management unit [Title 27, § 20415(b)(1)(B)1.].

30. Additional monitoring points shall be added as necessary to provide the best assurance of the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)2.].

31. The Detection Monitoring Program shall also include a sufficient number of monitoring points installed at appropriate depths and locations to yield groundwater samples from other aquifers or perched zones not already monitored to provide the earliest possible detection of a release from the waste management unit [Title 27, § 20415(b)(1)(B)3. and 4., and §20420(b)].

32. A surface water monitoring system shall be established to monitor each surface water body that could be affected by a release from the waste management unit [Title 27, § 20415(c)].

33. An unsaturated zone monitoring system shall be established for each waste management unit [Title 27, § 20415(d)].

34. The Discharger shall notify Central Valley Water Board staff within **seven days** if fluid is detected in a previously dry LCRS, unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a LCRS [Title 27, § 21710(c)(3)].

35. Driller's logs for all monitoring wells shall to be submitted to the Central Valley Water Board and the Department of Water Resources [Wat. Code, § 13751 and Title 27, § 20415(b)(3)].

36. Groundwater elevation, temperature, electrical conductivity, turbidity, and pH are to be accurately measured at each well each time groundwater is sampled [Title 27, § 21415(e)(13)].

37. The groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation being monitored shall be determined at least quarterly [Title 27, § 20415(e)(15)].

38. The Discharger shall graph all analytical data from each monitoring point and background monitoring point and shall submit the graphs to the Central Valley Water Board annually [Title 27, § 20415(e)(14)].

39. For each waste management unit, the Discharger shall collect all data necessary for selecting appropriate data analysis methods for establishing background values for each constituent of concern and for each monitoring parameter [Title 27, § 20420(c)]. The Discharger shall propose a data analysis method that includes a detailed description of the criteria to be used for determining "measurably significant" (as defined in Title 27, section 20164) evidence of a release from the waste management unit

and determining compliance with the water quality protection standard [Title 27, § 20415(e)(6) and (7)].

40. For statistical analysis of data, the Discharger shall use one of the methods described in Title 27, section 20415(e)(8)(A)-(E). A non-statistical data analysis method can be used if the method can achieve the goal of the particular monitoring program at least as well as the most appropriate statistical method [Title 27, § 20415(e)(8)]. The Discharger shall use a statistical or nonstatistical data analysis method that complies with Title 27, section 20415(e)(7, 8, 9, and 10), to compare the concentration of each constituent of concern or monitoring parameter with its respective background concentration to determine whether there has been a measurably significant evidence of a release from the waste management unit. For any given monitoring point at which a given constituent has already exhibited a measurably significant indication of a release at that monitoring point, the Discharger may propose to monitor the constituent, at that well, using a concentration-versus-time plot.

41. The Discharger may propose an alternate statistical method [to the methods listed under Title 27, section 20415(e)(8)(A-D)] in accordance with Title 27, section 20415(e)(8)(E), for review and approval.

42. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27, section 20415(e)(7) that is used in the statistical method shall be the **lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs or an approved Sample Collection and Analysis Plan for routine laboratory operating conditions that are available to the facility. The Discharger's technical report (Sample Collection and Analysis Plan and/or Water Quality Protection Standard Report), pursuant to Title 27, section 20415(e)(7), shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or non-statistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration

estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of “ties”.

43. The water quality protection standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (e.g., USEPA methods 8260 and 8270).

44. Alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate) if part of an approved water quality protection standard. Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Central Valley Water Board staff.

45. **Confirmation of Measurably Significant Evidence of a Release.** Whenever a constituent is detected at a detection monitoring point at a concentration that exceeds the concentration limit from the water quality protection standard, the Discharger shall conduct verification sampling to confirm if the exceedance is due to a release or if it is a false-positive (unless previous monitoring has already confirmed a release for that constituent at that monitoring point). An exceedance of the concentration limit from the water quality protection standard is considered measurably significant evidence of a release that must be either confirmed or denied. There are two separate verification testing procedures:

    a. Standard Monitoring Specification I.46 provides the procedure for analytes that are detected in less than 10% of the background samples such as non- naturally occurring constituents like volatile organic compounds; and

    b. Standard Monitoring Specification I.47 provides the procedure for analytes that are detected in 10% or greater of the background samples such as naturally occurring constituents like chloride.

46. **Verification Procedure for Analytes Detected in Less than 10% of Background Samples.** The Discharger shall use the following non-statistical method for all analytes that are detected in less than 10% of the background samples. The non-statistical method shall be implemented as follows:

a. **Initial Determination of Measurably Significant Evidence of a Release.** Identify each analyte in the current detection monitoring point sample that exceeds either its respective MDL or PQL, and for which a release has not been previously confirmed. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if ***either***:

i. The data contains two or more analytes that equal or exceed their respective MDLs; or

ii. The data contains one or more analyte that equals or exceeds its PQL.

b. **Discrete Retest** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)]:

i. In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.46.a., above) that there is a preliminary indication of a release, then the Discharger shall immediately notify Central Valley Water Board staff by phone or e-mail and, within 30 days of such indication, shall collect two new (retest) samples from the monitoring point where the release is preliminarily indicated and analyze them for the constituents that caused the need for the retest.

ii. **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall conclude that measurably significant evidence of a release is confirmed if (not including the original sample) two or more analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL. The Discharger shall then:

(A) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail within seven days of the verbal notification; and

(B) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.

(C) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

47. **Verification Procedure for Analytes Detected in 10% or Greater of the Background Samples.** The Discharger shall use either a statistical or non-statistical method pursuant to Title 27, section 20415(e)(8)(E) for all analytes that are detected in 10% or greater of the background samples. The Discharger shall use one of the statistical methods required in Title 27, section 20415(e)(8)(E) unless another method has been proposed by the Discharger in a Water Quality Protection Standard Report (or equivalent report) and approved by the Central Valley Water Board in a Monitoring and Reporting Program pursuant to Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E). The method shall be implemented as follows:

a. **Initial Determination of Measurably Significant Evidence of a Release.** The Discharger shall compare the value reported by the laboratory for each analyte to the statistically-derived concentration limit from the most recent report (Annual Monitoring Report or Water Quality Protection Standard Report) that uses the approved statistical procedure. If the value exceeds the concentration limit for that constituent, the Discharger shall conclude that there in measurably significant evidence of a release [Title 27, § 20420(i)].

b. **Retest Method** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)].

i. In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.47.a., above) that there is a preliminary indication of a release, then the Discharger shall immediately notify Central Valley Water Board staff by phone or e-mail and, within 30 days [Title 27, § 20415(e)(3)] of such indication, the Discharger shall implement a verification procedure/retest option, in accordance with Title 27, sections 20415(e)(8)(E) and 20420(j)(2). The verification procedure shall include either a single “composite” retest (i.e., a statistical analysis that augments and reanalyzes the data from the monitoring point

that indicated a release) or shall consist of 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(e)(8)(E)]. The Discharger may use an alternate method previously approved by the Central Valley Water Board and included in the Monitoring and Reporting Program. The verification procedure shall comply with the requirements of Title 27, section 20415(e)(8)(E) in addition to the performance standards of Title 27, section 20415(e)(9). 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. For any indicated monitoring parameter or constituent of concern, if the retest results of one or more of the retest data suites confirm the original indication, the Discharger shall conclude that measurably significant evidence of a release has been confirmed.

ii. **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall evaluate the results pursuant to paragraph I.47.b.1, above and shall:

(A) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail within seven days of the verbal notification; and

(B) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.

(C) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

48. **Physical Evidence of a Release.** If the Discharger determines that there is a significant physical evidence of a release, the Discharger shall immediately verbally notify Central Valley Water Board staff and provide

written notification by certified mail within 7 days of such determination, and within 90 days shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program [Title 27, § 20385(a)(3) and § 20420(l)(1) & (2)].

J. Response to Release

1. Measurably Significant Evidence of a Release Has Been Confirmed. If the Discharger has confirmed that there is measurably significant evidence of a release from a waste management unit pursuant to Standard Monitoring Specification I.46 or I.47, then the Discharger shall:

   a. **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 constituent of concern scan does not involve statistical testing, the Discharger will need to collect and analyze only a single water sample from each monitoring point in the affected medium [Title 27, § 20420(k)(1)].

   b. **Within 14 days** of confirming measurably significant evidence of a release, the Discharger shall (for releases from MSW landfill units) notify all persons who own the land or reside on the land that directly overlies any portion of the plume of contamination if contaminants have migrated off-site if indicated by sampling of detection monitoring wells [40 C.F.R. § 258.55(g)(1)(iii)].

   c. **Within 90 days** of confirming measurably significant evidence of a release, the Discharger shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program meeting the requirements of Title 27, sections 20420(k)(5)(A-D), including but not limited to the results of sampling pursuant to paragraph J.1.a, above. 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 [Title 27, § 20420(k)(5) and § 20425(b)]. For releases from 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 well required by 40 C.F.R. § 258.55(g)(1)(ii).

d. **Within 180 days** of confirming measurably significant evidence of a release, the Discharger shall submit to the Central Valley Water Board an initial engineering feasibility study for a Corrective Action Program necessary to meet the requirements of Title 27, section 20430. At a minimum, the initial engineering feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern [Title 27, § 20420(k)(6)].

e. If the Discharger confirms that there is measurably significant evidence of a release from the waste management unit at any monitoring point, the Discharger may attempt to demonstrate that a source other than the waste management unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation or by natural variation in groundwater, surface water, or the unsaturated zone. The Discharger may make a demonstration pursuant to Title 27, section 20420(k)(7) in addition to or in lieu of submitting both an amended report of waste discharge or an engineering feasibility study; however, the Discharger is not relieved of the requirements and due dates of Title 27, sections 20420(k)(6) & (7) unless Central Valley Water Board staff agree that the demonstration successfully shows that a source other than the waste management unit caused the evidence of a release or that the evidence resulted from error in sampling, analysis, or statistical evaluation or from natural variation in groundwater, surface water, or the unsaturated zone. In order to make this demonstration, the Discharger shall notify the Central Valley Water Board by certified mail of the intent to make the demonstration **within seven days** of determining measurably significant evidence of a release, and shall submit a report **within 90 days** of determining measurably significant evidence of a release [Title 27, § 20420(k)(7)].

f. **Within 90 days** of the date that the Evaluation Monitoring Program from paragraph J.1.c is approved (the date is it established), the Discharger shall complete and submit the following:

i. **Results and Assessment for the Evaluation Monitoring Program.** A report with the results and assessment based on the approved Evaluation Monitoring Program [Title 27, § 20425(b)].

ii. **Updated Engineering Feasibility Study.** 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. **Amended ROWD for a Corrective Action Program.** An amended report of waste discharge 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)].

g. 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)].

K. General Provisions

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Central Valley Water Board office by telephone as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

2. All reports and transmittal letters shall be signed by persons identified below:

   a. For a corporation: by a principal executive officer of at least the level of senior vice-president.

   b. For a partnership or sole proprietorship: by a general partner or the proprietor.

   c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.

d. A duly authorized representative of a person designated in a, b or c above if:

i. The authorization is made in writing by a person described in a, b, or c of this provision;

ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and

iii. The written authorization is submitted to the Central Valley Water Board.

e. Any person signing a document under this Section shall make the following certification:

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

3. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.

4. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and post-closure maintenance period of the

waste management units and during subsequent use of the property for other purposes.

5. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of this Order.

6. The Discharger shall notify the Central Valley Water Board of a material change in; the types, quantity, or concentrations of wastes discharged; site operations and features; or proposed closure procedures, including changes in cost estimates. This notification shall be given a reasonable time before the changes are made or become effective. No changes shall be made without Central Valley Water Board approval following authorization for closure pursuant to the site Notification of Closure [Title 27, § 21710(a)(4)].

7. The Discharger shall maintain legible records of the volume and type of each waste discharged at each waste management unit or portion of a unit, and the manner and location of discharge. Such records shall be maintained by the Discharger until the beginning of the post-closure maintenance period. These records shall be on forms approved by the State Water Board or Central Valley Water Board and shall be maintained at the waste management facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the State Water Board or Central Valley Water Board at any time during normal business hours. At the beginning of the post-closure maintenance period, copies of these records shall be sent to the Central Valley Water Board [Title 27, § 21720(f)].

8. In the event of any change in landowner or the operator of the waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Central Valley Water Board.

9. In the event of any change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of the waste discharge facilities described in this Order, the Discharger shall notify the Central Valley Water Board prior to the effective date of the change and shall include a statement by the new Discharger that construction, operation, closure, or post-closure maintenance will be in compliance with this Order and any revisions thereof [Title 27, § 21710(c)(1)].

10. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Central Valley Water Board requesting transfer of the Order within **14 days** of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory requirements contained in General Provision K.2 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer of this Order shall be approved or disapproved by the Central Valley Water Board.

L. Storm Water Provisions

1. New and existing Class III landfills shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period [Title 27, § 20260(c)].

2. New and existing Class II landfills shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period [Title 27, § 20250(c)].

3. The Discharger shall design storm water conveyance systems for Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

4. MSW landfills located in a 100-year floodplain shall demonstrate that the landfill unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health or the environment [40 C.F.R. § 258.11(a)].

5. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions for the unit [Title 27, § 20365(a)].

6. Precipitation on landfills or waste piles which is not diverted by covers or drainage control systems shall be collected and managed through the

LCRS, which shall be designed and constructed to accommodate the precipitation conditions for each class unit [Title 27, § 20365(b)].

7. Diversion and drainage facilities shall be designed, constructed, and maintained to [Title 27, § 20365(c)]:

   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;

   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 facility; and

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

8. 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 [Title 27, § 20365(d)].

9. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].

10. Cover materials shall be graded to divert precipitation from the waste management unit, to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation [Title 27, § 20365(f)].

Any drainage layer in the final cover shall be designed and constructed to intersect with the final drainage system for the waste management unit in a manner promoting free drainage from all portions of the drainage layer [Title 27, §20365(f)]. [paste SPRRs here]

INFORMATION SHEET

Aqua Clear Farms, a California corporation, owns and operates Aqua Clear Farms (Facility) and the affiliated Hatch Investments, a California limited partnership owns the land where the Facility is located, approximately 15.5 miles south of Dixon in Solano County. The 84-Acre Facility consists of multiple operational, planned, and former Class II surface impoundments (referred to herein as "basins"), some of which the Dischargers closed as landfills and others the Dischargers clean closed, pursuant to California Code of Regulations, title 27 (Title 27).

The Dischargers process drilling mud and associated non-hazardous or inert wastes received at the Facility in vacuum trucks or tankers which discharge directly into the basins. The drilling mud solids settle to the bottom of the basins, and the remaining water separates and rests on top of the settled mud ("top water"). During the dry season, the top water evaporates or the Dischargers transfer the top water to another basin and mechanically process the underlying solids with low ground pressure compaction equipment to facilitate further drying.

Drilling Mud

These Waste Discharge Requirements (WDRs) collectively refer to the non-hazardous or inert wastes received at the Facility (described in Findings 8, 9, 10, and 11) as "drilling mud." Drilling mud generally refers to fluids generated in the process of drilling a borehole into the earth, including for the extraction of oil and gas resources. Drilling mud may also include so-called "re-work" drilling mud wastes generated during drilling operations intended to secure, restore, or improve production in completed wells, directional drilling wastes, or hydrovac wastes.

Drilling muds and other associated non-hazardous or inert wastes are typically transported to the Facility in tanker or vacuum trucks in apparent semisolid or solid states which also can contain free liquids. Notwithstanding, dried drilling muds tend to have soil-like physical characteristics due to the materials used to create the drilling mud such as bentonite clay.

"Liquid waste" refers to any waste materials which are not spadable (Title 27, § 20164). For the purposes of these WDRs, separated drilling mud liquids (i.e., "top water") and any other associated drilling mud free liquids are considered a "liquid waste" and the remaining associated drilling mud components are considered "spadable" solids. In the event a dispute arises on whether a substance is a "free liquid" within the meaning of these WDRs, resolution may be determined by performance of the "Paint Filter Liquids Test" (USEPA Method 9095B).

Information Sheet

While these WDRs identify certain prohibited wastes (e.g., "production water" generated by the extraction of oil and gas resources), in all cases these WDRs prohibit the discharge of hazardous wastes. These WDRs also prohibit discharge of drilling muds with pH less than or equal to 2.5 or greater than or equal to 12.0. The Dischargers are responsible for compliance with these requirements. These WDRs further require the Dischargers to implement load inspection and monitoring to verify wastes are not hazardous or otherwise prohibited. The Dischargers may provide documentation from waste generators in lieu of collecting representative samples from vehicles.

Engineering Feasibility Study and Corrective Action

The Dischargers submitted *Engineering Feasibility Study for Corrective Action of Shallow Ground Water Zone, Aqua Clear Farms, Inc., Solano County, California,* dated October 31, 2016 and *Final Report of Findings, Evaluation Monitoring Program/Site Investigation, Aqua Clear Farms, Inc., Solano County, California*, dated July 29 2016 and an update submitted December 30, 2022 wherein the Dischargers recommended additions to the corrective action groundwater extraction system.

The revised proposed corrective action groundwater extraction system would consist of five groundwater extraction wells, total. The Dischargers remain responsible for identification the full extent of groundwater impacts and corrective action to resolve those groundwater impacts. These WDRs direct the Dischargers to complete an EMP investigation to define the vertical and lateral extent of the groundwater impacts and submit a workplan to install the expanded groundwater extraction system as described in the Dischargers' 30 December 2022 modification to the 2016 Engineering Feasibility Study.

"Pre-Closure", Unit Closure, and Unit Classification Protocols

The Dischargers employ a drilling mud filling methodology which results in the gradual reduction of surface impoundment capacity to contain free liquids and seasonal precipitation. The Discharger proposes to fill surface impoundments with compacted drilling muds above adjacent perimeter levee elevations. The proposed methodology results in Units which operate and function as Class II non-municipal solid waste landfill waste management units.

These WDRs establish a process and requirements for the Dischargers to demonstrate to the Central Valley Water Board that drilling mud solids filling and compaction in the surface impoundments can occur above certain elevations in a manner that meets applicable standards for landfill waste management units while maintaining compliance with Title 27. The process described in these WDRs is intended to identify minimum requirements and milestones necessary for the Central Valley Water Board to consider

authorization of transition of certain Class II surface impoundments to units managed as Class II non-municipal solid waste landfills.

These WDRs provide for a “pre-closure” process intended to delineate the end of practical operational use of a basin as a Class II surface impoundment Unit and either closure of the Unit or continued use of the Unit managed as a Class II non-municipal solid waste landfill. The Dischargers may initiate the process by providing written notice placing a basin into a “pre-closure” operational status thereby triggering the following requirements:

1. Prohibition of discharge of additional free liquid wastes;
2. May continue to receive solid wastes provided the waste can be discharged in a manner supported by a stability analysis performed pursuant to Title 27 section 21750(f)(5) and in compliance with these WDRs;
3. Dischargers shall maintain capacity to contain liquid released from a basin due to compressive forces of accumulated wastes and design precipitation while maintaining the minimum freeboard requirements
4. Leachate collected from the leachate collection and removal system shall be discharged to a different authorized basin;
5. Contact storm water runoff may be discharged to a different authorized basin;
6. The dischargers may seek modifications to financial assurance requirements for the Unit to align with the nature of the Dischargers’ operation and the solids characteristics of the in-place drilling muds in a Class II non-municipal solid waste landfill Unit; and
7. Submission of a closure plan which includes an evaluation of and makes recommendations regarding the feasibility of clean closure of the surface impoundment.

At “pre-closure,” the Dischargers may submit a demonstration to the Central Valley Water Board that certain Class II surface impoundments to unit(s) can be managed as a Class II non-municipal solid waste landfill units. Central Valley Water Board authorization to transition a Facility Class II surface impoundment to a unit managed as a Class II non-municipal solid waste landfill is dependent upon Central Valley Water Board evaluation of, in part, required technical and financial information submitted by the Dischargers as described in these WDRs. Central Valley Water Board authorization to transition a Facility Class II surface impoundment to a unit managed as a Class II non-municipal solid waste landfill unit is neither guaranteed nor assured. For example, upon review of a closure plan, the Central Valley Water Board may direct the Dischargers to clean close a basin if specific facts, including evaluation of the required technical and financial information submitted by the Dischargers, do not support closure of a surface impoundment as a landfill, pursuant to Title 27 section 21400(b)(2)(A).

Information Sheet

Financial Assurance Mechanism and Minimum Amounts

The Dischargers' cost estimates and apparent available balance amounts for financial assurances do not meet minimum Title 27 requirements for closure and post closure maintenance. Staff analysis indicates at least approximately $2.7 million total financial assurances are required for the Facility. This Order requires the Dischargers to prepare revised cost estimates for closure, post closure maintenance, and corrective action costs which satisfy Title 27 requirements. Staff analysis estimates Closure / Post-Closure Pledged Account shortfall is $2,245,144 and the Corrective Pledged Account shortfall is $128,363, subject to adjustments and revisions required by this Order. This Order further requires the Dischargers to fully fund the Closure / Post-Closure Pledged Account and the Corrective Action Pledged Account by 1 November 2024.

Where the Central Valley Water Board provides written authorization for a fallback closure option of a basin pursuant to Title 27 section 21400(b)(2)(A), these WDRs authorize the Discharger to modify the cost estimate for minimum required financial assurances to consider closure of the Unit as a landfill in lieu of costs required for clean-closure of the Unit as a class II surface impoundment.