

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2014-XXXX

WASTE DISCHARGE REQUIREMENTS  
FOR  
AQUA CLEAR FARMS, INC. AND HATCH INVESTMENTS LIMITED PARTNERSHIP  
AQUA CLEAR FARMS FACILITY  
CLASS II SURFACE IMPOUNDMENTS AND LANDFILLS  
CONSTRUCTION, OPERATION, CLOSURE,  
POST-CLOSURE MAINTENANCE, AND CORRECTIVE ACTION  
SOLANO COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board) finds that:

1. Aqua Clear Farms, Inc. (facility owner and operator) and Hatch Investments Limited Partnership (landowner), hereafter referred to jointly as “Discharger”, own and operate the Aqua Clear Farms facility (facility) about 15.5 miles south of Dixon, in Section 12, T4S, R1E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order by reference. The facility has several surface impoundments used for processing and disposal of drilling mud and drill cuttings primarily from drilling of natural gas wells. The surface impoundments or “basins” are regulated under authority given in Water Code section 13000 et seq.; California Code of Regulations, title 27 (“Title 27”), section 20005 et seq. The currently active basins are lined and provide Class II containment under Title 27. Annual drilling mud disposal rates at the site have recently ranged from about 150,000 barrels (1 barrel = 42 gallons) to 225,000 barrels during 2010 to 2012. Historical disposal rates have been as high as 630,000 barrels in 1985.
2. The facility is on a 160-acre property at Flannery Road and Highway 113. The existing and future facility area is approximately 110 acres of which about 60 acres has been constructed. The facility consists of several lined and unlined surface impoundments, some of which have been closed as landfills. The locations of the existing basins and approximate location of future basins are shown in Attachment B, which is incorporated herein and made part of this Order by reference. The facility is comprised of Assessor’s Parcel Number (APN) 48-010-100.
3. The facility was initially operated by J&J Disposal from 1970 to 1973 under Resolution 70-157 that provided waste discharge requirements (WDRs) for disposal of drilling mud directly to the ground surface. At that time, the property was owned by a Mr. Flannery. The site was purchased by the Discharger in 1973, and WDRs 74-500 were issued requiring drilling mud and rainfall to be retained onsite by dikes. The Discharger constructed Basins 1 through 5 to contain the drilling mud and contact rainfall onsite. Basin 1 was an “auxiliary pond” that was not used for waste disposal and was removed in 2012. Following the issuance of WDRs 81-028, Basins 6 through 10 were constructed

with 12-inch to 18-inch thick clay liners in 1982-83 prior to the 1984 regulations requiring liner systems then contained in Chapter 15 of Title 23 (now in Title 27 as of 1997). In 1992 and 1993, WDRs 92-013 and 93-013 were issued requiring retrofitting of some basins with liners meeting the requirements of Chapter 15 and closure of others as landfills. An approved 30 to 54-inch replaceable clay liner was installed in Basin 8 in 1993. Following the issuance of WDRs R5-2002-0120, Basins 2 through 5 were closed as landfills and Class II double liner systems consisting of synthetic and clay components were installed in Basins 9 and 10.

4. Current operations at the facility generally consist of discharge of wet drilling mud from tanker trucks directly into double-lined Class II surface impoundments. The drilling mud solids settle to the bottom of the impoundment, and the water or "top water" rests on top of the mud. During the dry season, the top water evaporates or is transferred to another lined Class II basin and the underlying wet mud is mechanically processed with low ground pressure equipment to dry it. Once the mud reaches 50% moisture content or less, it is either moved to another lined Class II basin to make room for more incoming wet drilling mud, or it is compacted in place. Basins with dried mud compacted in place or that accept dried mud from other basins will be closed, incrementally, as landfills once filled with mud to final grade with 4H:1V side slopes above the top of the impoundment berms.
5. Current onsite facilities include four closed basins (Basins 2-5), two active double-lined basins (Basins 9 and 10), one formerly active clay-only lined basin that is being clean closed (Basin 8), two inactive basins (Basins 6 and 7), a truck washout area, an office trailer, various groundwater monitoring and extraction wells, and an industrial water supply well. Soil for the soil layers in basin liners and covers is currently excavated from where future Basins 11 through 13 will be located and was previously excavated from a soil borrow area west of the site entrance.
6. On 14 February 2014, the Discharger submitted an amended Report of Waste Discharge (ROWD). The information in the ROWD has been used in revising these waste discharge requirements. The ROWD contains the applicable information required in Title 27. The ROWD, including revisions to the amended ROWD submitted after 14 February 2014, and supporting documents contain information related to this revision of the WDRs including:
  - a. Updating the Findings to provide information about changes and improvements made at the facility since 2002.
  - b. Providing an updated water balance for the Class II surface impoundments and new requirements for freeboard to ensure the impoundments have capacity for seasonal precipitation and the design storm required in Title 27.
  - c. Providing information and requirements for how some of the Class II surface impoundments will be managed during filling and be closed as landfills once they are filled with dried drilling mud. This Order is intended to provide enough flexibility for the Discharger to either close current and future double-lined basins as landfills if they are

filled with dried drilling mud, or to clean close them if they are only used for discharge and processing of wet drilling mud and/or discharge of leachate and are no longer needed.

- d. Providing requirements for managing contact storm water as impoundments to be closed as landfills are filled with dried drilling mud above the top of the impoundment berm. Such contact storm water will be routed either to areas of the basin that are below the minimum freeboard level or to an adjacent lined Class II basin.
- e. Providing information about closing the existing truck washout basin and replacing it with steel tanks and half rounds at the existing washout location, and equipment to washout trucks at the Class II basins (currently Basin 9 and Basin 10).
- f. Providing information about the 2013 replacement of most of the wells in the groundwater monitoring network for the facility and replacement/upgrade of the groundwater extraction wells at the northeast corner of the facility where corrective action is being conducted for groundwater impacts.
- g. Providing updated financial assurances cost estimates for closure, post-closure maintenance, and corrective action and updated mechanisms for funding of financial assurances.

7. The existing and future waste management units regulated by this Order are described as follows:

<u>Unit</u>	<u>Approx. Area</u>	<u>Liner/LCRS<sup>1</sup> Components<sup>2</sup></u>	<u>Unit Classification &amp; Status</u>
Basin 1	2 acres	Unlined. Never accepted waste.	Former auxiliary basin. Removed in 2012, therefore no longer exists as a basin and is no longer regulated.
Basins 2 through 5	20 acres (total)	Unlined, closed as landfills. See closure Findings for final cover components.	Unclassified, closed. Surface impoundments closed as landfills.
Basin 6	6 acres	12 inch clay liner. Never accepted waste.	Unclassified, inactive. Can be an active Class II surface impoundment if liner system required in this Order is installed.
Basin 7	4 acres	12 to 18 inch thick clay liner. Drilling mud has been removed. A double liner and LCRS may be installed that is the same as Basins 9 and 10.	Unclassified, inactive. Can be an active Class II surface impoundment if liner system required in this Order is installed.

Basin 8	4 acres	30 to 54 inch replaceable clay liner. After clean closure, a double liner and LCRS will be installed that is the same as Basins 9 and 10.	Class II surface impoundment, inactive. Liner moisture detected 2013, discharges ceased. Liner to be removed. Discharger plans to install the double liner required by this Order and return to service as an active Class II surface impoundment.
Basin 9	5 acres	Double liner and LCRS. Secondary liner is composite. See Findings under "Design of Waste Management Units" below for details.	Class II surface impoundment, active. Currently used for discharge and processing of wet drilling mud.
Basin 10	4 acres	Double liner and LCRS. Secondary liner is composite. See Findings under "Design of Waste Management Units" below for details.	Class II surface impoundment, active. Mainly used for discharge of dried drilling mud from Basins 8 and 9 after it is dried.
Future Basins 11 through 13	16 acres total	Same liner as Basins 9 & 10. To be built as they are needed.	Class II surface impoundments, future.

<sup>1</sup> LCRS – Leachate collection and removal system

<sup>2</sup> All liner systems are composite liner systems unless otherwise noted

8. On 7 June 2002, the Central Valley Water Board issued WDRs R5-2002-0120 in which specific waste management units at the facility were classified as a Class II units for the discharge of designated waste. This Order continues to classify specific waste management units as Class II units in accordance with Title 27, as noted in Finding 7 above. Since 2002, the Discharger has made the following improvements at the facility:
  - a. Basins 2 through 5 that contain dried drilling mud have been closed as landfills with the final cover required by Order R5-2002-0120.
  - b. Drilling mud has been removed from Basins 7, 9, and 10 as required by previous Orders.
  - c. Basins 9 and 10 have been retrofitted with the double liner systems required by Order R5-2002-0120 that include an LCRS between the geomembrane layers of the liner providing full Class II containment, and include unsaturated zone monitoring systems.
  - d. The Discharger provided cost estimates and established a trust fund for financial assurances for closure, post-closure maintenance, and corrective action as required by Order R5-20020-0120, although those will now be updated as proposed and as required by this Order.

- e. Basin 8 was taken out of service during 2013 since the single replaceable clay liner showed breakthrough at the pan lysimeter one foot above the bottom of the liner [which is expected for a replaceable clay liner per Title 27 section 20330(e)]. Basin 8 will be clean closed over the next two years and later will be retrofitted with a double liner system in accordance with this Order and brought back into service as a Class II surface impoundment.
  - f. Most of the groundwater monitoring wells were replaced with new wells during 2013 due to damage or deterioration of the old wells.
  - g. The groundwater extraction wells for the corrective action system that extracts groundwater from the northeast corner of the site (where previous practices of discharging drilling mud directly to the ground surface caused salt contamination of the perched shallow groundwater) have been replaced with larger diameter wells and new pumps to provide better extraction.
9. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements, dated November 2013 (SPRRs) which are attached hereto and made part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2014-XXXX and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all facilities regulated under Title 27 are considered to be “standard” and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through H) of these WDRs, and the requirement in the WDRs supersedes the requirement in the SPRRs.

#### **WASTE CLASSIFICATION AND UNIT CLASSIFICATION**

10. The Discharger proposes 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.
11. 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 waste management unit, 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.

Designated waste can be discharged only at Class I waste management units, or at Class II waste management units which comply with Title 27 and have been approved by the regional board for containment of the particular kind of waste to be discharged.

12. The wastes the Discharger proposes to continue discharging are drilling mud and drill cuttings from natural gas wells and directional drilling. Most of the waste received at the facility is drilling mud from drilling of natural gas wells. Prior to drilling of a natural gas well, the drilling mud consists of bentonite clay mixed with water. The drilling mud is pumped down the drill string and returns to the surface through the borehole. 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. The drill string passes through ancient sedimentary formations that contain naturally-occurring chemical constituents and salts that are transported to the surface in the drilling mud. Testing conducted by the Discharger in 1990 and 1999 showed that dried drilling mud has hydraulic conductivity in the  $10^{-7}$  to  $10^{-8}$  centimeters per second (cm/s) range.
13. The incoming drilling mud has electrical conductivity averaging about 1,200 to 1,500 umhos/cm as measured during load checking, but the values measured in the processing basins increase due to evapoconcentration. The Discharger provides data in required semi-annual monitoring reports for liquid (or top water) samples collected from the basins. Recent data are shown in the table below. The first three samples shown are from Basin 8 and the last three are from Basin 10. The table also includes the California secondary maximum contaminant level (secondary MCL), the lowest applicable water quality objective (WQO) for groundwater for protection of drinking water beneficial use for domestic and municipal supply wells, and the background groundwater quality from background monitoring well 6A at the site.

Date	TDS (mg/L)	Electrical Conductivity (umhos/cm)	Chloride (mg/L)	Sulfate (mg/L)	TPH Diesel (mg/L)
11/17/2010	63,000	97,500	44,000	280	2.90
5/12/2011	33,000	62,000	26,000	190	11.00
11/21/2011	67,000	98,000	44,000	1,300	11.00
6/5/2012	110,000	140,000	77,000	5,200	0.14
5/22/2013	97,000	83,000	48,000	700	NA
12/3/2013	30,000	40,000	17,000	380	0.13
CA Secondary MCL	500	900	250	250 (U.S. Primary MCL is 500)	None
Lowest Applicable WQO	450 (Agricultural Goal)	700 (Agricultural Goal)	106 (Agricultural Goal)	250	0.056 (USEPA IRIS Ref Dose)
Site Background Groundwater Data (MW6A)	Typical range is 360 to 450	Typical range is 550 to 750	Typical range is 30 to 60	Typical range is 25 to 45	Non-Detect

14. The data indicate that the discharge consists of or contains pollutants that, under ambient environmental conditions at a waste management unit, 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. Therefore, the discharge is a 'designated waste' and as such must be discharged to a Class II waste management unit as required by Title 27.
15. The Discharger proposed to continue to discharge leachate from the LCRS of the Class II surface impoundments back to the impoundment, or once filled with dried mud to the point where no further liquid discharge can occur, to another onsite Class II surface impoundment. Contact storm water from basins that are filled with dried drilling mud will be directed by channels to areas of the basin that are below the minimum freeboard level or to an adjacent Class II basin until final cover is installed. The liner systems of adjacent double-lined basins are designed to overlap such that such drainage is always fully contained. Drilling mud top water will also continue to be transferred between active Class II basins when necessary to maintain required freeboard levels. If Basin 6 (or a portion of the basin) is lined and becomes active, the Discharger may decide to use it only for leachate and top water discharge from the other basins, or may decide use it for processing and/or disposal of drilling mud as well.
16. During clean-closure of Basin 8, the Discharger proposes to remove and discharge the clay liner system and at least two feet of contaminated adjacent geologic materials to Basin 10 which is currently accepting dried drilling mud from Basins 8 and 9.
17. As part of drilling mud discharge activities, the incoming trucks will continue to be washed out prior to exiting the facility. Wash water will be discharged either directly to the active Class II basins, or to the truck washout area near the site entrance. Since the existing truck washout area is unlined, this Order requires the washout area to be clean closed by moving the drilling mud to one of the active Class II basins and to construct a new washout area with steel tanks and half rounds (as proposed in the ROWD) that are exempt from Title 27 under section 20090(i). This Order includes a time schedule for upgrading the truck washout area as proposed.

### **SITE DESCRIPTION**

18. The site is located at the intersection of Highway 113 and Flannery Road near Highway 12 south of Dixon and west of Rio Vista. The site is surrounded by gently rolling hills, grasslands, and agricultural land. 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.
19. Land uses within one mile of the facility are predominantly agricultural, grazing, and open space. There are no domestic 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.

20. 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.
21. The measured hydraulic conductivity of the native soils underlying the waste management units ranges between  $1.5 \times 10^{-4}$  cm/s in the most permeable of the perched and isolated water-bearing zones to hydraulic conductivities in the  $10^{-7}$  to  $10^{-8}$  cm/s range for the more clayey soils.
22. The ROWD states that the nearest Holocene-era fault is the Green Valley Fault approximately 20 miles from the site, that the Hayward fault is approximately 35 miles from the site, and that the San Andreas Fault is approximately 50 miles from the site. The ROWD states and this Order requires that a stability analysis be included in the Final Closure Plan for the double-lined Class II surface impoundments for closure as landfills using the peak ground acceleration from the Maximum Credible Earthquake as required by Title 27.
23. The average annual precipitation at the facility is 16.55 inches based on the Rio Vista Station. The ROWD states that the mean pan evaporation is 60.49 inches per year multiple stations in the area after applying an evaporation coefficient of 0.80.
24. The 100-year wet season was calculated to be 27.34 inches based on data from the Western Regional Climate Center for the Rio Vista Station.
25. The 1,000-year, 24-hour precipitation event for the facility is estimated to be 6.43 inches, based on Precipitation Frequency Estimates for the Oakley Station.
26. The waste management facility is not within a 100-year flood plain.

## **SURFACE WATER AND GROUNDWATER CONDITIONS**

27. The *Water Quality Control Plan for Sacramento and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
28. Surface drainage from approximately 90% of the facility area drains to a culvert under Highway 113 near the northeast corner of the site that flows to "Big Ditch", a tributary to Lindsay and Cache Sloughs which flow into the Sacramento River within the Sacramento-San Joaquin Delta. Other areas of the site drain to a soil borrow area that is located to the west of the site entrance.

29. The beneficial uses of the Sacramento-San Joaquin Delta, as designated in the Basin Plan, are: municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; water contact and non-contact water recreation; warm freshwater habitat; cold fresh water habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.
30. 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<sup>1</sup> as defined in the Basin Plan. The first known aquifer underlying the site is in the Tehama Formation that resides approximately 200 feet below surface grade.
31. In many cases, the perched groundwater exists in confined more permeable layers that may be considerably deeper than the groundwater elevations measured in the monitoring wells since the groundwater rises up the well casing from the more permeable layers to a potentiometric surface. Therefore, the groundwater contours from water level measurements in the wells generally represent a potentiometric surface, not the actual elevation of groundwater beneath the basins. For instance, the potentiometric water elevation in well 8R typically ranges from about 86 ft-msl to 95 ft-msl. However, during the boring for well 8R, the first (minor) source of groundwater was encountered at elevation 74 ft-msl, and the primary source of groundwater was encountered at elevation 60 ft-msl. These saturated zones are considerably deeper than the potentiometric water surface measured in the well. The two saturated zones encountered in well 8R are also approximately 18 feet and 32 feet below the Basin 9 sump elevation (respectively) and even further below the Basin 10 sump elevation. For wells 11R and 12R that are also close to Basins 9 and 10, no saturated zones or free water was encountered during drilling of the boreholes that were drilled to a depth of 67 ft-msl, and it takes three days for enough water to collect in these wells to allow sampling after the wells are purged.
32. Monitoring data indicate background groundwater quality for first encountered groundwater (at background well 6A) has electrical conductivity generally ranging between 550 to 750 umhos/cm, with total dissolved solids (TDS) generally ranging between 360 and 450 milligrams per liter (mg/L).

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<sup>1</sup> In defining an aquifer, the Basin Plan states on page I-1.00 "Where ground water occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield significant quantities of water to wells or springs, it can be defined as an aquifer." Further, in reference to what is considered "significant quantities of water", the Basin Plan states on page II-3.00 "The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day."

33. The direction of groundwater flow is generally toward the northeast based on water level measurements of the potentiometric surface. The average potentiometric groundwater gradient during 2013 was approximately 0.017 feet per foot.
34. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal water supply, agricultural supply, industrial service supply, and industrial process supply. 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.

### **GROUNDWATER, UNSATURATED ZONE, AND SURFACE WATER MONITORING**

35. The Discharger voluntarily submitted a proposed modification to the groundwater monitoring network in December 2011. Many of the monitoring wells were 25 to 30 years old, had questionable surface seals, and were not screened at intervals that were best for detection monitoring, evaluation monitoring, and/or corrective action. A work plan and addendums were requested and submitted during 2012 for additional information about well abandonment, installation, re-purposing of wells, and extraction well design. The work plan/addendums were approved in October 2012, and field work was completed in March 2013.
36. The current groundwater monitoring network for the Class II surface impoundments consists of background monitoring well 6A, and detection or corrective action monitoring wells 2R, 3R, 7A, 8R, 10R, 11R, 12R, EMP-5, EMP-6, HA-3, HA-7, and HA1R, as shown on Attachment C. The list of monitoring wells and their monitoring designations is included in the attached MRP R5-2014-XXXX.
37. The Discharger's detection monitoring program for groundwater at the facility satisfies the requirements contained in Title 27. Additional monitoring wells will be required as part of any new Class II surface impoundment installation at the site if the existing monitoring well network is inadequate for detection monitoring for the new basin(s).
38. The unsaturated zone monitoring system for the active Class II surface impoundments consists of suction lysimeters/gypsum moisture blocks LYS-B9 for Basin 9 and LYS-B10 for Basin 10, as shown on Attachment C. Basin 8 is no longer in service and will be clean closed, so the lysimeters for Basin 8 shown on Attachment C are no longer monitored and will be taken out as part of the clean closure. Additional lysimeters will be installed as part of any new Class II surface impoundment installation at the site.
39. The Discharger collected baseline soil pore water samples from the suction lysimeters for Basins 9 and 10 for later comparison with monitoring results. For both basins, the baseline values for electrical conductivity were about 11,000 umhos/cm. The baseline values are elevated relative to expected values for background soil conditions due to previous drilling mud disposal in the basins in the 1980s prior to construction of the double liners. The Discharger will compare future samples with the baseline values along with

tracking changes in soil moisture (in kilopascals of water tension) from the gypsum moisture blocks for determining if there is a new release to the unsaturated zone.

- 40. The Discharger's detection monitoring program for the unsaturated zone satisfies the requirements contained in Title 27.
- 41. The Discharger monitors 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 shown on Attachment C. The MRP requires two samples per year for the same list of constituents that are monitored for groundwater. The facility also has coverage under the general Industrial Storm Water Permit.
- 42. The Discharger submitted a 1 November 1998 Water Quality Protection Standard (WQPS) report entitled *Ground Water Constituents of Concern Delineation Assessment Report* proposing statistical data analysis methods to calculate concentration limits for each monitored constituent in accordance with Title 27. The WQPS report proposed to use Interwell data analysis to calculate tolerance limits for the monitored constituents. The WQPS and approved data evaluation methods are included in MRP R5-2014-XXXX.

**GROUNDWATER DEGRADATION AND CORRECTIVE ACTION**

- 43. Shallow groundwater at the site has been impacted with salt constituents from historical drilling mud disposal practices, particularly when wet drilling mud was discharged directly to the ground surface in the early 1970s, to unlined basins Basins 2 through 5 later in the 1970s, and to Basins 7 through 10 with 18-inch thick clay liners in the 1980s as was allowed by the WDRs and the regulations at the time. High salinity was discovered in shallow groundwater in the early 1980s after installation of monitoring wells 2 through 6. Elevated constituents include TDS, chloride, sulfate, sodium, and other inorganics. Additional wells were installed in 1983 through 1985 including monitoring wells 7 through 10, and additional clustered wells at varying depths. Several investigations have been conducted at the site since the 1990s that have included additional monitoring wells, extraction wells, borings, test pits, waste characterization. As stated in previous Findings, most of these monitoring wells were replaced during 2013. As of December 2013, the total dissolved solids concentrations (in milligrams per liter) in groundwater in the current monitoring wells were as follows:

Date	2R	3R	6A	7A	8R	10R	11R	12R	EMP-5	EMP-6	HA1R	HA-3	HA-7
12/3/2013	5,600	22,000	380	2,700	3,200	11,000	5,100	7,400	920	1,800	12,000	2,500	530

- 44. In 1992 and 1993, the Central Valley Water Board issued WDRs requiring corrective action for groundwater impacts and for Basin 8 to be lined in accordance with regulations that are now contained in Title 27. Cease and desist orders were issued in 1995 and 1998 requiring specific basins to have liquid removed, be closed, and/or be cleaned out. Requirements to closed Basins 2 through 5 were also placed in the previous WDRs

R5-2002-0120. Basin 8 was lined in 1993 and used for drilling mud discharge and processing until the replaceable clay liner showed breakthrough to the leachate detection system pan lysimeter in the liner in 2013. Drilling mud was removed from Basins 7, 9, and 10 as required, and Basins 9 and 10 have since been retrofitted with double liners. Between 2003 and 2011, Basins 2 through 5 were closed with the final cover approved in WDRs R5-2002-0120.

45. An Evaluation Monitoring Program report was submitted in 1998, and a Corrective Action Program (CAP) was submitted in 1999. The CAP was approved in WDRs R5-2002-0120 and previously consisted of groundwater extraction from wells 3, 3B, HA-1A, and P-5 that were located at the northeast corner of the facility. The wells produced very little water due to the construction of the wells and the limited nature of the higher permeability layers of perched groundwater in which they were screened. During 2013, in accordance with an approved work plan, the Discharger replaced the two inch diameter extraction wells with larger four inch diameter wells and installed upgraded pumps to improve flow rates. The current CAP now consists of groundwater extraction from the new four inch diameter wells that include 3R, 10R, and HA1R. Groundwater extraction rates with the new wells are higher than the old wells, but are still relatively 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. Extracted groundwater is routed to the active double-lined Class II surface impoundments.
46. On 27 December 2013, Central Valley Water Board staff issued a letter to the Discharger requesting additional work to further investigate the extent of impacted groundwater and to expand the groundwater extraction network. The letter included dates through December 2014 by which the Discharger was/is to submit reports presenting the results of investigations, proposing improvements, and documenting the work. On 16 April 2014, The Discharger submitted a proposed alternate compliance time schedule which would establish a date of 1 July 2015 to complete field investigations, design of proposed improvements, and reporting and documentation of the work. In accordance with the proposed time schedule, the Discharger submitted a work plan on 15 May 2014 for Central Valley Water Board staff review and approval describing the field investigation and subsequent reporting. The additional work is ongoing and any needed improvements will depend on results of the investigation and discussions with Central Valley Water Board staff on what additional corrective action measures are needed to capture impacted groundwater more effectively. This Order includes a time schedule for the Discharger to submit a report documenting completion of this work pursuant to the Discharger's approved proposals to improve the effectiveness of the CAP.

## **DESIGN OF WASTE MANAGEMENT UNITS**

### **Liner System**

47. Water Code section 13360(a)(1) allows the Central Valley Water Board to specify the design, type of construction, and/or particular manner in which compliance must be met in

waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.

48. As approved in previous WDRs R5-2002-0120, and as installed in Basin 9 and 10, the Discharger continues to propose a double liner system for future Class II surface impoundments consisting of, from top to bottom:

- 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  $5 \times 10^{-7}$  cm/s.

The one foot low hydraulic conductivity soil layer is not as thick as the prescriptive two foot thick layer in Title 27; however, an additional geomembrane is immediately above the clay layer that is not specifically required by Title 27. This constitutes an engineered alternative liner system (see Findings 51 through 53 below). The combination of the geomembrane and low hydraulic conductivity soil constitute a composite secondary liner that is less permeable than the prescriptive soil liner would be by itself.

49. A two-foot soil operations layer has been/will be installed above the liner system using the onsite fine-grained soils that includes an orange geotextile at the midpoint of the layer to warn the operator if drilling mud processing equipment is nearing the liner system.

50. The LCRS of each double lined basin drains to a sump where leachate is pumped back into the basin. The LCRS is designed with capacity for at least twice the maximum anticipated daily volume of leachate. To date, there has been no measureable leachate flow to the LCRS sump in Basin 9 which may be due in part to the low hydraulic conductivity of the drilling mud in the basins preventing significant hydraulic head on the primary liner. Some leachate was initially detected in the Basin 10 sump and was removed. The basin has since been filled with several feet of dried drilling mud that will remain in place as it continues to be filled for closure as a landfill.

51. The Central Valley Water Board approved the double liner system for future Class II surface impoundments in previous WDRs R5-2002-0120, which is an engineered alternative to the prescriptive liner in Title 27. Title 27 section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27 section 20080(c)(1) or (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27 section 20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered

alternative(s) provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27 section 20080(b)(2) of Title 27 and that any proposed engineered alternative is consistent with the performance goal in accordance with Title 27 sections 20240, 20250, and 20310.

52. The engineered alternative liner system has been and will be designed, constructed, and operated to prevent migration of wastes from the Unit to adjacent natural geologic materials, groundwater, or surface water during disposal operations, closure, and the postclosure maintenance period in accordance with the criteria set forth in Title 27 for Class II waste management units.
53. The Discharger adequately demonstrated that construction of the liner prescriptive standard for the Class II surface impoundment as described in Title 27 would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design because the alternative affords equivalent of better protection, and the soil component of the liner costs significantly less to construct. The Discharger has demonstrated that the proposed engineered alternative is consistent with the performance goals of the containment structures for a Class II waste management unit affords equivalent or superior protection against water quality impairment than is required by Title 27. This Order continues to approve and require the proposed engineered alternative liner system for Basins 9, 10, and any future Class II surface impoundments at the site.

### **Water Balance and Freeboard**

54. 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 site is 6.43 inches, and is referred to hereafter as the "design storm". For Title 27-required seasonal precipitation, the Discharger has been required to use the 100-year wet season distributed monthly to prevent overflow of the impoundment or less than two feet of freeboard during a reasonable worst-case scenario wet season. The 100-year wet season for the site is 27.34 inches.
55. The Discharger submitted a water balance for the surface impoundments that is included in the ROWD. Based on the water balance in the ROWD, the Discharger reports that the surface impoundments will have sufficient capacity to maintain more than two feet of freeboard and the required additional volume for the design storm event during the height of the 100-year wet season. The ROWD contains a table (Table 4 in the ROWD) for the water balance showing that the maximum amount of rainwater that would accumulate in the impoundments would be 1.26 feet during the month of March. A summary of the water balance table is as follows:

<b>Month</b>	<b>100-Year Wet Season (Inches)</b>	<b>Evaporation (Inches)</b>	<b>Cumulative Rainwater in Impoundment (Feet)</b>
July	0.00	9.3	-0.86
August	0.00	8.3	-1.55
September	0.00	6.3	-2.08
October	0.94	4.3	-2.36
November	0.84	2.0	-2.46
December	8.82	1.0	0.65
January	5.54	1.0	1.03
February	4.00	1.5	1.24
March	3.09	2.9	1.26
April	3.43	4.4	1.18
May	0.68	7.3	0.63
June	0.00	8.6	-0.09
<b>Total</b>	<b>27.34</b>	<b>56.9</b>	<b>---</b>

56. 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 (design storm). Freeboard is the vertical distance between the lowest elevation of a surface impoundment berm and the water surface. The Class II surface impoundments must maintain a minimum freeboard of at least 2.5 feet at all times, except in the event of a storm equal to or exceeding the design storm event in which case at least 2.0 feet of freeboard must be maintained. Freeboard shall be returned to at least 2.5 feet within 14 days after the occurrence of a design storm event. The extra 0.5 feet of freeboard (2.0 feet plus 0.5 feet) is required so that the impoundments always have additional capacity for the design storm. Any “top water”, rainfall, or contact storm water runoff, which is 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. Freeboard requirements do not apply to the drilling mud solids that are discharged above the 2.5 freeboard level as the impoundments are readied to be closed as a landfill. Dried drilling mud may continue to be placed in surface impoundments above the 2.5 freeboard level as long as the moisture holding capacity of the waste is not exceeded (i.e., liquid is not free draining; Section 20200(d) of Title 27).

57. This Order implements wet season freeboard requirements in accordance with the water balance by requiring Class II surface impoundments to have at least 3.75 feet of freeboard by 1 November of each year. This amount of freeboard is necessary to accommodate cumulative rainwater from a 100-year wet season (shown in the table in Finding 55) while maintaining a minimum of 2.5 feet of freeboard during the entire wet season. Impoundments with 3.75 feet of freeboard or less cannot accept wet drilling mud

between 1 November and 30 April. 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.

### **LCRS Action Leakage Rate**

58. 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 Discharger is 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. Using this recommendation, the calculated ALR for Basin 9 is 5,000 gpd for the 5-acre impoundment, and the ALR for Basin 10 is 4,000 gpd for the 4-acre impoundment. 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.

### **SURFACE IMPOUNDMENT CLOSURE**

59. The Discharger included an updated Preliminary Closure Plan (PCP) for the surface impoundments in the ROWD. The Discharger proposes to close some of the double-lined Class II surface impoundments as landfills after they have been filled with dried drilling mud pursuant to Title 27 section 21400(b)(2)(A), and to clean close others pursuant to Title 27 section 21400(b)(1). This Order does not require clean closure of the surface impoundments being filled with dried drilling mud due to the waste being a solid after the water is evaporated. The PCP proposes to prepare, and this Order requires, that a final closure plan be submitted and approved prior to commencing closure activities for impoundments that are closed as landfills. Closure of Class II surface impoundments as landfills does not change the classification of the surface impoundments to a landfill. Surface impoundments closed as landfills must 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 surface impoundments as landfills.

60. The Discharger proposes the same engineered alternative final cover for closure of double-lined Class II surface impoundments as landfills that was approved for basins

closed as landfills by previous WDRs R5-2002-0120 and installed when Basins 2 through 5 were closed as landfills. This Order additionally requires that the one-foot compacted soil layer have maximum hydraulic conductivity of  $1 \times 10^{-6}$  cm/s. The approved final cover consists of, from top to bottom, the following:

- a. A one-foot erosion-resistant soil layer containing no waste and covered with grass vegetation.
- b. A geocomposite drainage layer to drain rainwater that percolates through the erosion-resistant soil layer laterally to the edge of (and away from) the unit.
- c. A one-foot soil layer compacted to a minimum 90 percent of maximum relative dry density and has maximum hydraulic conductivity of  $1 \times 10^{-6}$  cm/s in accordance with Title 27 section 21090(a)(2).
- d. A two foot thick high-compaction foundation layer that may contain dried drilling mud.

61. The Discharger proposes, and this Order requires, that Class II surface impoundments closed as landfills have external side slopes with maximum steepness of 4H:1V and that the top deck have a minimum 3% slope for drainage. The ROWD states that Discharger has 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 3H:1V.

62. The Discharger conducted computer modeling (using the HELP model) that indicates approximately 4 percent of rainfall would percolate through the proposed engineered alternative final cover compared with 14 percent for a Title 27 prescriptive standard final cover. The Discharger assumed a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s for modeling of the clay layer for both the engineered alternative and prescriptive final covers. These modeling results indicate that the proposed engineered alternative design for the final cover will minimize percolation of water into the waste at least as well as the prescriptive standard design prescribed in Title 27 and indicates that the proposed design meets the performance standard for final covers in Title 27. The approval of this final cover also takes into account the fact that the dried drilling mud contains low hydraulic conductivity bentonite clay and that moisture that percolates through the final cover system will be absorbed by the bentonite and also be significantly impeded from percolating through the waste to the LCRS.

63. Basin 8 that has a replaceable clay-only liner will be clean-closed. After the Basin 8 top water is evaporated and/or transferred to Basin 9, the dried drilling mud, clay liner, and the top two feet of adjacent geologic materials will be removed and discharged to Basin 10. This Order includes a two-year time schedule for completion of clean closure of Basin 8. At least two more years are needed due to the large amount of unprocessed drilling mud (30,000 cubic yards) remaining in the basin and to allow time to evaporate or transfer top water and dry the mud during the summer months prior to discharging dried

mud to Basin 10. There is no immediate threat to groundwater from the drilling mud in Basin 8 since the pan lysimeter that detected breakthrough is located one foot above the bottom of the clay liner as required by Title 27. When needed, the Discharger plans to install a new double liner system in Basin 8 and use it for discharge and processing of wet drilling mud. At some point in the future, Basin 8 will either be clean closed again, or be closed as a landfill if used for discharge of dried drilling mud from other future double-lined basins (such as Basin 7 if it is lined, or future Basins 11, 12, and 13).

64. Basin 9 is currently being used for discharge and processing of wet drilling mud. In the future, Basin 9 will accept dried drilling mud from future double lined basins and be closed, incrementally, as a landfill. Basin 10 is currently being filled with dried drilling mud and will be closed, incrementally, as a landfill once final grades for each closure area of the basin are reached. Final grade of highest point for Basin 10 will be approximately +150 ft-msl, plus an amount to achieve at least 3% grade, as shown on Figure 25 in the amended ROWD. The liner systems for Basins 9 and 10 were designed to overlap in anticipation of the basins sharing a continuous final cover after dried drilling mud is placed to fill the area between them. The cover will be installed in two or more phases (partial final closure) as final slopes will be reached in Basin 10 prior to final slopes being reached in Basin 9. Final grade of highest point for Basin 9 will be approximately +155 ft-msl. A partial Final Closure/Post-closure Maintenance Plan is required to be submitted at least 180 days prior to initiating partial final closure activities.
65. The Discharger may also plan to extend the dried drilling mud filling the areas between Basin 9/Basin 8 and Basin 8/Basin 7 in the future by overlapping those liner systems when they are constructed. These WDRs are intended to allow flexibility for how the basins will be operated, designed, and closed pending approval of basin designs by Central Valley Water Board staff so long as the operation, liner system design, and final cover design comply with the requirements of this Order.

#### **POST-CLOSURE MAINTENANCE OF IMPOUNDMENTS CLOSED AS LANDFILLS**

66. The Discharger submitted a Preliminary Post-Closure Maintenance Plan (PPCMP) as part of the February 2014 ROWD. The PPCMP includes plans for inspecting, maintaining, and repairing the final cover for Class II surface impoundment that are closed as landfills. This Order requires the Discharger to conduct post-closure maintenance for all units closed as landfills in accordance with the PPCMP and/or any future plan approved by Central Valley Water Board staff that is in compliance with this Order.
67. The Discharger is required to inspect and identify problems with the final covers of surface impoundments closed as landfill including areas that require replanting of vegetation, areas with erosion, areas lacking free drainage, and to repair the cover.
68. Throughout the post-closure maintenance period, the Discharger is required to maintain the structural integrity and effectiveness of all containment structures, continue to operate the LCRS as long as leachate is generated and detected, maintain the monitoring

systems, and prevent erosion and related damage of the final cover due to drainage pursuant to Title 27 section 21090(c).

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

### FINANCIAL ASSURANCES

70. **For Closure:** The PCP includes an itemized cost estimate for third party costs to close the surface impoundments. The total of the estimate for closure of Basins 9 and 10 is **\$947,504** in 2014 dollars. The total estimate for the first phase of the Basin 10 partial closure is \$152,090. These cost estimates are approved by the adoption of these WDRs. Pursuant to Title 27 section 22207(a), this Order requires the Discharger to establish and maintain financial assurances for closure of the Class II surface impoundments in accordance with the approved cost estimates naming the Central Valley Water Board as the beneficiary. This Order requires the amount of the minimum annual deposit into the closure fund to 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. According to the amended ROWD, current calculations show the required annual deposit to be \$25,348 such that the first phase of the Basin 10 partial final closure is funded by the time that phase is ready to be closed; however, this amount may change annually depending on the new calculation. This Order also requires annual adjustments to account for inflation by 1 June of each year.
71. **For Post-Closure Maintenance:** The PCP includes an itemized cost estimate for third party costs for post-closure maintenance of the current closed and active surface impoundments to be closed as landfills (Basins 2-5, 9, and 10), and includes costs for monitoring and reporting for groundwater, surface water, and leachate for the entire site. The estimated annual post-closure cost is \$11,260 per year in 2014 dollars, of which \$2,500 is for final cover maintenance and repair and \$8,760 is for groundwater, surface water, and leachate monitoring and reporting. Title 27 section 22211 requires a multiplier of 30 to account for 30 years of post-closure maintenance, bringing the required amount to  $\$11,260 \times 30 = \mathbf{\$337,800}$ . This cost estimate is approved by the adoption of these WDRs. Pursuant to Title 27 sections 22211 and 22212(a), this Order requires the Discharger to establish and maintain financial assurances for post-closure of the surface impoundments in accordance with the approved cost estimate naming the Central Valley Water Board as the beneficiary. This Order requires the amount of the minimum annual deposit into the post-closure fund to be in accordance with Title 27 section 22225(a)(2)(B). According to the amended ROWD, current calculations show the required annual deposit to be \$11,260; however, this amount may change annually depending on the new calculation. This Order also requires annual adjustments to account for inflation by 1 June of each year.

72. **For Corrective Action:** On 21 May 2014, the Discharger submitted an updated cost estimate for corrective action of **\$64,800** in 2014 dollars. The cost estimate is based on ten years of operation and maintenance (O&M) for the existing extraction wells, installation and O&M for two new extraction wells, and a 20% contingency. This cost estimate is approved by the adoption of these WDRs. Pursuant to Title 27 section 22222, this Order requires the Discharger to establish financial assurances for corrective action in accordance with the approved cost estimate naming the Central Valley Water Board as the beneficiary. As proposed in the amended ROWD, this Order requires an initial deposit of \$32,400 by 1 June 2015, and minimum annual deposits into the corrective action fund in accordance with Title 27 section 22226 such that it is fully funded by 1 June 2020. This Order also requires annual adjustments to account for inflation by 1 June of each year.

### CEQA AND OTHER CONSIDERATIONS

73. 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 for the project on 12 December 1991 in accordance with the California Environmental Quality Act, (Public Resources Code Section 21000, et seq.), and the State Guidelines. Solano County issued a revised Use Permit in February 1992, and minor revisions to the permit were made in 1993 and 2010.

74. The action to revise WDRs for the facility is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Title 14, CCR, Section 15301.

75. This order implements:

- a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition.*
- b. The prescriptive standards and performance goals of California Code of Regulations, title 27, section 20005 et seq., effective 18 July 1997, and subsequent revisions.

76. Based on the threat and complexity of the discharge, the facility is determined to be classified 2-B as defined below:

- a. Category 2 threat to water quality, defined as, "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."
- b. Category B complexity, defined as, "Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units."

77. Water Code section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports..."
78. The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2014-XXXX" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

### **PROCEDURAL REQUIREMENTS**

79. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
80. The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
81. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
82. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date that this Order becomes final, except that if the thirtieth day following the date that this Order becomes final falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

[http://www.waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://www.waterboards.ca.gov/public_notices/petitions/water_quality)

or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to California Water Code sections 13263 and 13267, that Order No. R5-2002-0120 is rescinded except for purposes of enforcement, and that Aqua Clear Farms, Inc. and Hatch Investments Limited Partnership, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

#### **A. PROHIBITIONS**

1. The discharge of 'hazardous waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in California Code of Regulations, Title 23, section 2510 et seq.
2. The discharge of solid waste or liquid waste to surface waters, surface water drainage courses, or groundwater is prohibited.
3. The discharge of wastes outside of a waste management unit or portions of a waste management unit specifically designed for their containment is prohibited.
4. The discharge of any waste to the former Basin 1 area is prohibited.
5. The discharge of any additional waste to Basins 6, 7, or 8 is prohibited unless and until they are retrofitted with liner systems meeting the requirements of this Order and the final construction report is approved in writing by Central Valley Water Board staff.
6. The discharge of asbestos-containing waste is prohibited.
7. The discharge of production water, produced water, or any wastewater that is not part of drilling mud (other than site groundwater, truck washout water, or contact storm water runoff from drilling mud solids) is prohibited.
8. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements dated November 2013 (SPRRs).
9. The discharge of truck wash water directly to land is prohibited after **15 October 2015**.

#### **B. DISCHARGE SPECIFICATIONS**

1. The discharge shall not cause a condition of pollution or nuisance as defined by the Water Code section 13050.
2. The Discharger shall only discharge waste types as described in the Findings of this Order under "Waste Classification and Unit Classification".

3. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs dated November 2013.

### C. FACILITY SPECIFICATIONS

1. 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 MRP R5-2014-XXXX.
2. The Discharger shall maintain a minimum **2.5 feet** of freeboard, as measured from the water surface to the lowest point of the basin levee, in the active Class II surface impoundments at all times. However, in the occurrence of precipitation within 24 hours equal to or exceeding the 1,000-year, 24-hour event as defined in this Order, at least 2.0 feet of freeboard shall be maintained. The Discharger shall not discharge wet drilling mud or leachate to a Class II surface impoundment with freeboard of 2.5 feet or less. Any water, rainfall, or contact storm water runoff that is present in a Class II surface impoundment in violation of the minimum freeboard requirement must be immediately removed from the surface impoundment to another active Class II surface impoundment with available freeboard or to an offsite permitted facility. Freeboard requirements do not apply to the dried drilling mud solids that are discharged above the 2.5 freeboard level as the impoundments are readied to be closed as a landfill. Dried drilling mud may continue to be placed in surface impoundments above the 2.5 freeboard level as long as the moisture holding capacity of the waste is not exceeded (i.e., liquid is not free draining; Section 20200(d) of Title 27).
3. The Discharger shall ensure, on or before **1 November** of each year, that freeboard in each active Class II surface impoundment is at least **3.75 feet**, as measured from the water surface<sup>2</sup> to the lowest point of the basin levee, in order to accommodate seasonal precipitation. Impoundments with 3.75 feet of freeboard or less shall not accept wet drilling mud between **1 November** and **30 April** of each year. Water may be transferred from one active double-lined Class II surface impoundment to another to maintain required freeboard in all basins.
4. When dried drilling mud fills a surface impoundment to within 2.5 feet (year round) or 3.75 feet (1 November to 30 April) of the berm over the entire area of the impoundment, the impoundment shall no longer accept wet drilling mud waste, top water from other basins, or leachate. Leachate from the basin LCRS shall be discharged to another Class II basin with freeboard capacity. Dried drilling mud may continue to be placed in the impoundment as long as the moisture holding capacity of

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<sup>2</sup> If there is no water in the impoundment at the time of the measurement, the measurement shall be taken to the lowest elevation of the drilling mud solids unless the impoundment is filled with dried drilling mud above the berms in all areas of the impoundment (excluding drainage channels at the edges of the impoundment).

the waste is not exceeded (i.e., liquid is not free draining)<sup>3</sup>. Any “top water”, rainfall, or contact storm water must be immediately removed from the impoundment and placed in an active Class II surface impoundment with a freeboard exceeding the required freeboard level.

5. The Discharger shall **immediately** notify Central Valley Water Board staff by telephone and email and **immediately** take measures to regain surface impoundment capacity in the event that freeboard levels are not in compliance with Facility Specification C.2 or C.3, above.
6. The Discharger shall record onsite rainfall to track the magnitude of storm events and shall record surface impoundment freeboard levels in accordance with the attached MRP R5-2014-XXXX.
7. Leachate removed from a surface impoundment’s primary LCRS shall be discharged to the impoundment from which it originated, or to another active Class II surface impoundment.
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.
9. Contact storm water runoff from basins that are filled with drilling mud above the grade of the berms shall be directed either back into the basin if required freeboard exists or to an adjacent double-lined Class II surface impoundment. Storm water from areas with interim cover (if installed) or final cover can be directed to the site’s storm water drainage system.
10. 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 a calculated ALR by this method as part of its design. 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

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<sup>3</sup> Section 20200(d) of Title 27

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.

11. Leachate volumes pumped from the LCRS sumps of all double-lined Class II surface impoundments shall be measured, recorded, and reported in the semi-annual monitoring reports, as required by the MRP, in order to track leakage rates.

12. If monitoring of the suction 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 R5-2014-XXXX.
- 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.

13. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs dated November 2013.

#### **D. DESIGN AND CONSTRUCTION SPECIFICATIONS**

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. Waste management units shall be designed, constructed and operated to prevent inundation or washout due to flooding events with a 100-year return period.
3. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over their operating life.
4. Materials used to construct LCRSs shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the surface impoundments and the post-closure maintenance period.

5. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by each surface impoundment and to prevent the buildup of hydraulic head on the underlying liner at any time. The LCRS pump shall be capable of removing this volume of leachate and/or 150% of the Action Leakage Rate flow, whichever is greater.
6. The Discharger shall submit a design report including plans, specifications, and a construction quality assurance plan for review and approval **90 days** prior to constructing any new lined waste management unit or closure of waste management units.
7. The Discharger shall submit a final report documenting construction of any newly lined waste management unit for review and approval at least **60 days** prior to discharging wastes to the waste management unit. The final report shall include the results of an electrical leak location survey (unless such a survey is infeasible without adding water to the LCRS layer) and documentation of any repairs.

### **Class II Surface Impoundment Design**

8. New Class II surface impoundment liner systems shall consist of, 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  $5 \times 10^{-7}$  cm/s.
9. Double-lined Class II surface impoundments that will require equipment to work inside of them for processing of drilling mud shall have a two foot soil operations layer with a colored (e.g., orange, yellow) geotextile at the midway point. 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.
10. Double-lined Class II surface impoundments shall have an LCRS sump to collect and return leachate to the impoundment that leaks through the primary liner.
11. Double-lined Class II surface impoundments shall be equipped with an access to the LCRS drainage layer for required annual testing of the LCRS per the SPRRs.

12. 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 the MRP.
13. Double-lined Class II surface impoundments shall have an unsaturated zone monitoring system beneath the sump area of the impoundment.
14. Active double-lined Class II surface impoundments shall have permanent markings on the liner, or a permanent freeboard gauge so that the freeboard can be observed and recorded at any time. The markings or gauge shall have increments no greater than 6-inches.
15. The Discharger shall include as part of design, the financial assurance requirements for new or retrofitted Class II surface impoundments in Financial Assurance Specification F.4.
16. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs dated November 2013.
17. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs dated November 2013.

#### **E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS**

1. At closure of the Class II surface impoundments, the Discharger shall either clean close the impoundment pursuant to Title 27 section 21400(b)(1), or close the impoundment as a landfill pursuant to Title 27 section 21400(b)(2)(A). Closure shall be conducted as required by this Order, as proposed in the Preliminary Closure Plan and Final Closure Plan approved by Central Valley Water Board staff.
2. 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.
3. The approved final cover for Class II surface impoundments closed as a landfill shall consist of, from top to bottom, the following:
  - a. A one-foot erosion-resistant soil layer containing no waste and covered with grass vegetation. The type of grass vegetation shall be proposed in the closure plan.

- b. A geocomposite drainage layer to drain rainwater that percolates through the erosion-resistant soil layer laterally to the edge of (and away from) the unit.
  - c. A one-foot soil layer compacted to a minimum 90 percent of maximum relative dry density and with maximum hydraulic conductivity of  $1 \times 10^{-6}$  cm/s.
  - d. A two foot thick foundation layer compacted to a minimum 90 percent of maximum relative dry density that may contain dried drilling mud.
4. Class II surface impoundments closed as landfills shall have external side slopes with maximum steepness of 4H:1V and the top deck shall have a minimum 3% slope for drainage.
  5. Prior to closure of surface impoundments to be closed as landfills, the Discharger shall submit a Final Closure and Post-Closure Maintenance Plan prepared by a California-registered civil engineer or certified engineering geologist, and that contains all applicable information required in Title 27 section 21769. The plan shall include any closure/post-closure elements proposed in the 14 February 2014 ROWD (including a stability analysis for the closed unit), and shall meet the requirements of this Order.
  6. During the closure and post-closure maintenance period, the Discharger shall conduct routine maintenance of final covers and areas with interim cover; continue to operate the LCRS; maintain the precipitation and drainage control facilities; maintain the groundwater and unsaturated zone monitoring facilities; and operate/maintain any facilities associated with corrective action.
  7. The Discharger shall, in a timely manner, repair any areas of the final cover that have been damaged by erosion, cracking, settlement, subsidence or any other causes that could allow ponding of surface water or percolation of surface water into the wastes.
  8. Prior to and during the rainy season, the Discharger shall perform any and all necessary reseeding of the interim and final cover to maintain adequate vegetation.
  9. The Discharger shall perform all post-closure maintenance activities specified in the facility's Final Closure and Post-Closure Maintenance Plan that are not specifically referred to in this Order.
  10. 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 pursuant to Title 27 section 21180(a) and Title 27 section 21900(a).
  11. The Discharger shall comply with all Closure and Post-Closure Maintenance Specifications listed in Section F of the SPRRs dated November 2013.

## F. FINANCIAL ASSURANCE

1. **For Closure:** Pursuant to Title 27 section 22207, the Discharger shall submit an annual report by **1 June** of each year showing that it has provided the required minimum annual deposit for financial assurance for closure into a fund naming the Central Valley Water Board as beneficiary to ensure closure of the Class II surface impoundments in accordance with the approved cost estimates in the amended ROWD. The deposit shall be added to the closure financial assurance funds already in place. The financial assurances mechanism or fund shall be one that is listed in Title 27 Section 22228 for which the Discharger is eligible. The minimum annual deposit into the closure fund 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 required in F.5., below.
2. **For Post-Closure Maintenance:** Pursuant to Title 27 sections 22211 and 22212, the Discharger shall submit an annual report by **1 June** of each year showing that it has provided the required minimum annual deposit for financial assurance for post-closure maintenance into a fund naming the Central Valley Water Board as beneficiary to ensure post-closure maintenance of the Class II surface impoundments in accordance with the approved cost estimates in the amended ROWD. The deposit shall be added to the post-closure financial assurance funds already in place. The financial assurances mechanism or fund shall be one that is listed in Title 27 Section 22228 for which the Discharger is eligible. The minimum annual deposit into the post-closure maintenance fund shall be in accordance with Title 27 section 22225(a)(2)(B), plus inflation adjustments required in F.5., below.
3. **For Corrective Action:** Pursuant to Title 27 Section 22222, the Discharger shall submit an annual report by **1 June** of each year showing that it has provided the required minimum annual deposit for financial assurance for corrective action into a fund naming the Central Valley Water Board as beneficiary to address a known or reasonably foreseeable release from the Class II surface impoundments in accordance with the approved cost estimate in the amended ROWD. As proposed in the amended ROWD, the Discharger shall provide an initial deposit of \$32,400 by **1 June 2015**, and minimum annual deposits by 1 June of each year into the corrective action fund in accordance with Title 27 section 22226 such that it is fully funded by **1 June 2020**. The financial assurances mechanism shall be one listed in Title 27 Section 22228 for which the Discharger is eligible. The Discharger shall also provide the annual inflation adjustments required in F.5., below.
4. The closure and post-closure financial assurances shall be updated to account for any new or retrofitted Class II surface impoundments. Proposed closure and post-closure cost estimates for any new or retrofit surface impoundments shall be submitted as part of updated Closure and Post-closure Maintenance Plans which shall be submitted together with design documents for that impoundment, including a proposed payment schedule for mechanisms requiring funding. The closure and post-closure cost

estimates and funding mechanisms shall be established by a date in accordance with a payment schedule approved as part of the review and approval of the design documents.

5. By **1 June of each year**, the Discharger shall submit an annual report to the Central Valley Water Board that reports the balance of the closure, post-closure maintenance, and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27 Section 22236. The report shall also show that the Discharger has funded the financial assurance mechanisms in accordance with the required minimum annual deposits for establishing closure, post-closure maintenance, and corrective action financial assurances. The report shall include 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(a)(1) that is used in the calculations. The annual report shall be a single report that provides the required financial assurances information pursuant to Financial Assurance specifications F.1 through F.3, above.
6. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated November 2013.

## **G. MONITORING SPECIFICATIONS**

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program (MRP) No. R5-2014-XXXX, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated November 2013.
2. The Discharger shall, for any waste management unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP R5-2014-XXXX, and the Standard Monitoring Specifications listed in Section I of SPRRs dated November 2013.
3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP R5-2014-XXXX, and the SPRRs dated November 2013.
4. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP R5-2014-XXXX.
5. For each monitoring event, the Discharger shall determine whether the waste management unit is in compliance with the Water Quality Protection Standard using procedures specified in MRP R5-2014-XXXX and the Standard Monitoring Specifications in Section I of the SPRRs dated November 2013.

6. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated November 2013.

## **H. PROVISIONS**

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements, dated November 2013, which are attached hereto and made part of this Order by reference. The Standard Provisions and Reporting Requirements contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.
2. Pursuant to Water Code section 13267, the Discharger shall comply with MRP R5-2014-XXXX, which is attached to and made part of this Order. This compliance includes, but is not limited to, maintenance of waste containment facilities and precipitation and drainage controls and monitoring groundwater, the unsaturated zone, and surface waters throughout the active life of the waste management units and any applicable post-closure maintenance period. A violation of MRP R5-2014-XXXX is a violation of these waste discharge requirements.
3. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
4. The Discharger shall maintain legible records of the volume and type of waste discharged to the surface impoundments and the manner and location of the discharge. Such records shall be maintained at the facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the Central Valley Water Board and of the State Water Resources Control Board, copies of these records shall be sent to the Central Valley Water Board upon request.
5. The Discharger shall comply with all applicable provisions of Title 27 that are not specifically referred to in this Order.
6. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order and of the California Water Code.
7. The Discharger shall immediately notify the Central Valley Water Board of any flooding, equipment failure, slope 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. In the event of any change in control or ownership of the facility or disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. 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 paragraph of General Provision K.2.e in the Standard Provisions and Reporting Requirements 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 California Water Code. Transfer shall be approved or disapproved by the Executive Officer.
9. The Discharger shall provide proof to the Central Valley Water Board **within sixty days after completing final closure of all basins at the facility** that the deed to the facility property, or some other instrument that is normally examined during title search, has been modified to include, in perpetuity, a notation to any potential purchaser of the property stating that:
  - a. The parcel has been used for disposal of wastes.
  - b. Land use options for the parcel are restricted in accordance with post-closure land uses set forth in any post-closure plan (if applicable).
  - c. In the event that the Discharger defaults on carrying out either any corrective action needed to address a release, groundwater monitoring, or any post-closure maintenance (if applicable), then the responsibility for carrying out such work falls to the property owner.
10. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
11. The following reports shall be submitted pursuant to Water Code section 13267 and shall be prepared by a California-registered civil engineer or certified engineering geologist:

<u>Task</u>	<u>Compliance Date</u>
<b>A. Construction Plans</b>  Submit construction and design plans for review and approval. (see all Construction Specifications in Section D and E, above and Section F of the SPRRs.)	<b>At least 90 days prior to proposed construction</b>
<b>B. Construction Report</b>  Submit a construction report for review and approval upon completion demonstrating construction was in accordance with approved construction plans (see Standard Construction Specifications in Section F of the SPRRs).	<b>At least 60 days prior to proposed discharge</b>
<b>C. Truck Washout Basin Upgrade Work Plan</b>  Submit a work plan to clean close the existing truck washout basin and to install a new steel tank washout containment area as proposed in the February 2014 ROWD and as described in this Order.	<b>15 September 2014</b>
<b>D. Submit Evaluation Monitoring Program Results</b>  Submit Evaluation Monitoring Program/Site Investigation results report with the results of the site investigation from an approved work plan to investigate the extent of the salt-impacted groundwater. The report shall include the items listed in sections 3.a-3.g of the 27 December 2013 Central Valley Water Board staff letter.	<b>15 March 2015</b>
<b>E. Submit Engineering Feasibility Study</b>  Submit an Engineering Feasibility Study (EFS) that evaluates the options to achieve background concentrations in groundwater at the downgradient portion of the site and that proposes to implement the recommended corrective action. The report shall include the items listed in sections 4.a-4.f of the 27 December 2013 Central Valley Water Board staff letter.	<b>1 July 2015</b>

**F. Final Report for New Truck Washout**

**1 October 2015**

Submit a final report documenting that clean closure and upgrade of the truck washout basin has been completed in accordance with the approved work plan.

**G. Submit Corrective Action Upgrade Results**

**31 December 2015**

Submit a report documenting that the upgraded corrective action measures, as approved by Central Valley Water Board staff, have been implemented.

**H. Final Report for Clean Closure of Basin 8**

**2 November 2016**

Submit a final report documenting that Basin 8 has been clean closed in accordance with the requirements of this Order, including removal of all drilling mud, the clay liner, and at least two feet of surrounding natural geologic materials.

12. In the event of any change in ownership of this 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.
13. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.
14. This Order shall take effect upon the date of adoption.
15. The Discharger shall comply with all General Provisions listed in Section K of the SPRRs dated November 2013.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on \_\_\_\_\_.

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PAMELA C. CREEDON, Executive Officer

WLB