

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2016-XXXX

WASTE DISCHARGE REQUIREMENTS
FOR
MERIDIAN BEARTRACK CO.
MERIDIAN GOLD COMPANY
ROYAL MOUNTAIN KING MINE
CALAVERAS COUNTY

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

1. Meridian Beartrack Co. (MBC) and Meridian Gold Company (hereafter jointly Discharger), with landowner Felix Mining Company, operated the Royal Mountain King Mine (hereafter RMKM or facility or site) in Calaveras County. MBC now owns all of the property that comprises RMKM. MBC purchased the property owned by Felix Mining Company by Deed recorded on November 4, 2011 and acquired the property owned by Patricia McCarty through a lot line adjustment and Deed recorded on December 29, 2010. The Board regulates mining activities, including the closure of mine sites, pursuant to the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) and regulations in California Code of Regulations, title 27, section 22470 et seq. (Title 27).
2. Mining activities at RMKM were originally regulated by Waste Discharge Requirements (WDRs) Order 88-176, which addressed the removal, transport, processing, and disposal of mined material. Since mining ceased, the Board has issued three WDRs for the closure of this site: WDRs Orders 97-165, 5-01-040, and R5-2008-0021. This Order supersedes all prior WDRs Orders.
3. The following documents are attached to this Order and hereby incorporated into and made a part of this Order by reference:
 - a. Attachment A – Site Location Map
 - b. Attachment B – Site Plan
 - c. Attachment C – De-designation and Variance Area
 - d. Attachment D – Fault Zones
 - e. Attachment E – June 2015 Groundwater Contours
 - f. Attachment F – Groundwater Monitoring Network
 - g. Attachment G – Surface Water Monitoring Network
4. The following acronyms are used throughout this Order:

BPA	Basin Plan Amendment
FTR	Flotation Tailings Reservoir
LCRF	Leached Concentrate Residues Disposal Facility
LCRS	Leachate Collection and Removal System
ODS	Overburden Disposal Site
PWP	Process Water Retention Pond

TDS Total Dissolved Solids
 WMU Waste Management Unit

5. RMKM comprises approximately 2,100 acres west of Highway 4 and south of Rock Creek Road near the town of Copperopolis, Calaveras County, in Sections 18, 19, 20, 24, 29, 30, and 32, T2N, R12E, MDB&M, as shown in Attachment A.
6. The facility includes the Assessor's Parcel Numbers (APNs) listed in the table below. The approximate property boundary is shown on Attachment B.

Land Owner	APN Number	Description
Meridian Beartrack Co.	053-411-016, 053-411-015, 053-411-014, 053-411-013, 053-411-002, 053-310-004, 053-012-008, 053-012-004, 053-012-001, 053-011-025, 053-011-018, 053-010-008, 053-101-007, 053-010-005, 053-010-004, 053-010-003, 053-010-002, 053-010-001, 053-009-008, 053-009-007, 053-009-006, 053-009-004, 053-009-003, 053-009-001, 050-431-004, 050-031-029, 050-031-018, 050-031-010, 053-322-003, 053-011-032, 053-322-002, 053-011-016, 053-011-033, 053-022-004, 053-011-034, 54-014-01 53-011-23, 53-011-24 050-031-011, 053-010-006 053-011-035, 053-011-037 053-011-038, 053-011-040 053-022-005, 53-011-03	All of the WMUs

7. The Discharger operated the facility for the mining and extraction of gold. Active mining began in March 1989 and ceased in June 1994. Ore was mined from a series of open pits (North, Skyrocket, and Gold Knoll) and milled at approximately 3,400 tons per day. Skyrocket Pit and North Pit were actively dewatered during mining and have filled with groundwater and runoff/precipitation since mining stopped. The Gold Knoll Pit was backfilled and has been covered by the Gold Knoll ODS. Currently, Skyrocket Pit is classified as an active WMU for the transfer of ODS seep water to Skyrocket Pit. Mining facilities consisted of three open pits, a mill, a Flotation Tailings Reservoir (FTR), a Leached Concentrate Residues Facility (LCRF), a Process Water Retention Pond (PWP), and three ODSs (FTR, West, and Gold Knoll). The Discharger also constructed a cyanide heap leach facility within the LCRF to process low-grade oxide ore. Attachment B shows the locations of these units. The general constituents of concern in the waste and

wastewater are dependent on the specific WMU and consist of acid (indicated by low pH), cyanide, arsenic, total dissolved solids (TDS), chloride, nitrate, selenium, and sulfate.

8. On 8 July 2015, the Discharger submitted a Report of Waste Discharge (ROWD). The information in the ROWD has been used in developing this Order. The ROWD and supporting documents contain information related to this revision of the WDRs including:
 - a. Classification of the FTR and ODSs as Group C Mining Waste following State Water Board adoption of the Basin Plan Amendment (BPA) and a site specific modification to the Sources of Drinking Water Policy in January 2015.
 - b. Implementation of Skyrocket Pit water management strategies.
 - c. Classification of the North Pit as a Group C WMU for transfer of water from Skyrocket Pit during emergency situations.
 - d. Closure of the ODSs.
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 this Order, below, and in the Standard Provisions and Reporting Requirements, dated April 2016 (SPRRs) Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2016-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 “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 this Order, and the requirement in the WDRs supersedes the requirement in the SPRRs.

REGULATORY HISTORY

10. The Discharger was originally regulated by WDRs Order 88-176, which addressed the removal, transport, processing, and disposal of mined material. Subsequent WDRs through 2001 dealt with changes in individual units or operations.
11. WDRs Order 97-165 and all prior orders classified the mining wastes deposited in the West, Gold Knoll, and Flotation Tailings Reservoir overburden disposal sites (ODSs) as Group C mining waste. However, on 15 March 2001, the Central Valley Water Board issued WDRs Order 5-01-040 and a companion Cease and Desist Order 5-01-041 (the “CDO”, which was subsequently revised). In issuing these orders, the Board reclassified the mining wastes in the ODSs as Group B mining waste, thereby subjecting these wastes to much more stringent closure criteria. The Board’s re-classification of the mining wastes reflected a regulatory shift that placed a greater emphasis on the enforcement of secondary maximum contaminant levels (secondary MCLs), which are regulatory limits established to protect the odor, taste, and appearance of drinking water. Before this shift, mining wastes that threatened to cause exceedances of secondary MCLs could still be classified as Group C wastes, as long as the wastes did not threaten

to impact human health-based regulatory limits. Because evidence in the Board's files indicated that groundwater passing through the ODSs showed increases in TDS, sulfate, and other inorganic salts, the Board concluded that the ODSs could contribute to exceedances of secondary MCLs in the underlying groundwater, and therefore applied regulatory standards based on the Group B classification criteria.

12. Subsequent to the Central Valley Water Board's issuance of WDRs Order 5-01-040 and the CDO, MBC petitioned the Central Valley Water Board's actions to the State Water Resources Control Board (State Water Board). In the petition, MBC alleged, *inter alia*, that the Board's reclassification was unwarranted, due to the fact that the underlying groundwater was naturally poor and should not be expected to be used as a source of drinking water. Therefore, MBC argued that subjecting the ODSs to the prescriptive standards of Title 27 that apply to Group B wastes was unreasonable and legally inappropriate.
13. On 20 May 2004, the State Water Board issued Water Quality Order 2004-0007 (*Remand Order*). In the *Remand Order*, the State Water Board agreed with MBC on their argument that subjecting the ODSs to the prescriptive standards of Title 27 was unreasonable. The *Remand Order* therefore vacated the CDO and remanded the matter to the Central Valley Water Board for reconsideration, directing the Central Valley Water Board to seek "alternate means of complying with applicable legal requirements for mine closure and cleanup." Among the "alternate means" suggested by the State Water Board were options that would result in the classification of the FTR liquids and ODSs as Group C mining waste, such as de-designation of beneficial uses, or the establishment of a "containment zone" in an enforcement order, or the establishment of enhanced and expanded wetland and riparian areas in lieu of the installation of a clay cover.
14. In response to the *Remand Order*, the Central Valley Water Board investigated all potential regulatory options for the closure of the RMKM Site, and concluded that the de-designation of the underlying groundwater beneficial uses would be appropriate to facilitate the orderly and efficient closure of the RMKM Site.
15. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition, revised June 2015 (Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. Pursuant to Water Code section 13263, subdivision (a), waste discharge requirements must implement the Basin Plan. The beneficial uses of groundwater underlying RMKM as set forth in the Basin Plan prior to 2015 were municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND) and industrial process supply (PRO). The Basin Plan's narrative water quality objectives for chemical constituents, at a minimum, require waters designated as MUN to meet the MCLs specified in Title 22 of the California Code of Regulations, including the secondary MCLs.

16. On 28 March 2014, the Central Valley Water Board adopted a BPA that de-designated the MUN and AGR beneficial uses of the groundwater underlying much of the RMKM Site. The BPA also modified Basin Plan Chapter IV (Implementation, under the heading "Control Action Considerations of the Central Valley Regional Water Board") to add a policy for managing poor-quality groundwater and added a variance for TDS, arsenic, chloride, nitrate, selenium, and sulfate in groundwater for IND and PRO beneficial uses at the RMKM Site. Attachment C shows the groundwater de-designation and variance area.
17. The State Water Board's Resolution 88-63 (*Sources of Drinking Water Policy*) articulates a state policy that all waters should be presumptively considered a source of drinking water (i.e., designated as MUN), subject to limited exemptions. The Central Valley Water Board's BPA did not fit within the narrow exemption criteria contained in the *Sources of Drinking Water Policy*. However, on 20 January 2015, following the Central Valley Water Board's adoption of the BPA, the State Water Board adopted resolutions that approved the Central Valley Water Board's BPA and that made a site-specific modification to the *Sources of Drinking Water Policy* to resolve the inconsistency between the *Sources of Drinking Water Policy* and the Central Valley Water Board's the BPA.
18. Consistent with the Central Valley Water Board's BPA, this Order classifies the FTR liquid and ODSs as Group C mining wastes. This designation could change at a later time if monitoring conducted pursuant to this Order reveals unreasonable degradation of groundwater quality downgradient of the of the de-designation area (Attachment C) by constituents from the ODSs, Skyrocket Pit, or the North Pit, or if the Discharger cannot effectively prohibit mining impacted water from entering surface waters except in accordance with the terms of the NPDES Permit. In this event, the Board may consider imposing other regulatory requirements, such as those that would reclassify the ODS seeps, Skyrocket Pit, and/or the North Pit and subject them to more stringent remedial requirements. Such action by the Central Valley Water Board will only be undertaken after the Discharger has been allowed to conduct the required regulatory investigation and corrective action process, and only after the Central Valley Water Board finds that the Discharger is failing to address the impacts within a reasonable period of time.
19. NPDES permit Order R5-2007-0162 was issued by the Central Valley Water Board on 6 December 2007. A revised NPDES permit was issued on 31 May 2013 in Order R5-2013-0071. The NPDES permit authorizes controlled discharges of water from Skyrocket Pit to Littlejohns Creek during periods of high seasonal creek flow. The purpose of the discharge is to allow management of the site-wide water balance and to control Skyrocket Pit water levels without causing detrimental impacts to beneficial uses in the downstream surface waters.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

20. The Discharger proposes to continue to transfer mine impacted FTR Leachate Collection and Removal Systems (LCRS) water and ODS seep water to Skyrocket Pit at the facility. Additionally, during emergency situations, the Discharger proposes to pump water from Skyrocket Pit to the North Pit to prevent the overtopping of Skyrocket Pit when sufficient

discharge from Skyrocket Pit is not allowed under conditions imposed by the NPDES permit. These classified wastes may be transferred only in accordance with Title 27. The remaining WMUs shall remain closed and are not authorized by this Order to receive any additional waste materials.

21. RMKM consists of eight WMUs classified as containing either a Group A, B, or C mining waste. The following are the definition of these waste classifications per Title 27, section 22480:

Group A – mining wastes of Group A are wastes that must be managed as hazardous waste pursuant to Chapter 11 of Division 4.5, of Title 22 of this code, provided the RWQCB finds that such mining wastes pose a significant threat to water quality;

Group B – mining waste of Group B is either:

- a. mining wastes that consist of or contain hazardous wastes, that qualify for a variance under Chapter 11 of Division 4.5, of Title 22 of this code, provided that the RWQCB finds that such mining wastes pose a low risk to water quality; or
- b. mining wastes that consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives for, or could cause, degradation of waters of the state; or

Group C — mining wastes from Group C are wastes from which any discharge would be in compliance with the applicable water quality control plan, including water quality objectives other than turbidity.

22. The existing WMUs authorized by this Order are described as follows:

WMU (Size)	Liner/LCRS ¹ Components ²	Waste Classification – Description	Status
Flotation Tailings Reservoir (FTR) (150 acres)	Final Cover: 6-inch thick vegetative soil cover. Tailings ($k \leq 1 \times 10^{-5}$ cm/sec) LCRS: Geotextile, crushed rock, and perforated 4-inch drain pipes Base Liner System: South area: 2-foot thick compacted clay ($k \leq 8 \times 10^{-7}$ cm/sec), North area: 1-foot thick compacted clay ($k \leq 8 \times 10^{-8}$ cm/sec), spine and spring drains	Group C Solids and Group C Liquid – 6.5 million tons of flotation tailings. The solids were classified as Group C mining waste based on the lack of acid generation. The liquid contains salts and metals and was reclassified as Group C.	Closed

WMU (Size)	Liner/LCRS ¹ Components ²	Waste Classification – Description	Status
<p>Leached Concentrate Residues Facility (LCRF) (18 acres)</p>	<p>Final Cover: 6-inch thick vegetative soil cover, one-foot thick FTR tailings layer, a geocomposite drainage layer, 60-mil HDPE geomembrane, foundation layer.</p> <p>LCRS: geotextile, 1-foot thick gravel, perforated drain pipes, geotextile</p> <p>Base Liner System: 40-mil, very low density polyethylene (VLDPE) geomembrane, 2-feet thick compacted clay ($k \leq 8 \times 10^{-6}$ cm/sec), spine drains</p>	<p>Group B Liquid – 186,400 tons of leachate concentrate residue containing cyanide, salts and metals. The solids are classified as Group B based on the acid generation potential. The liquids are classified as Group B Based on the acid generating potential cyanide concentrations.</p>	<p>Closed</p>
<p>Process Water Retention Pond (PWP) (8 acres)</p>	<p>Evaporation Pond: 1.3 acre lined pond to evaporate PWP liquids.</p> <p>Final Cover: 1.5-foot thick vegetative soil cover, geocomposite, 60-mil HDPE, 2-feet thick foundation layer</p> <p>Base Liner System: 80-mil, high density polyethylene (HDPE) geomembrane, geotextile, 1-foot thick gravel LCRS, geotextile, 80-mil HDPE geomembrane, 2-feet of compacted clay, gravel trenches with 6-inch diameter pipes</p> <p>Side-Slope Liner System: 80-mil HDPE geomembrane, geotextile, HDPE drain net, 80-mil HDPE geomembrane, geotextile</p>	<p>Group C Solids and Group B Liquid – 39,000 cubic yards of flotation tailings from the LCRF.</p>	<p>Partially Closed</p> <p>The evaporation pond on the surface of the PWP remains active</p>
<p>Overburden Disposal Sites - Gold Knoll (60 acres), Western (125 acres), FTR (59 acres)</p>	<p>Final Cover: 6-inch thick vegetative cover soil ($k \leq 1 \times 10^{-5}$ cm/sec)</p> <p>Base Liner System: Unlined.</p>	<p>Group C Solid – 54 million tons of overburden soil and rock with elevated salts and metals.</p>	<p>Closed with active seep water management</p>
<p>Skyrocket Pit (52 acres) (6,000 acre-feet)</p>	<p>Unlined.</p>	<p>Group C - This WMU receives Group C liquids from the FTR LCRS and ODSs</p>	<p>Active</p>
<p>North Pit (23 acres) (1,400 acre-feet)</p>	<p>Unlined</p>	<p>Group C – This WMU receives Group C liquids from Skyrocket Pit during emergency situations only.</p>	<p>Active</p>

¹ LCRS – Leachate collection and removal system

² Liner systems are listed from top to bottom.

23. On 25 January 2008, the Central Valley Water Board issued Order R5-2008-0021 in which the WMUs at the facility were classified as Group B and C units. This Order continues to classify WMUs as Group B and C units in accordance with Title 27. However, the FTR liquid and ODSs that were classified as Group B units in WDR R5-2008-0021 are now classified as Group C units consistent with the WDRs prior to 2001, the *Remand Order*, and the 2014 BPA as detailed in Findings 11 through 18.
24. Flotation tailings solids stored in the FTR were classified as a Group C mining waste per Section 22480 of Title 27 based on a net neutralization potential of 179 tons of CaCO₃ equivalent per 1000 tons of ore, and the lack of any significant extractable substances using the deionized water waste extraction test.
25. Flotation tailings liquid in the FTR were classified and managed as a Group B mining waste, based on the presence and the potential presence of flotation reagents or their breakdown products, some heavy metals in the flotation tailings liquid, and elevated levels of TDS. All of these conditions indicated a potential threat to groundwater and surface water quality near the FTR. Subsequent FTR analytical testing data showed that the flotation reagents, their breakdown products, and heavy metals were no longer present in the FTR liquids. The *Remand Order* suggested that the FTR liquids could be classified as Group C due to the lack of these constituents in the FTR liquids and the natural background TDS concentrations in the vicinity of this facility. This Order classifies the FTR liquids as Group C consistent with the *Remand Order* and subsequent regulatory changes by the Central Valley Water Board and the State Water Board.
26. Liquid in the LCRF was previously classified as Group B mining waste per Title 27 based on expected pH and free cyanide concentrations. Leached concentrates (solids) stored in the LCRF were also classified as Group B mining waste per Title 27 based on an acid generating potential of 668 tons of CaCO₃ equivalent per 1000 tons of ore.
27. Liquid stored in the PWP was previously classified as Group A mining waste based on hazardous concentrations of copper and cyanide. The PWP contains 39,000 cubic yards of Group C flotation tailings excavated from the FTR. During the summer and fall of 1999, the Discharger completed an interim closure of the PWP, which consisted of evaporation of wastewater in the PWP to approximately 8 acre-feet, solidification of this remaining brine by placing flotation tailings into the PWP, and covering the solidified brine with an impervious liner to prevent contact between rainfall. Due to the removal of salt precipitate and dilution by rainfall, the waste contained in the PWP is now considered a Group B waste instead of a Group A waste. The concentrations of key constituents in this wastewater are below the California Hazardous Waste Criteria, and therefore it is appropriate to reclassify this waste as Group B.
28. Skyrocket Pit is a mine pit that has filled with groundwater, precipitation, and water from the FTR and ODSs. The ODS seeps contain elevated concentrations of sulfate, selenium, nitrate, and TDS relative to Skyrocket Pit (as shown below). Additional

transfers of FTR LCRS and ODS seep water into Skyrocket Pit may increase the concentrations of these constituents in Skyrocket Pit. Lastly, the North Pit is currently filled only with groundwater and surface water runoff, but could receive water from Skyrocket Pit in an emergency. Considering that the only beneficial uses that could be affected by discharges from the ODSs, Skyrocket Pit and the North Pit (should the North Pit ever be utilized as an emergency contingency) are the MUN and AGR beneficial uses, and considering that the Board has de-designated the MUN and AGR beneficial uses in the area described in Attachment C, all discharges from the ODSs, Skyrocket Pit and the North Pit are expected to be in compliance with the Basin Plan. Therefore, the ODS seeps are appropriately classified as Group C mine waste and Skyrocket Pit and the North Pit are appropriately classified as Group C WMUs.

If monitoring conducted pursuant to this Order reveals unreasonable degradation downgradient of the de-designation area (Attachment C) by constituents from the ODSs, Skyrocket Pit, or the North Pit, or if the Discharger cannot effectively prohibit impacted water from entering surface waters except in accordance with the terms of the NPDES Permit, the Board may consider imposing other regulatory requirements, such as those that would reclassify the ODS seeps, Skyrocket Pit, and/or the North Pit and subject them to more stringent remedial requirements. Such action by the Central Valley Water Board will only be undertaken after the Discharger has been allowed to conduct the required regulatory investigation and corrective action process, and only after the Central Valley Water Board finds that the Discharger is failing to address the impacts within a reasonable period of time.

Transfer Concentrations to Skyrocket Pit and Average Skyrocket Pit Concentrations

		Gold Knoll	West ODS2	West ODS5	Skyrocket Pit
Constituent	Units	2014-2015 Average	2014-2015 Average	2014-2015 Average	2014-2015 Average
TDS	mg/l	6,872	3,398	4,478	3,367
Sulfate	mg/l	4,178	1,980	2,032	1,560
Nitrate	mg/l	9	17	5	7
Selenium	ug/l	63	20	1	4

29. Since the previous 2008 WDRs were adopted, the Discharger has completed the following site activities:
 - a. Upgraded the Gold Knoll ODS seep collection system.
 - b. Began regular transfer of FTR LCRS water to Skyrocket Pit to control surface seepage on the FTR.
 - c. Completed Phase 1 closure of the PWP including installing the final cover and an evaporation pond.
 - d. Installed and is operating an approved diffuser discharge system for discharge of water from Skyrocket Pit to Littlejohns Creek in conformance with the NPDES permit for the Site.

SITE DESCRIPTION

30. The facility is located in Salt Spring Valley in the low rolling Sierra Nevada Foothill terrain. The valley and the low mountain ranges are trending northwest-southeast. Several surface water bodies are located within 1 mile of the facility. Littlejohns Creek and Underwood Creek originate in the hills to the east and flow through the facility as shown on Attachment B. These creeks have been diverted around Skyrocket Pit and through a diversion channel east of Skyrocket Pit. Gold Knoll Creek originates in the eastern mountain range, and flows through the southern end of the facility to drain into Littlejohns Creek. Clover Creek trends northwest-southwest along and through the western edge of the facility, and runs through a small reservoir called Clover Reservoir which is also shown on Attachment B. All creeks drain into the Flowers Reservoir located about a mile south from the southwestern edge of the facility. Salt Spring Valley Reservoir is located to the northwest.
31. Land uses and planned land uses within one mile of the facility, based on the Calaveras County General Plan Land Use Designations map, include agriculture preserve and future single family residential (5 acres minimum) to the north, future single family residential (5 acres minimum) to the south, agriculture preserve and future single family residential (5 acres minimum) to the east, and agriculture preserve and future single family residential (5 acres minimum) to the west.
32. There are 21 municipal, domestic, industrial, or agricultural groundwater supply wells that have been identified within one mile of the facility. Three of these 21 wells have been characterized as salt water bearing wells.
33. Royal Mountain King Mine is located in the western block of the Sierra Nevada foothills metamorphic belt. The gold deposit is hosted in Jurassic metasedimentary and metavolcanic rocks along a thrust fault. Geologic formations and faults at the facility are generally trending northwest-southeast. The generalized geology presented on Attachment D shows a greenstone belt on the east side of the facility, a fault zone that runs through the middle of the facility, and a phyllite zone on the west side of the facility. The greenstone belongs to the metavolcanic Copper Hill Volcanics, whereas Salt Springs Slate represents metamorphosed deep ocean deposits (phyllite). The fault zone is a lithologically mixed tectonic melange zone.
34. The Bear Mountains Fault Zone, consisting of the on Hodson Fault (west) and Littlejohns Fault (east) and related structures, passes through the facility and trends northwest-southeast. These faults generally separate the greenstone/greenschist rocks from the phyllites, creating a lithologically mixed zone in between. There has been no documented Holocene fault movement in the area. The fault zone includes mineralized rock that contains gold (as well as other minerals) and also sulfides that when oxidized, result in elevated dissolved TDS and sulfate concentrations in water.
35. Two general soil mapping units cover the site, based on the USDA-NCRS Soil Web map: Rock Outcrop-Henneke-Delpiedra, and Whiterock-Rock Outcrop-Auburn. Prevalent soil

types include Argonaut (Mollic Haploxeralf), Auburn (Lithic Haploxerept), Henneke (Lithic Argixeroll), (and Whiterock (Lithic Xerorthent). These soils are classified as silts and clayey silts with some sand and gravel. The soils are generally well to moderately well drained.

36. The different rock types associated with the different fault zones affect the water quality in these areas. For example, greenstone rocks have high magnesium and bicarbonate ratios, whereas phyllites show high sodium and chloride ratios. As noted by the name Salt Spring Valley, various natural salt springs associated with phyllite zone have been documented in this area and the presence of three naturally salt bearing wells within 1 mile of the facility indicates the presence of natural salty groundwater.
37. Large variability in water quality from one side of the faults to the other is associated with varying rock types. Before mining began in 1989, groundwater and surface water quality varied widely across the site. Good quality water (defined as "below all beneficial use criteria") to poor quality water was found west of Hodson Fault. To the east of the Hodson and Littlejohns Faults, water is of good quality; and between the faults groundwater varied from good to fair quality. Because there is a large variation in natural water quality, water quality evaluations from each well and surface water monitoring location are conducted relative to the geologic (rock type) position of the sampling point. Most of the groundwater and surface water comparisons are from one data period to another, showing change over time. Comparisons are made between pre-mining data (or early mining data) versus sampling results after mining up to present day. Because of the naturally varying water quality, "background" at most sampling points is considered to be pre-mining data.
38. Hydraulic conductivity tests show the phyllite rocks, generally west of the fault zone, have low hydraulic conductivity ranging from 2.3×10^{-4} to 3.1×10^{-7} centimeters per second (cm/s). The measured hydraulic conductivities of the fault zone bedrock underlying the WMUs in the fault zone range from 1.2×10^{-3} to 9.7×10^{-4} cm/s. The two measured hydraulic conductivities of bedrock within the greenstone area east of the fault zone are 6.4×10^{-4} and 2.5×10^{-8} cm/s.
39. Based on a site-specific seismic analysis, the controlling maximum credible earthquake (MCE) on the closest active fault is a moment of magnitude (Mw) event 8.0 along the San Andreas and Hayward faults approximately 87 miles from the facility. It is estimated that a MCE event would produce a peak ground acceleration of 0.17 g at the facility with a return period of 2,475 years.
40. The facility receives an average of 23.7 inches of precipitation per year as measured at the RMKM on-site Station. The mean pan evaporation is 76.5 inches per year as measured at the RMKM on-site Station. The 100-year wet season was calculated to be 58.0 inches based on data from the RMKM on-site Station.
41. The 100-year, 24-hour precipitation event for the facility is estimated to be 5.1 inches, based on the NOAA website, point precipitation frequency estimates.

42. The waste management facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Numbers 06009C0550E and 06009C0650E.

SURFACE WATER CONDITIONS

43. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
44. Surface water at the site is drained by Littlejohns Creek, Underwood Creek, and the most northeasterly tributary of Clover Creek. These surface waters drain to Flowers Reservoir, downstream of the site. Flowers Reservoir drains to Littlejohns Creek, which is a tributary to French Camp Slough, the San Joaquin River, and the Sacramento-San Joaquin Delta.
45. The designated beneficial uses of the San Joaquin River, as specified in the Basin Plan, are Municipal and Domestic Supply, Industrial Process Supply, Hydropower Generation; Agricultural Supply, Water Contact Recreation; Non-contact Water Recreation; Warm Freshwater Habitat; Cold Freshwater Habitat; Spawning, Reproduction, and/or Early Development; and Wildlife Habitat. The beneficial uses of the Sacramento-San Joaquin Delta are: Municipal and Domestic Supply; Agricultural Supply; Industrial Process Supply; Industrial Service Supply; Water Contact Recreation; Non-contact Water Recreation; Warm Freshwater Habitat; Cold Freshwater Habitat; Migration of Aquatic Organisms; Spawning, Reproduction, and/or Early Development; Wildlife Habitat; and Navigation.
46. Streams flowing through the property are intermittent to seasonal streams. Most flow occurs during or just after rainfall. During the late spring, summer, and fall limited stream flow occurs. Year round flow has been recorded in Littlejohns Diversion through sampling point SWM-10 to Flowers Reservoir. No flow occurs upstream of the facility from late spring through fall.
47. Prior to mining, upgradient surface water quality east of the fault zone was generally good with TDS concentrations ranging from 50 to 265 mg/L at SWM-1 and SWM-4. SWM-1 and SWM-4 are located on Littlejohns Creek and Underwood Creek, respectively. These TDS concentrations are well below the drinking water standard. There was no detectable arsenic, and very low to non-detect concentrations of various trace metals.
48. Prior to mining, surface water quality downstream and west of the fault zone varied greatly, depending on the sampling location and flow conditions at the time of flow, with better water quality during higher flow conditions.
49. SWM-2 is directly downgradient of the Skyrocket Pit on Littlejohns Creek. Pre-mining sampling performed at this location in 1987 and 1988 represents sampling of Littlejohns Creek during low rainfall seasons, and consequently concentrations of TDS and other constituents may have been higher than in a normal wet season. TDS concentrations reported ranged from 865 to 4,065 mg/L with one much higher detection of 15,150 mg/L, which may be an outlier, and metals concentrations were low. Sodium was the

predominant cation, while chloride and sulfate were the predominant anions, which is typical of groundwater in the fault zone and phyllite, suggesting that surface water quality can be also affected by rock type. Concentrations of sodium and chloride reported during this period were higher than sulfate, calcium and magnesium, which is typical of water associated with the phyllites. Because the next sampling event after 1988 was after Littlejohns Creek was diverted around Skyrocket Pit, no "normal" water year pre-mining samples were collected from Littlejohns Creek.

50. SWM-10 receives flows from the diverted Littlejohns and Underwood Creeks and a small drainage north of Gold Knoll ODS. The flows and constituent concentrations have changed since mining began. Based on monthly sampling results from 1990 to 1997, flows only occurred at SWM-10 from approximately December to May of each year during the period of mining (when the groundwater levels were lowered by dewatering of the pits). In 1990, when SWM-10 was first being sampled during pit dewatering before any significant surface discharges from the WMUs occurred, the TDS concentrations ranged from 52 to 363 mg/L and metal concentrations were low. It appears no significant dry season surface flow occurred in Littlejohns Creek Diversion until June 1998, when the Skyrocket Pit water level (after cessation of pit dewatering) reached 953 feet above MSL. According to the record, the Littlejohns Creek Diversion at SWM-10 flows increased in 2000 and the constituent concentrations increased. TDS averaged approximately 1,500 mg/L from 2000 to 2015, with a maximum concentration of 4,090 mg/L in 2009. Although concentrations have shown increasing trends in SWM-10, the concentrations are within the range of pre-mining concentrations recorded at SWM-2 and it is unclear if increasing concentrations could be attributed to impacts from WMUs or spring water that previously flowed from the mineralized fault zone where Skyrocket Pit was located before it was mined and dewatered.
51. The data shows that mining activities have altered surface water; however, the extent of the impact compared to pre-mining conditions cannot be conclusively determined due to the lack of sufficient pre-mining data, as concluded in the *Remand Order*.
52. This Order requires the Discharger to continue to capture all seeps and springs that are associated with flows from the WMUs. These seeps and springs are to be captured and managed so they are no longer a threat to water quality.

GROUNDWATER CONDITIONS

53. Groundwater generally flows to the south-southeast, along the topographic slope and the predominant fault and fracture direction. Cross faulting also occurs in the area allowing ground water movement to the southwest. The June 2015 groundwater contours are shown on Attachment E.
54. As presented in Findings 36 and 37, the facility contains three distinct geology-related groundwater zones, each of which is separated by faults. Attachment D shows the fault zones. East of the Littlejohns Fault, the groundwater is primarily in a greenstone formation. Between the Littlejohns Fault and the Hodson Fault to the west, groundwater

is in a mixture of greenstone and phyllite and the mineralization that occurs in this area. West of the Hodson Fault, groundwater is primarily in a phyllite formation. The following findings describe the groundwater geochemical differences between these three zones.

55. Wells constructed within the greenstone include: PZ-1, GWM-1, GWM-2, GWM-11, GWM-18/30, GWM-26, GWM-33, GWM-35A/B, GWM-36A/B, and GWM-37. Well logs from these individual wells show that they are drilled through greenstone for the entire length of the gravel pack and screen interval. Groundwater chemistry associated with the greenstone indicates the anions are generally higher in bicarbonate relative to sulfate and chloride. Magnesium and calcium are the major cations, with sodium being relatively insignificant.
56. Wells constructed within the phyllite include: GWM-10, GWM-19, GWM-20, GWM-31, and GWM-32. The well logs from these individual wells show that they are drilled through phyllite for the entire length of the gravel pack and screen interval. Groundwater chemistry associated with the phyllites is generally high in sodium, sulfate, and chloride when compared to bicarbonate, calcium and magnesium.
57. Wells constructed between the Hodson and Littlejohns Faults generally have a mixture of phyllite and greenstone in the borehole. The monitoring wells in this area include: GWM-3, GWM-4, GWM-6, GWM-15, GWM-16, and GWM-25. Again, the well rock type is based on well logs from these individual wells, which shows that they are drilled through greenstone and phyllite for the entire gravel pack and screen interval. Groundwater chemistry associated with these wells is generally high in calcium when compared to sodium. Bicarbonate is the dominant anion.
58. The following table shows the groundwater quality from the pre-mining period (i.e., years 1987 through 1989). The data shown is the maximum, minimum, and average concentration for the wells in each area, which is represented by its geologic location. The following wells are used for each geologic area: Greenstone wells are GWM-1, GWM-2, GWM-11, GWM-18/30, and GWM-26; Phyllite wells are GWM-10, GWM-19 and GWM-20; and Fault zone wells are GWM-3, GWM-4, GWM-6, GWM-15, GWM-16 and GWM-25.

Constituent	Units	Greenstone Wells			Phyllite Wells			Fault Zones Wells		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
pH	number	7.1	8.0	7.6	7.0	7.6	7.4	6.9	8.2	7.5
Specific Conductance	umhos/cm	220	640	385	1,230	19,900	10,111	352	2,130	650
Total Dissolved Solids	mg/l	110	402	257	844	14,100	7,654	150	1,330	442
Chloride	mg/l	6.6	31	15	118	5,010	2,422	4	381	25
Sulfate	mg/l	8.0	27	16	227	4,000	2,099	12	295	60
Calcium	mg/l	15	42	26	43	417	196	47	141	88
Magnesium	mg/l	16	58	34	13	126	51	25	33	30
Bicarbonate	mg/l	84	248	162	124	516	241	164	360	241

Constituent	Units	Greenstone Wells			Phyllite Wells			Fault Zones Wells		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Sodium	mg/l	5	22	10	225	4,780	2354	8	244	31

59. It is noted that groundwater concentrations within the phyllite area are highly variable. For example, the pre-mining phyllite monitoring wells in the above table have a TDS average concentration of 7,654 mg/l; however, monitoring well GWM-32, a phyllite well just west of two of the phyllite pre-mining wells, had a TDS concentration in 2015 of 402 mg/l.
60. Upgradient groundwater quality on the eastern side of RMKM is not well known, particularly east of the FTR ODS near Littlejohns and Underwood Creeks.
61. Groundwater has been affected by the mining operations. Increases in concentrations of TDS, sodium, calcium, bicarbonate, sulfate, nitrate, selenium, and arsenic have been observed in groundwater wells throughout the site. The Table below shows concentrations of TDS and sulfate from wells GWM-25, GWM-5, GWM-2, GWM-30, GWM-12, GWM-21, GWM-11, GWM-34, and PZ-4. The table shows that at some locations TDS and sulfate have increased by 2 to 60 times when compared to pre-mining or first monitored concentrations.

Well	Parameter	Pre-Mining (1987-1989 average)	Present (April 2014 - April 2015 average)
GWM-25	TDS (mg/L)	678	1,477
	Sulfate (mg/L)	122	667
GWM-5	TDS (mg/L)	270	514
	Sulfate (mg/L)	34	264
GWM-2	TDS (mg/L)	329	1,077
	Sulfate (mg/L)	16	445
GWM-30	TDS (mg/L)	339	2,867
	Sulfate (mg/L)	26	1,600
GWM-12	TDS (mg/L)	2,119	5,550
	Sulfate (mg/L)	452	1,820
GWM-21	TDS (mg/L)	1,667	5,257
	Sulfate (mg/L)	288	2,837
GWM-11	TDS (mg/L)	167	1,253
	Sulfate (mg/L)	9	567
Well	Parameter	First Monitored (2000 average)	Present (April 2014 - April 2015 average)
GWM-34	TDS (mg/L)	223	483
	Sulfate (mg/L)	17	183

Well	Parameter	Pre-Mining (1987-1989 average)	Present (April 2014 - April 2015 average)
PZ-4	TDS (mg/L)	778	2,347
	Sulfate (mg/L)	250	1,030

62. The data shows that mining activities have impacted groundwater; however, the localized impacts are within the BPA de-designation and variance area. Corrective action is not required when groundwater impacts remain within the BPA de-designation and variance area. If groundwater monitoring shows that measurably significant groundwater impacts from the Mining Units are migrating downgradient of the BPA de-designation and variance area, the Discharger shall follow the procedures detailed in the SPRR Section I Standard Monitoring Provisions and Section J Responding to a Release.

GROUNDWATER AND SURFACE WATER MONITORING

63. The existing groundwater monitoring network for the WMUs consists of detection monitoring wells (GWM-2, GWM-9, GWM-10, GWM-11, GWM-12, GWM-15, GWM-16, GWM-21, GWM-25, GWM-26, GWM-30R, GWM-31, GWM-32, GWM-34, GWM-37) and piezometers (FPZ-3, FPZ-4, FPZ-5, FPZ-6, FPZ-7A, PZ-1, and PZ-4) as shown in Attachment F and detailed in MRP R5-2016-XXXX. Groundwater seeps that are also monitored include Gold Knoll Seep, West ODS 2 and West ODS 5 as shown in Attachment F and detailed in MRP R5-2016-XXXX. Attachment E also shows historical groundwater monitoring locations.
64. At the time this Order was adopted, the Discharger's detection monitoring program for groundwater at the facility satisfied the requirements contained in Title 27.
65. The facility is exempt from unsaturated zone monitoring pursuant to Title 27, section 20415(d)(5)) because the facility received all permits necessary for construction and operation before 1991 and unsaturated zone monitoring would not provide meaningful data at this stage of closure.
66. The existing surface water monitoring network consists of eight surface water monitoring points (SWM-1, SWM-2, SWM-6, SWM-8, SWM-9, SWM-10, SWM-13, SWM-17, stock pond, love pond spring) as shown in Attachment G and detailed in MRP R5-2016-XXXX. Attachment G also shows historical surface water monitoring locations.
67. The Discharger submitted a Water Quality Protection Standard (WQPS) report in Appendix K of the Report of Waste Discharge dated July 2015 proposing statistical data analysis methods to calculate concentration limits for each monitored constituent in accordance with Title 27. The WQPS report proposed to use intrawell data analysis to calculate tolerance limits for the monitored constituents. The WQPS and approved data evaluation methods are included in MRP R5-2016-XXXX.

68. The historic groundwater and surface water monitoring program described above was developed to address the compliance requirements of these Closure WDRs taking into account the BPA and the historical monitoring results for this facility. Among other things, the monitoring program contains compliance wells, which are the only wells utilized to determine if a measurably significant increase in a constituent has occurred that triggers the Title 27 investigative and corrective action process. Other wells are included to monitor changes within the de-designation area.

DESIGN OF WASTE MANAGEMENT UNIT(S)

69. 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.
70. 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 §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.
71. Construction will proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.

Flotation Tailings Reservoir (FTR)

72. The FTR (also known as WMU #1) was constructed in an intermittent stream valley northeast of North Pit. The FTR was designed utilizing naturally occurring clay and fine-grained tailings as a bottom liner system. The southern portion of the FTR bottom liner system was constructed with 2-feet of clay with a maximum hydraulic conductivity of 8×10^{-7} cm/s. The northern portion of the FTR bottom liner system was constructed with 1-foot of clay with a maximum hydraulic conductivity of 8×10^{-8} cm/s.
73. Flotation tailings liquid within the FTR is collected by a LCRS. The LCRS overlies the bottom clay layer and is comprised of a network of perforated pipes in drain rock that is intended to minimize the hydraulic head on the outer liner. It was constructed with 4-inch diameter perforated drain pipe covered with crushed rock sized between 0.5 and 6-inches.

74. Above the LCRS the fined grained tailings consolidate and act as another barrier for liquid migration with a measured permeability of $\leq 1 \times 10^{-5}$ cm/sec. The FTR contains approximately 6.5 million tons of flotation tailings.
75. Groundwater and spring water beneath the FTR is managed by a series of drains described as Spine Drain 1, Spine Drain 2, and the Spring Drain. These drains were utilized during mining operations to maintain separation of groundwater from the outer clay liner. The Spine Drains consist of a network of interconnected trenches below the clay liner that contain perforated plastic pipe and gravel. The Spring Drain consists of a spring collection sump with a pipeline in a gravel filled trench conveying spring flow to the FTR drain collection sump. The FTR also has a foundation drain used to drain water from the foundation of the embankment. The foundation drain consists of vertical boreholes/wells constructed in the embankment foundation trench fitted with pipes that convey the collected water to the FTR drain collection sump.
76. The spine, spring, and foundation drains under the FTR were closed in October 1998 as a test to determine the effects of blocking the FTR drains on 1) groundwater conditions, 2) containment of the FTR and 3) Skyrocket Pit water level. According to the 08 July 2015 Report of Waste Discharge and the test results submitted periodically to the Water Board, closing the drains resulted in an inward gradient across the outer liner of the FTR (i.e., groundwater was flowing into the FTR and reporting to the LCRS drain). This Order allows the permanent closure of the spine, spring, and foundation drains underlying the FTR following written Executive Officer approval. See the Facility Specification C.5 for work plan submittal requirements.
77. Previous WDRs required leachate from the FTR be collected and transferred to Skyrocket Pit. In March 2003, the Discharger closed the LCRS to control the water balance in Skyrocket Pit. The LCRS was reopened during the third quarter of 2008 to remediate a surface seep that developed at the FTR because the FTR water levels had risen too high. This Order allows the Discharger to keep the LCRS drains closed as long as the liquids and groundwater does not seep to the surface as detailed in the Facility Specifications and monitored as specified in MRP R5-2016-XXXX.
78. The FTR was closed as a Group C mining waste management unit in 1997. Closure consisted of the following:
 - Regrading the surface to a minimum slope of one percent;
 - Placement of six inches of soil over the tailings, followed by revegetation;
 - Construction of ditches along the eastern edge of the FTR;
 - Construction of a permanent spillway through the embankment and swales connecting to the spillway to allow free drainage of surface water from the FTR;
 - Decertification of the dam as a jurisdictional structure by the Department of Water Resources' Division of Dam Safety; and
 - Continued discharge of leachate from the FTR's Leachate Collection Recovery System (LCRS) to Skyrocket Pit.

79. A stability analysis was completed for the FTR Dam on 8 March 2016. The stability analysis analyzes the FTR Dam under both static and dynamic conditions. The static stability analysis indicates a factor of safety of 1.52, which is greater than the factor of safety of 1.5 required by Title 27. The dynamic (seismic) stability was evaluated using a pseudo-static analysis with a peak ground acceleration of 0.17 g for the MCE. The pseudo-static analysis shows that the FTR Dam does not undergo deformation under dynamic conditions.

Leached Concentrate Residue Facility (WMU #2)

80. The 18-acre LCRF is divided into two portions, which together comprise the Group B waste management unit. Approximately 6 acres of the northern part of the facility encompasses the lined heap leach pile. The remaining 12-acre southern portion, separated by a liner system, impounds the leached concentrate residue (LCR).
81. The LCRF contains 186,400 tons of leached concentrate residue. The LCRF is lined with a two foot thick clay layer installed to a hydraulic conductivity of less than 1×10^{-6} cm/sec; a 40-mil Very Low Density Polyethylene (VLDPE) liner; and geotextile layer as a filter layer over the underlying clay.
82. Liquids generated from the LCRF are collected by a LCRS system constructed with a one-foot thick layer of gravel between two geotextiles and a network of perforated pipes. The LCRF LCRS drains to the lower Process Water Pond (PWP) and is evaporated.
83. Since early 2007, leachate flowed out of the unit and into the LCRS at a rate of approximately 0.03 gpm, as reported by the Discharger's Site Supervisor. This value falls within the range of levels defined as negligible. The most recent ROWD proposes to abandon the LCRS by pumping grout in the LCRS pipe system. However, plugging of the LCRS is not acceptable since the drainage will back-up into the waste and cause a head on the liner. This will increase the leakage rate from the unit, causing an impact or threatening to impact groundwater and surface water. Therefore, this Order requires that the Discharger continue to collect and properly dispose of leachate collected in the LCRS.
84. The Discharger was granted final closure for the LCRF in a letter dated 28 July 2005. Closure consists of (from top to bottom) a 6-inch thick vegetative soil cover, a one-foot thick FTR tailings layer, a geocomposite drainage layer, and a foundation layer. Surface water runoff drains from northeast to southwest to a concrete-lined ditch along the western perimeter of the LCRF.

Process Water Pond (WMU #3)

85. The 8-acre PWP base liner system (from bottom to top) consists of a two foot thick layer of clay, a 150-mil geotextile, an 80-mil HDPE geomembrane, a 150-mil geotextile, a one foot thick layer of crushed and washed rock, a 150-mil geotextile, and an 80-mil HDPE geomembrane.

86. The sideslope liner system (from bottom to top) includes a 150-mil geotextile, an 80-mil HDPE geomembrane, and HDPE drain net, and an 80-mil HDPE geomembrane.
87. Liquids generated from the PWP are collected by a LCRS system constructed with a one-foot thick layer of gravel between two geotextiles and a network of perforated pipes.
88. The in-place closure of the PWP was constructed in 2008 as follows (from top to bottom):
 - A 1.5-ft thick erosion/vegetative layer that sustains vegetation and that will be hydroseeded with the seed mix approved for RMK;
 - A geocomposite drainage layer;
 - A 60-mil high-density polyethylene (HDPE) geomembrane that will serve as the low-hydraulic conductivity layer in accordance with Title 27, Section 21090(a)(2);
 - A foundation layer at least 2-ft thick; and
 - Soil fill as needed to reach the elevation of the base grading plan (i.e. the elevation of the bottom of the foundation layer)
89. During construction of the PWP final cover, a temporary 1.3-acre evaporation pond was constructed on top of the PWP lined with a 60-mil HDPE geomembrane that is separate from the PWP cover HDPE geomembrane. The temporary evaporation pond was constructed for management of the remaining liquid in the PWP waste mass. The liquid was removed using a sump system completed to the bottom of the encapsulated waste. The water was pumped to the evaporation pond where it evaporated. Water removal was terminated when the sump was not yielding enough water to allow removal.
90. Approximately 32,000 gallons of water were removed from the PWP during 2010. Water removal was stopped when the removal rate dropped below 0.1 gpm. The removal of the small amount of remaining water from the PWP waste solids is much slower. The most recent ROWD proposes to abandon the LCRS by pumping grout in the LCRS pipe system. However, plugging of the LCRS is not acceptable since the drainage will back-up into the waste and cause a head on the liner. This will increase the leakage rate from the unit, causing an impact or threatening to impact groundwater and surface water. Therefore, this Order requires that the Discharger continue to collect and properly dispose of leachate collected in the LCRS.
91. With the water not being removable at a significant rate and with infiltration prevented by the top cover, the potential for future accumulation or discharge of the liquids is negligible. Additionally, the liner system of the PWP is still in place and has been effective at containment. Thus, MBC recommends final closure of the PWP with the remaining liquid/soil matrix in place within the liner and cover containment systems.
92. The most recent ROWD proposes to remove the 1.3 acre evaporation pond by:
 - a. Cutting the geomembrane along the edge of the anchor trench along the crest of the pond slope.
 - b. Folding the geomembrane on the slope of the pond back over the bottom of the pond.

- c. Removing the geomembrane from the anchor trench and laying over the geomembrane at the bottom of the pond.
 - d. Placing 1.5 feet of soil cover over the geosynthetics.
93. This Order approves the closure of the PWP evaporation pond. Closure construction of the PWP evaporation pond will proceed only after all applicable design drawings and construction quality assurance plans have been approved by Executive Officer. Following removal of the PWP evaporation pond, remaining liquids collected from the PWP and LCRF LCRSs will need to be disposed of at an appropriate disposal facility. On-site disposal of these liquids are prohibited with the exception of within the PWP evaporation pond.

Overburden Disposal Units (General)

94. During operation of the mine, approximately 54 million tons of overburden were removed from the three pits and disposed in either the: (1) West ODS, (2) FTR ODS, or (3) Gold Knoll ODS.
- a. The FTR ODS is on the facility's eastern side with Littlejohns Creek flowing along its southeastern flank and the FTR on its northwestern side. This ODS received overburden waste rock from Skyrocket Pit and North Pit.
 - b. The Western ODS is on western edge of the facility, west of Skyrocket Pit, southwest of North Pit and north of Littlejohns Creek. This ODS covers a surface area of approximately 125 acres. A north-south canyon was filled in with overburden from North and Skyrocket Pits.
 - c. The Gold Knoll ODS is located in an area where mining initially occurred. Gold Knoll pit was filled with overburden from Skyrocket Pit. In addition, some surrounding land was also covered by overburden until the disposal area covered approximately 60 acres. The former pit filled with groundwater and storm water that came in direct contact with the waste rock.
95. Reclamation of each ODS was conducted during the mine operation period. The slopes were graded to natural looking slopes ranging from 2:1 to 3:1 (horizontal:vertical), covered with 6 inches of topsoil, fertilized and revegetated, and trees and shrubs were planted in irrigated trenches. In 1998, the covers of the West and Gold Knoll ODSs were enhanced by filling in swales, regrading the flat areas to a minimum two percent slope, placing a cover consisting of a minimum of four inches of compacted clayey topsoil over selected areas, replacing the topsoil layer, and revegetating. It is noted that the enhanced covers do not extend over the entire ODSs.
96. The Discharger conducted infiltration/permeability testing on the West and Gold Knoll ODSs in February 2000 in the areas where cover enhancements were performed. The testing procedure was a modified procedure developed by the U.S. Bureau of Reclamation. The Discharger concluded that the enhanced cover material has hydraulic conductivity about 1×10^{-5} cm/sec.

97. A stability analysis was completed for the FTR, West, and Gold Knoll ODSs on 8 March 2016. The stability analysis analyzes the FTR, West, and Gold Knoll ODSs under both static and dynamic conditions. The static stability analysis indicates a minimum factor of safety for each ODS of 1.84, 1.83, and 2.45, respectively, which is greater than the factor of safety of 1.5 required by Title 27. The dynamic (seismic) stability was evaluated using a pseudo-static analysis with a peak ground acceleration of 0.17 g for the MCE. The pseudo-static analysis shows that the FTR, West, and Gold Knoll ODSs do not undergo deformation under dynamic conditions.
98. Surface water and groundwater has been impacted by water percolating through the ODS waste. The Discharger submitted an Alternatives Analysis Report that indicated the most feasible approach to closure of the ODSs is to collect the captured flows at the toes of the ODSs, transfer these to Skyrocket Pit for seasonal storage, and release flows from the pit during high runoff periods into Littlejohns Creek under the NPDES permit for the Site. This Order requires ODS seeps to be collected to prevent mining impacted water from reaching waters of the US.
99. The *Remand Order* determined that placing a Title 27 prescriptive cover on the ODSs would not be effective in preventing groundwater from coming in contact with waste. This conclusion was based on the fact that a cover would not prevent any lateral or upward movement of groundwater through the waste. The *Remand Order* also stated that a cover preventing storm water from percolating through the waste would not substantially reduce the flow of the discharge or improve the water quality. This Order classifies the ODSs as closed with a minimum 6-inch thick, 1×10^{-5} cm/sec vegetative soil layer and the capture of ODSs seeps.

Skyrocket Pit

100. Skyrocket Pit was excavated during mining and allowed to fill with water when mining ceased. From September 1993, when the mining of Skyrocket Pit ceased, until April 1999, Skyrocket Pit was a hydraulic sink, drawing in poor quality groundwater from the west and good quality water from the east.
101. Skyrocket Pit is classified as a Group C mine WMU to allow the transfer of Group C water from the FTR LCRS and ODSs.
102. A Water Balance Model was prepared for Skyrocket Pit in the July 2015 ROWD. The Water Balance Model shows that the Skyrocket Pit water levels will not rise above 970 feet amsl. With the Skyrocket Dam, the spill elevation of Skyrocket Pit is 973 ft amsl. This Order requires Skyrocket Pit to maintain capacity for the 100-yr, 24-hr storm and 2-feet of freeboard. An updated Water Balance Model is required, per Provision H.15
103. A stability analysis was completed for the Skyrocket Pit Dam on 24 September 1996. The stability analysis analyzes the Skyrocket Pit Dam upstream and downstream slopes under varying saturation conditions for both static and dynamic conditions. The static stability analysis indicates a minimum factor of safety of 1.64, which is greater than the factor of

safety of 1.5 required by Title 27. The dynamic (seismic) stability was evaluated using a pseudo-static analysis with a peak ground acceleration of 0.15 g. The pseudo-static analysis factor of safety was calculated to be 1.16, which is greater than the minimum factor of safety of 1.15 for dams established by Seed (1979, *Giotechnique* 29, No.3, 215-163)

North Pit

104. The North Pit was excavated during mining and allowed to fill with water when mining ceased. Historically, the North Pit has not been classified as a WMU and, therefore, is primarily filled with groundwater and surface water. The North Pit has reached an equilibrium level of approximately 1030 feet MSL. The spill elevation of North Pit is 1070 ft amsl. North Pit is only being classified as a WMU based on its future potential contingent use as a waste management unit to which Skyrocket Pit water could be transferred in an emergency situation. Until that event occurs, the only compliance sampling required for North Pit is an annual grab sample for the parameters set forth in the Monitoring and Reporting Program. There are no groundwater wells in the current groundwater monitoring network that would make an appropriate Point of Compliance well for the North Pit. The closest downgradient well to the North Pit is GWM-30R. GWM-30R has been impacted from mining operations and is directly downgradient from the FTR making it difficult to discern water quality changes from the North Pit. If the mine impacted water from Skyrocket Pit is transferred to the North Pit, a new Point of Compliance may need to be identified for the North Pit. There will not be any requirement to "close" North Pit under Title 27 unless and until it receive wastes from Skyrocket Pit.

CLOSURE AND POST-CLOSURE MAINTENANCE

105. The Discharger included closure and post-closure monitoring and maintenance information in the July 2015 ROWD. As detailed in the Provisions, the Discharger shall submit a *Final Closure and Post-closure Maintenance Plan* for closure and post-closure maintenance of the WMUs. The plan shall include inspection, maintenance, and monitoring of the facility during the post-closure maintenance period, and include a post-closure maintenance cost estimate for the entire facility. Inspection and maintenance will include the condition of the final cover, drainage features, LCRS, groundwater monitoring wells, access roads, and site security. The plan will be implemented for a minimum period of 30 years or until the waste no longer poses a threat to public health and safety and the environment, whichever is greater.

FINANCIAL ASSURANCES

106. Title 27 section 22212 requires the Discharger to establish financial assurances for post-closure maintenance for 30 years. A cost estimate for post-closure maintenance was included in the ROWD for 20 years. The Financial Assurances F.1 and Provision H.15.E of this Order requires the Discharger to submit an updated cost estimate for post-closure

maintenance for the 30 year post-closure period. This Order also requires annual adjustments to account for inflation by 1 June of each year.

CEQA AND OTHER CONSIDERATIONS

107. In January 1988, the Calaveras County Planning Commission adopted a Final Environmental Impact Report (EIR), in accordance with the California Environmental Quality Act (CEQA)(Pub. Resources Code, § 21000 et seq.). Calaveras County has approved a general plan of development for the project and has issued a Use Permit for the project.
108. Subsequent to the Planning Commission's adoption of the EIR, the Central Valley Water Board adopted a negative declaration for the treatment and transfer of LCRF/PWP to FTR and the transfer of FTR fluids to the Skyrocket Pit on 4 August 1994.
109. This Order establishes closure requirements for the RMKM Site in order to ensure the protection of waters of the state. The issuance of this Order is exempt from the provisions of CEQA in accordance with California Code of Regulations, title 14, section 15301, which exempts the "operation, repair, maintenance, [and] permitting ... of existing public or private structures, facilities, mechanical equipment, or topographical features" from environmental review. This action may also be considered exempt because it is an action by a regulatory agency for the protection of natural resources (Cal. Code Regs., tit. 14, § 15307.) and an action by a regulatory agency for the protection of the environment (Cal. Code Regs., tit. 14, § 15308.).
110. RMKM consists of numerous WMUs, potential discharge points, and associated monitoring locations. Although a majority of the site is closed, mine impacted water is actively collected and managed through storage at Skyrocket Pit and discharge via a separate NPDES permit. Based on the threat and complexity of the discharge, the facility is determined to be classified 2-A 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 A complexity, defined as, "Any discharge or toxic wastes; any small volume discharge containing toxic waste; any facility having numerous discharge points and groundwater monitoring; or any Class 1 waste management unit."
111. State Water Board Resolution No. 68-16 (*Antidegradation Policy*) prohibits the Central Valley Water Board from authorizing the degradation of waters of the state unless it has been shown that:
 - a. The degradation is consistent with the maximum benefit to the people of the state;
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

- c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and
- d. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.

Although the evidence in the Board's files indicates that groundwater in the areas that underlie the RMKM Site is of generally poor quality, pockets of groundwater within these areas both inside and outside of the de-designation and variance area may nonetheless qualify as high-quality waters under the definition articulated in the *Antidegradation Policy*. Furthermore, though this Order largely contains provisions designed to restrict degradation by waste constituents associated with the RMKM, minor amounts of localized degradation, albeit at levels that do not threaten to impact beneficial uses, may nonetheless occur pursuant to this Order.

112. The discharges regulated by this Order are fully consistent with the *Antidegradation Policy* because:

- a. This Order implements a groundwater management strategy that focuses on preventing groundwater impacts from mining from causing downgradient impacts and that represents a reasonable expenditure of resources, which inheres to the maximum benefit of the people of the state, given the fact that MBC will still be required to protect groundwaters and surface waters that are not de-designated;
- b. Following the Central Valley Water Board's adoption of the BPA, portions of the groundwater underlying the RMKM Site is not designated as supporting the MUN and ARG beneficial uses, and therefore this Order is fully protective of all present and anticipated future beneficial uses;
- c. Any degradation that may occur pursuant to this Order will not result in water quality less than that prescribed in any state or regional policies, including the *Sources of Drinking Water Policy*, as amended; and
- d. As evidenced by the discussions in the *Remand Order* related to the impracticability of closing all of the WMUs to the prescriptive standards set forth under Title 27 for Group B wastes, and given the generally poor quality of much of the groundwater underlying the RMKM Site, the Central Valley Water Board can reasonably conclude that the continued management of groundwater as proposed in this Order should be considered to be the "best practicable treatment or control" of the waste discharges.

113. Water Code section 13267(b) states, in relevant part, that:

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

with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The technical reports required by this Order and the attached "Monitoring and Reporting Program R5-2016-XXXX" are necessary to ensure compliance with these waste discharge requirements. The Discharger operates and owns a majority of the facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

114. 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.
115. 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.
116. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Water Code sections 13263 and 13267, that Meridian Beartrack Co., their agents, successors, and assigns, in order to meet the provisions of Division 7 of the Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste', 'designated waste', 'Group A mining waste', and 'Group B mining waste' is prohibited other than as described in these WDRs. For the purposes of this Order, the terms 'hazardous waste', 'designated waste', 'Group A' and 'Group B' mining waste are as defined in California Code of Regulations, Title 23, section 2510 et seq. and Title 27.
2. The discharge of solid waste or liquid waste to surface waters, surface water drainage courses, or groundwater is prohibited except as specified by this Order and as authorized in NPDES Order No. R5-2013-0071.
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 or transfer of wastes to the FTR, LCRF, PWP, and FTR, West and Gold Knoll ODSs is prohibited.
5. The discharge or transfer of waste, other than LCRF and PWP LCRS liquid, to the PWP evaporation pond is prohibited.

6. The discharge or transfer of waste, other than FTR LCRS and ODS seep water, into Skyrocket Pit is prohibited.
7. The discharge of waste, other than water transferred from Skyrocket Pit during emergency situations, to the North Pit is prohibited.
8. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements dated April 2016 (SPRRs).

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 discharge of wastes shall not cause measurably significant degradation of current groundwater quality downgradient of the de-designation and variance area by allowing a statistically significant increase over background or baseline concentrations.
3. The Discharger shall operate and maintain the WMUs to minimize groundwater degradation and contain groundwater degradation within the de-designation and variance area.
4. If measurably significant evidence of a release of waste constituents downgradient of the de-designation and variance area is confirmed after resampling pursuant to the monitoring and reporting program, the Discharger shall implement the requirements of SPRR Section J Response to a Release.
5. Waste materials shall be confined to the waste management units designated for the specific waste as shown on Attachment B.
6. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs dated April 2016.

PWP, LCRF and FTR

7. Leachate collected from the LCRF and PWP LCRS may be transferred into the PWP evaporation pond or transported off-site to an appropriate disposal facility.

Skyrocket and North Pit

8. Leachate generated by the FTR LCRS and the ODSs may be captured and discharged into Skyrocket Pit or transported off-site to an appropriate disposal facility.
9. Ferrous sulfate may be discharged into Skyrocket Pit to reduce the arsenic concentrations to levels acceptable for discharge in accordance with NPDES Order R5-2013-0071. Ferrous sulfate may be discharged at a maximum concentration of 200 mg/L, and a maximum of 60,000 pounds of ferrous sulfate shall be discharged into

Skyrocket Pit each year. Prior to discharge of ferrous sulfate into Skyrocket Pit, the Discharger shall:

- a. Submit written notification to Central Valley Water Board staff within **four weeks** of proposed discharge including a workplan detailing the proposed ferrous sulfate treatment of Skyrocket Pit, schedule, and estimated quantity of ferrous sulfate to be discharged into Skyrocket Pit.
 - b. If requested by Central Valley Water Board staff, the Discharger shall conduct periodic monitoring and sampling of Skyrocket Pit during the treatment period in accordance with the Water Board staff request.
 - c. Include a summary of the discharge of ferrous sulfate for the treatment of Skyrocket Pit including in the Semi-Annual Monitoring Reports: summary of treatment procedures, quantity of ferrous sulfate added into Skyrocket Pit, and tabulated Skyrocket Pit water quality data with associated analytical laboratory reports.
10. The Discharger may change the Skyrocket Pit treatment method following written approval from the Executive Officer.
11. In the event the Discharger cannot meet the requirements of the NPDES permit for discharge into Littlejohns Creek Diversion Channel and Skyrocket Pit is at risk of overflowing, this Order allows the Discharger to reduce the Skyrocket Pit water level by transferring water to the North Pit to prevent unauthorized discharges into Littlejohns Creek Diversion Channel. This event is considered an emergency condition, and therefore the Discharger is allowed to initiate transfer to the North Pit. In initiating the emergency, the Discharger shall:
- a. Provide written notification to Central Valley Water Board staff **two weeks** prior to initiating emergency response and weekly during the transfer period.
 - b. Record the gallons of water pumped from Skyrocket Pit to North Pit.
 - c. Sample and test the North Pit liquid in accordance with the monitoring requirements in MRP R5-2016-XXXX.
 - d. Submit a report to the Central Valley Water Board **45 days** following the end of the transfer period documenting the emergency transfer operations including: cause of the emergency, gallons of water transferred, tabulated water quality data with associated analytical laboratory reports, summary of the changes to North Pit water quality, and a list of best management practices to implement to reduce the potential for future emergencies.

C. FACILITY SPECIFICATIONS

1. Annually, prior to the anticipated rainy season but no later than **31 October**, any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed and reported in compliance with MRP R5-2016-XXXX.
2. Surface drainage from diverted tributary areas shall not contact the ODSs, Skyrocket Pit, North Pit, FTR, LCRF, or PWP mining waste.
3. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs dated April 2016.

PWP, LCRF and FTR

4. There shall be no ponding of liquid on top of the LCRF, FTR, and PWP, excluding the PWP evaporation pond. Following removal of the PWP evaporation pond, there shall be no ponding of liquid on top of any portion of the PWP. Water that has contacted the leached concentrates of the LCRF or PWP shall be disposed of in the PWP evaporation pond or transferred offsite to an appropriate disposal facility.
5. The FTR spine, spring, and foundation drains may be abandoned by pressure grouting or other appropriate method approved by the Executive Officer. The Discharger shall submit a detailed workplan for approval by the Executive Officer a minimum of 90 days prior to the proposed work.
6. The FTR LCRS drains may be closed allowing leachate to build up within the FTR as long as the leachate does not seep to the surface at the FTR or further downstream. If an FTR surface seep is observed, the Discharger shall:
 - a. **Immediately** begin pumping FTR LCRS liquids to Skyrocket Pit.
 - b. **Immediately** notify Central Valley Water Board staff by telephone and email.
 - c. Submit written notification within **seven days** that includes a time schedule to contain and collect the seep to prevent discharge of FTR seep water to surface water bodies.
7. All under-drains and LCRS drains within the PWP and LCRF shall remain open and free flowing. Any mining waste collected in these drains and LCRSs shall be contained and disposed of in the PWP evaporation pond or transported off-site to an appropriate disposal facility.
8. Leachate generation in the LCRF and PWP is currently less than 1 gpm. If LCRS production increases to above 5 gpm, then the Discharger shall notify the Central Valley Water Board in writing within seven days. Notification shall include a time schedule to evaluate the source of the additional water in the LCRS and conduct an assessment of the WMU final cover. The Central Valley Water Board may require repair or other action necessary to reduce or eliminate leachate production.

9. Measures shall be taken to assure that unauthorized persons and animals are effectively excluded from LCRF and PWP.
10. The Discharger shall test the PWP and LCRF LCRSs at least annually to demonstrate proper operation as detailed in MRP R5-2016-XXXX.

Skyrocket and North Pits

11. Skyrocket Pit water level shall be kept below a level to:
 - a. Maintain capacity for wastewater flows to the Pit, precipitation from a 100-year 24-hour storm event (design storm) of 5.1 inches, and at least two (2.0) feet of freeboard at all times. The Discharger shall submit an updated Water Balance Model as detailed in Provision H.15.
 - b. Prevent any measurably significant degradation of current water quality in groundwater downgradient of the de-designation and variance area shown in Attachment C, as detailed in the 2014 BPA.
12. The Discharger shall **immediately** notify Central Valley Water Board staff by telephone and email and **immediately** take measures to regain Pit capacity in the event that freeboard levels are equal to or less than 2.0 feet plus the amount needed to hold the 100-year 24-hour design storm event.
13. After the North Pit receives water from Skyrocket Pit, the following requirements shall take effect:
 - a. The North Pit shall have capacity for wastewater flows to the impoundment, precipitation from a 100-year 24-hour storm event (design storm) of 5.1 inches, and shall maintain at least two (2.0) feet of freeboard at all times. The Discharger shall submit a Water Balance Model as detailed in Provision H.15.
 - b. The Discharger shall **immediately** notify Central Valley Water Board staff by telephone and email and **immediately** take measures to regain Pit capacity in the event that freeboard levels are equal to or less than 2.0 feet plus the amount needed to hold the 100-year 24-hour design storm event.
14. 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 monitoring and reporting program.
15. Any direct-line transfer to Skyrocket or North Pit shall have fail-safe equipment or operating procedures to prevent overfilling.
16. The Pits shall be designed, constructed and maintained to prevent scouring and/or erosion of the containment features at points of discharge to the impoundments and by wave action at the water line.

FTR, West, and Gold Knoll ODSs

17. ODS seeps shall be contained and transferred to Skyrocket Pit or appropriate disposal facility.
18. If new ODS seeps are observed, 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 contain the collect the seep to prevent discharge of ODS seep water to surface water bodies.

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 100-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. The LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the WMU and to prevent the buildup of hydraulic head on the outer liner at any time. The depth of fluid in LCRF and PWP LCRS sump shall be kept at or below one-foot. The depth of the liquid in the FTR LCRS shall be kept a level to prevent mining impacted water to seep to the surface.
6. 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.
7. The Discharger shall submit a design report including plans, specifications, and a construction quality assurance plan for review and approval prior to construction work related to the WMU containment and cover systems.
8. The Discharger shall submit a final report documenting construction work related to the WMU containment systems and cover for review and approval.
9. Measures shall be taken to ensure that synthetic liners are not punctured for the period during which the waste/processing material contained therein poses a threat to water

quality.

10. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs dated April 2016.
11. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs dated April 2016.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. The 1.3 acre PWP evaporation pond closure shall consist of:
 - a. Removing all precipitates and settled solids on the pond surface.
 - b. Cutting the geomembrane along the edge of the anchor trench along the crest of the pond slope.
 - c. Folding the geomembrane on the slope of the pond back over the bottom of the pond.
 - d. Removing the geomembrane from the anchor trench and laying over the geomembrane at the bottom of the pond. The 1.5 feet of cover soil placed over the footprint of the pond will be graded to blend with the existing PWP cover.
 - e. Placing a minimum of 1.5 feet of soil cover over the geosynthetics.
 - f. Backfilling and grading the area to promote drainage and prevent ponding.
 - g. Installing erosion control measures, as necessary, to reduce erosion before vegetation establishes itself.
 - h. Installing the required precipitation and drainage control systems to eliminate erosion.
2. Prior to closure, the Discharger shall submit an updated 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 ROWD, and shall meet the requirements of this Order. The Final Closure and Post-Closure Maintenance Plan shall provide for continued compliance with the applicable standards of Title 27 for waste containment, precipitation and drainage controls, and monitoring throughout closure and the post-closure maintenance period.
3. During closure and post-closure maintenance, the following shall be complied with: (a) erosion control and surface flow containment facilities shall be constructed and maintained to prevent siltation of surface waters; (b) all exposed cuts and fills shall be compacted, reseeded, and adequately watered to initiate and sustain plant growth as

soon as practicable, (c) disturbed areas of roadway shall be water barred as necessary and drained onto undisturbed areas with erosion control; (d) there shall be no removal of vegetation nor disturbance of natural soil conditions except where measures that will prevent erosion discharge to surface waters or storm drainage systems are installed and operational prior to 31 October in accordance with MRP R5-2016-XXXX.

4. Closed WMUs shall be provided with at least two permanent monuments, installed by a licensed land surveyor, from which the location and elevation of all wastes, containment structures, and monitoring facilities can be determined throughout the postclosure maintenance period.
5. Closed WMUs including the FTR, LCRS, PWP, and ODSs, which utilize final caps, shall be graded and maintained to prevent ponding, promote revegetation, and prevent erosion.
6. Closed areas with slopes greater than 10%, surface drainage courses, and areas subject to erosion by wind or water shall be designed, constructed, and maintained to prevent erosion.
7. The Discharger shall comply with all Closure and Post-Closure Maintenance Specifications listed in Section G of the SPRRs dated April 2016.

F. FINANCIAL ASSURANCES

1. By **1 June 2017**, pursuant to Title 27 Section 22212, the Discharger shall submit a report detailing the required post-closure site maintenance including a tabulated cost estimate for the 30-year post-closure period. Additionally, the Discharger shall include documentation showing that it has established an irrevocable **post-closure fund** with the Central Valley Water Board named as beneficiary to ensure post-closure maintenance for the FTR, LCRF, PWP, Skyrocket Pit, North Pit, and ODSs. The financial assurances mechanism shall be one listed in Title 27 section 22228 for which the Discharger is eligible. For financial assurance mechanisms requiring funding, the Discharger shall either fully fund the mechanism by 1 June 2017 or may propose a payment schedule. If the Discharger proposes a payment schedule to fund the mechanism, it shall submit a report by **1 June 2018** showing that the mechanism is fully funded. For financial assurance mechanisms not requiring funding, such as a Guarantee, the Discharger shall submit a report showing the mechanism is in place by **1 June 2017**.
2. By **1 June** of each year, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the post-closure and corrective action funds and the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27 section 22236.
3. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated April 2016.

G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, and surface water and in accordance with Monitoring and Reporting Program (MRP) R5-2016-XXXX, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated April 2016.
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 R5-2016-XXXX, and the Standard Monitoring Specifications listed in Section I of SPRRs dated April 2016.
3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP R5-2016-XXXX, and the SPRRs dated April 2016.
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 R5-2016-XXXX. For waste management units located within the de-designation and variance area, the point of compliance is considered the vertical surface located at the hydraulically downgradient limit of the de-designation and variance area that extends through the uppermost aquifer underlying the de-designation and variance area.
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 R5-2016-XXXX and the Standard Monitoring Specifications in Section I of the SPRRs dated April 2016.
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 April 2016.

H. PROVISIONS

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements, dated April 2016, 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 Monitoring and Reporting Program R5-2016-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 Monitoring and Reporting Program R5-2016-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 transferred to the Skyrocket and North Pits and PWP evaporation pond and the manner and location of the transfer. 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 provide the Regional Board a copy of the annual inspection report submitted to the Division of Safety of Dams (DSOD). The Discharger shall take appropriate actions to remedy damage as required by the DSOD.
6. The Discharger shall comply with all applicable provisions of Title 27 that are not specifically referred to in this Order.
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** 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. The Discharger shall comply with the notification requirements of Section 21710(c) of Title 27.
 11. These requirements are conditional upon receipt of all local and state permits for the project and are not intended to limit or reduce any obligations or requirements, which are imposed by any other authority having jurisdiction regarding the Project.
 12. The Discharger must comply with all conditions of this Order including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action, imposition of civil monetary liability, or revision or rescission of this Order.
 13. 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.
 14. The following reports shall be submitted pursuant to Section 13267 of the Water Code and shall be prepared by a California-registered civil engineer or certified engineering geologist:

Task

Compliance Date

A. Construction Plans

Submit construction and design plans for review and approval.
(see all Construction Specifications in Section D, above and Section F of the SPRRs.)

90 days prior to proposed construction

B. Construction Report

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).

60 days after completion of construction

C. Skyrocket Pit Water Balance Model

Submit a Water Balance Model report for Skyrocket Pit that includes:

1 December 2016

- a. Drainage calculations estimating the water level of the Skyrocket Pit corresponding to the maximum capacity of Pit equal to the 100-year 24-hour design storm event with two (2.0) feet of freeboard.
- b. Water Balance Model showing Pit levels not rising above the maximum Pit capacity.

D. North Pit Water Balance Model

Submit a Water Balance Model report for North Pit that includes:

1 December 2016

- a. Drainage calculations estimating the water level of the North Pit corresponding to the maximum capacity of Pit equal to the 100-year 24-hour design storm event with two (2.0) feet of freeboard.
- b. Water Balance Model showing Pit levels not rising above the maximum Pit capacity.

E. Final Closure and Post-Closure Maintenance Plan

Submit a Final Closure Post-Closure Maintenance Plan including inspection, maintenance, and monitoring of the facility during the post-closure maintenance period, a post-closure maintenance cost estimate for the entire facility, and proof the post-closure fund mechanism with the Central Valley Water Board listed as a beneficiary as detailed in Financial Assurances F.1. Inspection and maintenance will include the condition of the final cover, drainage features, LCRS, groundwater monitoring wells, access roads, and site security. The plan will be implemented for a minimum period of 30 years or until the waste no

1 June 2017

longer poses a threat to environmental quality,
whichever is greater.

F. Corrective Action Report

Submit a report detailing the corrective action associated with a known or reasonable foreseeable release from the FTR, LCRF, PWP, Skyrocket Pit, North Pit, and ODSs including a tabulated cost estimate for the corrective action. Additionally, the Corrective Action Report shall include documentation showing that it has established an irrevocable corrective action fund with the Central Valley Water Board named as beneficiary to ensure funds are available to address a known or reasonably foreseeable release, as detailed in Financial Assurances F.2.

1 June 2017

15. 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.
16. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.
17. This Order shall take effect upon the date of adoption.
18. The Discharger shall comply with all General Provision listed in Section K of the SPRRs dated April 2016.

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

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 of this Order, except that if the thirtieth day following the date of this Order 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

or will be provided upon request.

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

PAMELA C. CREEDON, Executive Officer

AAH/WMH