

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

**DRAFT STAFF REPORT FOR REGULAR MEETING OF MAY 30, 2013
Prepared on March 11, 2013**

ITEM NUMBER: XX

SUBJECT: Revised Waste Discharge Requirements for the Salinas Valley Solid Waste Authority, Crazy Horse Class III Closed Landfill, Monterey County, Order No. R3-2013-0016

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KEY INFORMATION:

Location: 350 Crazy Horse Canyon Road, approximately nine miles north of the City of Salinas, as shown on Figure 1 of Waste Discharge Requirements Order No. R3-2013-0016.

Owner/Operator: Salinas Valley Solid Waste Authority (Discharger or SVSWA).

Type of Waste: Non-hazardous municipal solid waste.

Capacity Used: Approximately 5 million cubic yards

Remaining Capacity: Closed to the public and self-haul customers on February 29, 2009, franchise haulers on May 30, 2009, and the Discharger's direct waste hauling operations on December 31, 2010.

Disposal: Canyon fill method.

Liner System: Approximately 15 acres lined and 57 acres unlined.

Existing Orders: Waste Discharge Requirements Order No. R3-2007-0003 and General Permit for Industrial Stormwater Discharges.

This Action: Adopt Waste Discharge Requirements Order No. R3-2013-0016

SUMMARY

Proposed Waste Discharge Requirements Order No. R3-2013-0016 ("Order" or "Order No. R3-2013-0016" Attachment 1) and proposed Monitoring and Reporting Program Order No. R3-2013-0016 ("MRP" Attachment 2) for the Salinas Valley Solid Waste Authority, Crazy Horse Class III Closed Landfill (Landfill), reflect changes resulting from the Landfill's closure. Although the Landfill's existing Waste Discharge Requirements are only five years old, key changes to the Order include:

1. Revises the Landfills status from active to closed;
2. Requires completion of final closure construction activities by October 1, 2013;
3. Documents the Landfill's closure construction (e.g. final cover design) and pollution control systems (e.g. landfill gas extraction, leachate collection and recirculation, and groundwater extraction and treatment) for the postclosure period.
4. Requires corrective action plan progress reports as a performance measure of corrective action goals, progress reports must propose corrective action improvements to meet corrective action goals;
5. Updates the Landfill's requirements and monitoring for postclosure; and

6. Summarizes the Landfill's site description and history including corrective actions.

The proposed Order benefits and protects groundwater and surface water by requiring adequate design, maintenance, inspection, and monitoring of engineering controls (e.g., final cover, surface drainages, sediment retention ponds, landfill gas extraction, leachate collection and recirculation, and groundwater extraction and treatment), and periodic evaluation of corrective actions to remediate existing groundwater impacts.

The recently constructed final cover will improve groundwater quality by reducing infiltration of water into the landfill and the formation of leachate and landfill gas, which are the primary mechanisms that landfills impact groundwater. The final cover will also improve stormwater runoff quality by reducing suspended sediment compared to the previous intermediate cover soils or the prescriptive vegetative soil layer. To provide a sustainable on-site solution to landfill liquids management, landfill leachate and excess landfill gas condensate is recirculated and infiltrated within the lined portion of the closed Landfill, eliminating transport of leachate to a disposal facility and reducing human exposure, leachate handling costs, air emissions, and overall environmental exposure. Despite the recirculation of landfill leachate and landfill gas condensate, both leachate and gas condensate will reduce with time due to the final cover reducing the infiltration of water into the landfill and the landfill gas extraction system removing significant moisture from the landfill.

Water Board staff and the Discharger will continue to work together to improve water quality facilitated by Corrective Action Plan Progress Reports required by the proposed Order. The Discharger continues to be cooperative and responsive in initiating actions for the protection of water quality

DISCUSSION

Proposed Order No. R3-2013-0016 updates and replaces Waste Discharge Requirements Order No. R3-2007-0003, adopted by the California Regional Water Quality Control Board, Central Coast Region (hereafter "Water Board") on February 9, 2007. Since 2007, the Salinas Valley Solid Waste Authority (Discharger) has stopped receiving waste at the Landfill, begun final closure, improved engineering controls to prevent water quality impacts, and implemented new corrective actions to remediate groundwater impacts. The proposed Order implements the requirements in California Code of Regulations Title 27 (CCR Title 27), and 40 Code of Federal Regulations, Parts 257 and 258 (40 CFR 257 and 258), both of which pertain to siting, design, construction, operation, and closure of solid waste management facilities. The Order also provides requirements and guidance for maintenance of engineering controls, corrective actions, preventative inspections, and monitoring during postclosure.

Facility Description: The Landfill is located approximately nine miles north of the city of Salinas and began operation in 1934; however, the Discharger has only owned the Landfill since 1997. The Landfill property boundary encompasses approximately 160 acres with a total waste footprint of approximately 72 acres. Land use within 1,000 feet of the landfill includes cattle grazing and rural residential use with several residences adjacent to the landfill property.

The Landfill operated as a burn dump in an old 6-acre disposal area now identified as Closed Module 1 or Module 1 until 1966. Module 1 received municipal solid waste from 1966 to 1972. Since 1972, a 66-acre municipal solid waste disposal area adjacent to Module I (Closed Fill Area or Fill Area) was developed in phases with 51 acres unlined and 15 acres of composite liner. **Findings 7-13** of the proposed Order describe the Landfill in greater detail.

Closure: The Discharger stopped receiving municipal solid waste at the Landfill in 2010 and prepared a final closure/post-closure maintenance plan (CPCMP) for the Landfill, which provided support and rationale for a proposed engineered alternative final cover design pursuant to Order No. R3-2007-0003. The proposed and now constructed final cover for the majority of the landfill is an innovative design that replaces the prescriptive clay low permeability layer, which tends to crack and perform poorly within a final cover, with a better performing linear low density polyethylene geomembrane and the prescriptive vegetative soil layer with a geosynthetic high density polyethylene artificial turf and sand ballast protective layer. The innovative liner design reduced construction environmental impacts and costs associated with importing soil from approximately 30 miles away, is expected to have lower maintenance costs, and is also expected to facilitate the implementation of solar power generation at the site during postclosure. The performance of the alternative composite cover's components in combination, equal and exceed the waste containment capability of the prescriptive design and performance specifications in CCR Title 27. The Executive Officer approved the final closure/postclosure maintenance plan during 2010 and subsequent revisions in 2011. The Discharger began closure construction in 2011 and is almost finished (only drainage improvements remain). The proposed Order requires the Discharger to complete final closure construction activities by October 1, 2013. **Findings 26-33** of the proposed Order describe the Landfill in greater detail.

Geology: The geology near the landfill consists of the following geologic units from youngest to oldest: recent alluvial deposits, Pleistocene marine terrace deposits, Pleistocene eolian/fluvial deposits of the Aromas Sand, Tertiary marine sediments of the Purisima Formation, older Tertiary formations, and the Cretaceous quartz diorite (granitic bedrock) basement complex. The sedimentary units are generally fine-grained and semiconsolidated in nature. Geologic cross sections depict bedding to be nearly flat but dipping slightly to the south across the Landfill site. **Findings 41-45** of the proposed Order describe the geologic setting, topography, structure, stratigraphy, and faulting in greater detail.

Hydrogeology: The groundwater flow system near the Landfill is complex but well characterized based on historical and current monitoring. Groundwater recharge occurs in the exposed granitic bedrock to the north of the Landfill, seasonally in the Crazy Horse Canyon drainage east of the Landfill and Central Ravine south of the Landfill, and from sediment retention ponds. Groundwater occurs within five hydrogeologic units including the alluvial unit, the localized perched unit within the upper Aromas Sand, the Aromas Sand, the Purisima Formation, and the granitic bedrock. The Aromas Sand and underlying Purisima Formation are naturally separated by a 40 to 50 feet thick aquitard ("Transition Zone") that appears to be laterally continuous beneath the Landfill site. Groundwater within each of the hydrogeologic units tends to flow towards the southwest due to the topography and structure of the historical canyon (Central Ravine). **Findings 46, 47, and 49** of the proposed Order describe hydrogeology in greater detail.

Surface Water: The waste disposal areas are located well above the 100-year flood plain and isolated hydrologically such that no run-on to the landfill occurs. All surface water drainage from the landfill passes through Sedimentation Retention Pond B, a manmade in-channel pond, located southeast and downgradient of the landfill. This Pond requires the Discharger to obtain Water Board 401 Water Quality Certification, Army Core of Engineers 404 Permit, and a Department of Fish and Wildlife Streambed Alteration Agreement to maintain and/or modify. During extended wet weather, water from Sedimentation Pond B overflows into Pesante Creek, which is within the Tembladero Slough drainage basin.

Pursuant to CCR Title 27, CFR 258, and existing Waste Discharge Requirements Order R3-2007-0003 the Landfill's final cover is designed to prevent infiltration of water and promote runoff through the use of a low permeable layer, steep side slopes, and a graded topdeck. To address the Landfill's increased runoff rates, the Discharger has installed check dams in landfill drainages to slow down runoff, modified the outlet of Sedimentation Pond B to restrict flow to 100 year 24-hour calculated pre-landfill runoff rates, and is in the process of expanding the pond to either reduce the controlled peak discharge rate further or maintain the restricted flow rate for longer. The proposed Order requires closure construction to be complete by October 1, 2013 to ensure required drainage improvements are finished prior to the next rainy season.

Several residential property owners downstream of the Landfill, adjacent to Pesante Creek, have expressed concerns about landfill runoff rates and sediment discharge during closure construction and specifically the 2012/2013 wet weather season. During final closure construction the landfill was covered for a significant period by the final cover geomembrane without artificial turf, sand ballast, or drainage retention improvements, resulting in greater flows than design depending on storm intensity. In addition, a main stormwater pipe for the Landfill failed during December 2012, resulting in erosion to an adjacent slope, exposure of unknown trash outside the landfill's waste footprint, significant loss of retention capacity in Sedimentation Retention Pond B, and sediment discharge. Water Board staff expects the stormwater runoff rates will be reduced and better controlled for future wet seasons because the final cover will be finalized and the improvements to the stormwater conveyance system will also be finished.

Groundwater Quality: There are three identified groundwater impact release areas, as shown on **Figure 6** of the proposed Order. The three release areas are identified as the Southern Release, Western Release, and Eastern Release.

Southern Release: Southern Release groundwater impacts were initially detected in the Aromas Sand aquifer south of Module I in 1984. The Southern Release is characterized by elevated chloride, total dissolved solids, and volatile organic compounds (VOCs). The VOCs primarily originate from Module I landfill gas and leachate sources; however some VOC impacts appear to have been due to historical practices on the former residential properties, located in the Southern Release area, and more recently the Eastern Release. The Southern Release identified VOC plume in the Aromas Sand originates from the southeast boundary of Closed Module I and extends southwest about 1,300 feet. Since 1998, total VOC concentrations in A-12 (centrally located in the Southern Release plume) have decreased from approximately 180 µg/L to approximately 35 µg/L in 2012. VOCs are also detected in the Purisima Formation but are low relative to the concentrations detected in nearby wells screened in the Aromas Sand, and appear to be the result of vertical migration of contaminants through improperly installed multi-zone wells, which the Discharger modified in 1998 by sealing the lower screened portions of the wells.

Western Release: Western Release groundwater impacts were initially detected in 1996 in monitoring well A-31, and appear to be due to landfill gas as groundwater monitoring results indicate background levels of inorganic constituents and trace to low levels for limited VOCs. Since final cover construction began in 2010, VOC detections have trended slightly higher with a greater number of VOC's detected. The recent increasing VOC trends in the Western Release coincide with construction of the final cover, which has required periodic landfill gas extraction shut downs while also causing more landfill gas production due to water application on the landfill for soil compaction and dust control, and landfill gas migration due to the positive pressure created by the final cover. Completion of the final cover and consistent operation of

the landfill gas extraction system is expected to decrease landfill gas related VOCs in groundwater in this area quickly.

Eastern Release: The Eastern Release was initially identified in monitoring well A-8 with increasing trends for VOCs from 1997-2003. Based on groundwater monitoring results, groundwater flow, and hydrogeology the Eastern Release plume appears to ultimately travel south combining with the Southern Release. Although the Eastern Release impacts were originally attributed to landfill gas migration, increasing trends continued despite various landfill gas extraction improvements. In 2011, the Discharger demolished and removed the former Covanta gas-to-energy facility; during demolition the Discharger identified a series of subsurface pipelines that may have transported landfill gas condensate to the subsurface. The Discharger is currently investigating potential soil impacts below the gas-to-energy facility and six disposal sumps near the scalehouse to determine if this is the source for the Eastern Release groundwater impacts.

Downgradient Supply Wells: Eight downgradient domestic supply wells (Githens, Whitcomb, Howard, Newman [former Polinski], Grider, 370 Crazy Horse Canyon Road, 380 Crazy Horse Canyon Road, and Burton) are monitored regularly as part of the Landfill's MRP, as requested by homeowners and residents. Landfill and/or disinfection related VOCs have been detected periodically at trace concentrations or very low levels in the Burton and Grider wells since monitoring began, in 1999 and 2004 respectively. In addition, very infrequent, unconfirmed, trace detections of VOCs have been detected in the other residential wells since 1999. Although detected VOC concentrations are well below maximum contaminant levels (MCLs) and the Water Board cannot require replacement water unless contaminant concentrations are above MCLs, the discharger proactively monitors and maintains a granular activated carbon canister on the Grider Well to remove low level VOCs. The Discharger is currently considering adding a granular activated carbon canister to the Burton Well based on recent more consistent trace detections and proximity to the Southern Release plume.

Corrective Actions: Since 1987, the Discharger has implemented various corrective actions to improve groundwater quality impacts from Module 1 and the adjacent Fill Area including the following:

1. Installation and operation of a landfill gas extraction system in 1987 with subsequent modification/expansion in 1998, 2004, and 2009;
2. Installation of a groundwater extraction and treatment system and a final cover over Module I in 1988.
3. Modification of eight multi-zone wells downgradient of Module I to prevent the vertical migration of groundwater contaminants;
4. Clean closure of an abandoned disposal site in 2001, located outside the waste footprint along the southwest edge of the property.
5. Installation of a passive bioremediation system pilot test downgradient of Closed Module I to enhance biodegradation of VOCs in groundwater through the injection of hydrogen releasing compound (HRC) in 2008.
6. Installation of a final cover over the Fill Area and final cover extension of Closed Module I from 2011 to 2013.
7. Investigation and anticipated removal of landfill gas condensate disposal sumps and related VOC impacted soils in 2013.
8. Anticipated clean closure of waste, discovered during 2012 outside the landfill footprint on the southern end of the landfill, in 2013.

The Discharger submitted a Corrective Action Plan dated September 14, 2010, with revisions on October 22, 2010, April 27, 2012, and March 14, 2013. The 2013 Corrective Action Plan describes the existing corrective actions including bioremediation, groundwater pump and treat, landfill gas extraction, and installation of the final cover system. The Plan also outlines future corrective action implementation of tasks and goals. The goals for corrective action are as follows: initially stabilize and then decrease VOC concentrations in groundwater, followed by a reduction of the individual VOCs below MCLs, and finally reduce individual VOCs below measurable concentrations. The Corrective Action Plan further outlines the goals as measurable targets in the near term (18 months after closure construction is completed), short term (3 years after closure construction is completed), intermediate (5 years after closure construction is completed), and long term (10 years after closure construction is completed). If the measurable targets or goals within each release area are not met within the timeframe specified, the Corrective Action Plan proposes additional corrective actions including landfill gas system evaluation/enhancement, additional groundwater extraction improvements, bioremediation system operation/expansion, and source control related to soil impacts near the former gas-to-energy facility. The Corrective Action Plan will likely be revised or receive an addendum to account for the investigation of the gas condensate soil impacts near the former gas-to-energy plant.

Water Board staff recognize that the recent construction of the final cover is a significant corrective action focused on source control. The final cover is a protective barrier layer over waste that minimizes the infiltration of water into the waste; thereby reducing the production of leachate and landfill gas, the primary mechanisms landfills impact water quality. Another benefit of the final cover will be improvement in Landfill gas extraction and better control over management of stormwater runoff.

The proposed Order requires Corrective Action Plan Progress Reports to evaluate attainment of the measurable targets within 3, 5, and 10 years of completion of Landfill closure construction. The Discharger must propose and implement further corrective actions, in accordance with Title 27 and the Order, if the final cover and/or other pollution control systems do not result in improved water quality over time.

COMPLIANCE HISTORY

The Landfill is out of compliance with the existing Order because of the identified release areas discussed above. In addition, several violations at the Landfill have been noted by Water Board staff since 2007:

1. Landfill Gas Condensate Spill – In March and April 2012 landfill gas condensate spills occurred during construction of the final cover. During a Water Board inspection on March 28, 2012 Water Board staff observed staining on the final cover below a landfill gas condensate pump, which was dripping condensate very slowly. The Discharger corrected the leak promptly and later reported that the condensate pump valve likely leaked for up to a week following a normal maintenance procedure in which the valve was inadvertently left closed, and estimated approximately seven gallons of landfill gas condensate discharged to the ground. On April 23, 2012, the Discharger discovered a landfill gas condensate leak from a loose landfill gas end cap. The Discharger repaired the landfill gas end cap and estimated 30-40 gallons of condensate discharged to the ground.

2. Inadequate Stormwater Drainage Handling Capacity – In December 2012, a main stormwater pipe for the Landfill failed, resulting in erosion to an adjacent slope, exposure of unknown trash outside the landfill's waste footprint, loss of retention capacity in Sedimentation Retention Pond B, and significant sediment discharge. The Discharger promptly fixed the stormwater pipe, covered the eroded slope and exposed trash with a temporary membrane, notified Water Board staff that permanent corrective actions including clean closure and slope repair would be delayed until the dry weather season due to access/safety issues, and performed emergency dredging in the sedimentation retention pond to restore capacity
3. Inadequate Leachate Removal – The gravity collection pipe for the Closed Fill Area LCRS was capped and leachate was not removed from above the liner for approximately four months based on the Dischargers 2012 2nd Semiannual and Annual Monitoring Report.

Overall the Discharger is responsive to Water Board staff's information requests, comments, concerns, and readily addresses compliance issues. The Discharger has met formal report deadlines.

MONITORING AND REPORTING PROGRAM

The Landfill MRP includes:

Part I – Monitoring and Observation Schedule: This section requires periodic routine inspections of the Landfill and pollution control systems (leachate collection and removal, landfill gas collection and removal, and groundwater extraction and treatment), rainfall data records, and detailed analytical monitoring of groundwater, leachate, and Landfill gas.

Part II – Sample Collection and Analysis: This section establishes criteria for sample collection and analysis, methods to determine concentration limits, and specifies how the Discharger must maintain these records.

Part III – Statistical and Non-Statistical Analysis of Data: This section establishes methods for the Discharger to determine Landfill compliance with water quality protection standards based on laboratory analytical information.

Part IV – Reporting: This section establishes formats and requirements that the Discharger must follow when submitting analytical data, annual reports, and summaries to the Water Board.

Part V – Definition of Terms: This section defines specific terms used in the MRP.

Monitoring and Reporting Program Changes: Water Board staff revised the existing MRP for the Landfill to coincide with revised Order No. R3-2013-0016, key revisions include:

1. Reclassification of monitoring wells to corrective action monitoring. Several wells were previously classified as detection monitoring despite historical and existing detection of pollutants.
2. Addition of interior soil pore gas probe monitoring to evaluate performance of the landfill gas extraction system for preventing landfill gas migration related water quality impacts.
3. Clarification and expansion of stormwater monitoring and reporting requirements for leachate seeps and spills;

4. Changes to Groundwater, Surface Water and Leachate Monitoring Parameters (addition of total alkalinity and manganese; removal of magnesium and antimony) to improve evaluation of release characteristics and to increase consistency with other landfill monitoring programs.
5. A restructured format for ease of compliance with requirements and for consistency with other landfill monitoring programs.

Monitoring of stormwater discharges from the Landfill will also continue under "Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities (General Storm Water Permit for Industrial Activities)," under State Water Resources Control Board (State Water Board) Water Quality Order No. 97-03-DWQ and National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS00001.

ENVIRONMENTAL SUMMARY

Order No. R3-2013-0016 contains prohibitions, discharge specifications, water quality protection standards, and provisions intended to protect the environment by mitigating or avoiding impacts to water quality during Landfill closure and postclosure.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The SVSWA prepared an Initial Study/Mitigated Negative Declaration (IS/MND) for the Landfill Final Closure Project and associated 2009 CPCMP, which was certified as adequate and in compliance with the California Environmental Quality Act by the SVSWA Board on March 20, 2009. However, the Landfill's 2009 CPCMP was subsequently updated in 2009 and 2010 to include construction of a synthetic vegetative cover (as opposed to natural vegetative cover originally proposed), addition of drainage structures for the lower sedimentation basin, installation of a leachate recirculation system, and installation of a solar-based power generation system. As a result, the SVSWA completed and circulated a 2010 IS/MND on August 5, 2010, to address the changes to the Landfill Final Closure Project. The 2010 IS/MND was approved by the SVSWA Board on September 23, 2010 and the SVSWA filed a Notice of Determination with the Monterey County Recorder's Office on September 27, 2010 that was posted for 30 days.

PUBLIC NOTICE AND COMMENTS ON ORDER NO. R3-2013-0016

(Public comments due April 5, 2013)

CONCLUSION

The proposed Order updates closure and postclosure requirements for the SVSWA Crazy Horse Class III Closed Landfill and protects groundwater and surface water by requiring adequate design, maintenance, and monitoring of engineering controls (e.g., final cover, surface drainages, sediment retention ponds, landfill gas extraction, leachate collection and recirculation, and groundwater extraction and treatment), and periodic evaluation of corrective actions to remediate existing groundwater impacts. The Discharger's approved final closure and postclosure maintenance plans are consistent with CCR Title 27 performance standards and the actions taken as part of these plans, the Discharger 2013 Corrective Action Plan, and the proposed Order addresses existing water quality impacts.

RECOMMENDATION

Adopt Waste Discharge Requirements Order No. R3-2013-0016 and Monitoring and Reporting Program No. R3-2013-0016.

ATTACHMENT

Waste Discharge Requirements Order No. R3-2013-0016, including Monitoring and Reporting Program No. R3-2013-0016.

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