

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

STAFF REPORT FOR REGULAR MEETING OF MARCH 20-21, 2008

Prepared on February 27, 2008

ITEM NUMBER: 30

**SUBJECT: REVISED WASTE DISCHARGE REQUIREMENTS FOR THE
SALINAS VALLEY SOLID WASTE AUTHORITY JOHNSON
CANYON ROAD CLASS III LANDFILL, MONTEREY COUNTY--
ORDER NO. R3-2008-0011**

KEY INFORMATION:

Location: Approximately 2 miles northeast of Gonzales along Johnson Canyon Road.
Type of Waste: Non-hazardous municipal solid wastes
Design Capacity: 13.9 million cubic yards permitted (total refuse capacity based on .54 tons per cubic yard of waste)
Remaining Capacity: 9.4 million cubic yards
Liner Design: Module I unlined; Module II and IIINW clay lined; Modules III through X and Module A composite lined
Disposal: Land-based on Fill Module Method
Existing Orders: Waste Discharge Requirements, Order No. 01-020, Super Order No. 93-84.
This Action: Adopt Waste Discharge Requirements Order No. R3-2008-0011

SUMMARY

The proposed Waste Discharge Requirements Order No. R3-2008-0011 ("Order" or "Order No. R3-2008-0011") for the Johnson Canyon Landfill (Attachment 1) specify landfill design and operation modifications to protect water quality. The revisions proposed in Order No. R3-2008-0011 and Monitoring and Reporting Program (MRP) No. R3-2008-0011 (Attachment 2), are necessary to update the regulatory and operational status of the Johnson Canyon Landfill (Landfill). The Salinas Valley Solid Waste Authority (Discharger) owns the Landfill. The proposed Order includes:

- a. A proposed 16.3-acre horizontal and vertical expansion;
- b. Conclusions of the groundwater evaluation monitoring program (EMP),
- c. A provision for a groundwater corrective action plan including enhanced monitoring and contingency, and
- d. Review of the prescriptive performance standards for future bottom liner designs.

The proposed WDR benefits and protects groundwater and surface water through required engineering controls, corrective action, and monitoring. To improve protection of groundwater, the proposed WDR includes a provision for the Discharger to improve the groundwater monitoring program via installation of additional downgradient monitoring well(s).

DISCUSSION

The proposed Order updates and replaces Waste Discharge Requirements Order No. 01-020, adopted by the Regional Board in March 2001. The proposed Order covers the current landfill operations and provides guidance and requirements for planned changes at the Landfill. For the lined portion of the facility, design and construction specifications within the proposed Order meet or exceed requirements in both the California Code of Regulations (CCR) Title 27, and 40 Code of Federal Regulations, Parts 257 and 258, both of which pertain to design of solid waste management facilities.

FACILITY DESCRIPTION: The Landfill is located approximately 30 miles inland from the Pacific Ocean, on the northeastern margin of the Salinas Valley (Figure 1 of Attachment 1). Monterey County, the prior owner/operator, opened the Landfill to the general public on July 26, 1976. The 163-acre Class III municipal solid waste landfill facility is currently owned by the Salinas Valley Solid Waste Authority, with 96.3 acres permitted for waste disposal. A 15-acre parcel located in the northeast corner of the site is set aside as part of "Special-Status Amphibian Mitigation Plan" to address impacts to special-status amphibians (i.e., California tiger salamander and the western spadefoot toad) that are affected by the construction of future modules and continued disposal activities at the Landfill.

Proposed facility changes include enhanced materials diversion and recovery practices to reduce waste disposal volumes; these include a recyclables drop-off center and recyclable household hazardous waste drop-off center, and greenwaste and wood grinding/composting for use as alternate daily cover or off-site use.

Adjacent Land and Water Use: Property within two miles of the Landfill is used primarily for agricultural use and cattle ranching. In January 1998, the Discharger purchased the Ripley property, located adjacent and northeast of the Landfill, and incorporated it into the Landfill boundary. Pacific Wine Partners and Blackstone Vineyards currently use the land southwest of the Landfill for treated winery wastewater disposal. A cattle feeding operation currently resides on the property to the northwest of the Landfill, across Johnson Canyon Road. An airport building is located approximately one mile south of the Landfill.

There are 29 wells located within a mile of the Landfill. Thirteen of these wells are used for domestic, livestock, or irrigation purposes, with the remainder used as monitoring wells (including landfill monitoring). One well (Amaral) used for livestock is located 160 feet crossgradient from the Landfill, across the road and north of the Landfill. This well is included in the monitoring and reporting program and has no detected VOCs. The next closest domestic well is located approximately 2,000 feet crossgradient from the Landfill. The closest municipal well is located approximately 1.6 miles southwest and downgradient of the Landfill.

Landfill Operations: The construction of the Landfill is based on a 96.3-acre permitted waste footprint divided into 11 fill modules. These modules include Module I, an unlined module approximately 11-acres in size, and nine lined (existing and proposed) modules. Modules II through X are based on 30- to 60-feet (ft) deep by approximately 1200-ft long by 200-ft wide sequential rectangular excavations, each five- to seven-acres in size (Figure 3 of Attachment 1). Planned Module A represents a 16.3-acre southward expansion to the southern property boundary from Modules II through X.

Module I received waste between 1976 until 1988 and was constructed by trench and fill followed by area fill method in which waste was placed in discrete lifts, then compacted and

covered on a daily basis. Modules II and III Northwest, approximately 4.8 and 2.0 acres in size, respectively, are pre-Subtitle D but are lined with one foot of compacted clay (with a permeability of 1×10^{-6} centimeters per second) and both include leachate collection systems. Modules IV through X (V/VI now in operation) are planned as sequential excavations, with composite liners, 15-ft lifts and a 4% downward slope toward Module X when completely filled. Modules IIIA, IV, and V/VI contain CCR Title 27 and 40 Code of Federal Regulations (CFR) 258 compliant composite liners and leachate collection and removal systems. The fact that Modules I, II and III Northwest predate and therefore do not have Subtitle D bottom liner systems makes these modules more susceptible to downward migration of leachate and landfill gas.

A proposed vertical expansion allows for refuse placement to 100 feet above natural grade at the western edge of the facility, and refuse placement over existing upslope refuse areas (including Module I), with a final grade of 4% downward slope from east to west. The Landfill is expected to reach its full capacity by 2040 with the proposed expansion.

Existing Modules III, IV and V/VI include a composite liner and leachate collection and removal systems, described as follows:

- Lower Component: a minimum six-inches of scarified and recompacted subgrade;
- Middle Component: geosynthetic clay liner and a minimum 40-thousandths of an inch (mils) synthetic flexible membrane liner, or a minimum 60-mils high-density polyethylene. The middle component must be installed in direct and uniform contact with the lower component; and,
- Upper component: Geocomposite drain covered with a 24-inch protective soil layer, or 12-inches of sand drainage layer covered with a 12-inch protective soil layer.

The above design had been approved by the Executive Officer for in place Subtitle D modules as an engineered alternative design that satisfies the performance criteria in 40 CFR § 258.40, and satisfies the criteria for an engineered alternative to Prescriptive Design, as provided by CCR Title 27 § 20080 (b), where the performance of the alternative composite liner's components, in combination, equal or exceed the waste containment capability of the Prescriptive Design.

Future modules will be designed and constructed to meet or exceed minimum standards established in Title 27, §20240 (c), (d), §20260, and §20310, 40 CFR 258.40 and 258.60 et al., and any additional requirements of this Board. Where there is a conflict between State and Federal regulations, the most water quality protective regulation applies. For future module liner designs, the Executive Officer will evaluate engineered alternative designs on a module by module basis with respect to performance standards of the Prescriptive Design. Recent data suggests that geosynthetic clay liners may not perform as well as the Prescriptive Design in conditions of differential settlement, deformation, and percolation of high total-dissolved-solid-laden leachate.

SEISMIC DESIGN: Several northeast trending, right lateral faults occur in the region, including the San Andreas Fault zone, located approximately 12 miles northeast of the Landfill. The closest mapped fault system is the Reliz/Rinconada fault system, with the Reliz and Rinconada faults approximately six miles southwest and 16 miles south of the Landfill, respectively. However, geologic mapping and seismological data indicate that the Reliz/Rinconada fault system is not presently active nor has it been active during the Holocene (past 11,500 years).

Order No. 01-020 identified an unnamed, northwest trending fault located approximately two miles north of the Landfill. This fault is not substantiated by fault maps reported in the 2007 Joint Technical Document. According to the 2007 Joint Technical Document, the Landfill is designed to withstand a Maximum Probable Earthquake of magnitude 7.9 on the Richter Scale from the San Andreas Fault, resulting in an estimated ground motion of 0.35 times gravitational acceleration (g) at the site. The 2001 staff report for Johnson Canyon reported that earthquakes emanating from the San Andreas Fault having a magnitude of 7.5 to 8.5 and a peak horizontal acceleration of 0.46g are possible; however, the 2007 Joint Technical Document (JTD) reported that the source of this information was not available. Staff will closely review the latest seismic information when reviewing and approving future module designs.

SURFACE WATER AND GROUNDWATER: Groundwater occurs beneath the site in alluvial fan deposits that overlie granitic bedrock. Groundwater may occur locally in perched zones controlled by local stratigraphic conditions (e.g., clay or silt layers) within the alluvial fan sequences.

The vadose zone is up to 285 feet thick beneath the Landfill. The water table is encountered at depths of between approximately 185 feet and 285 feet below the ground surface. This has a bearing on potential transport mechanisms for contaminants to travel to groundwater because of the long path length. Groundwater flow direction trends to the southwest with a groundwater mound occurring beneath Pond 2 (Figure A-1 of Attachment 2).

CONTROL SYSTEMS: The leachate collection and removal system (LCRS) in Modules II, III, IV, and V/VI are designed to maintain a leachate head on the liner at one foot or less, per 40CFR258 regulation. After leachate is mechanically removed (mechanical system became operational in December 1999; in 2002 it was automated along with other improvements) from the sumps, it is stored in an aboveground storage tank. Leachate is used for dust control or soil compaction over lined modules. Monitoring requirements for the LCRS are detailed in Attachment 2.

A landfill gas monitoring and control system has been in place in Module I, II and III since fall 2000. In 2004, the control system was expanded with installation of eight landfill gas extraction wells on the west side of Module IV as part of groundwater cleanup efforts. Produced landfill gas is burned at the onsite flare under permit. The Landfill has various buildings for administrative, storage, and maintenance purposes that are monitored for gas.

There are six temporary storm water sedimentation retention basins located at the Landfill to control the quality of storm water runoff. One basin (No. 2) perennially contains water. The Landfill's storm water quality is monitored separately via the State Water Resources Control Board's (SWRCB) General Permit No. 3 271013452 for Storm Water Discharges Associated with Industrial Activities.

COMPLIANCE HISTORY: The Discharger has largely been compliant with the Order 01-020 requirements since its adoption in March 2001. However, the Discharger has had the following violations over the period of the Order:

- 1) Ongoing violations for low-level concentrations of VOCs in detection monitoring wells. As a result, Discharger was required to initiate an evaluation monitoring program (now complete).
- 2) Violation for leachate exposure at the surface and nearby storm drainages.

These violations are described in more detail below.

On October 23, 2000, the Discharger submitted an initial EMP report to address the detection of VOCs, including perchloroethene (PCE), from interior groundwater monitoring well JC-4, which constituted a violation of the waste discharge requirements. The Discharger installed three monitoring wells to fill data gaps along the western border of the Landfill as part of the initial EMP. During the initial EMP activities, VOCs were detected in existing well JC-7, on the southwestern property boundary. As a result, the Discharger conducted an additional EMP in 2003 and 2004 to delineate the offsite extent of impacted groundwater, and fill data gaps along the property boundary. As documented in the Discharger's August 2005 Additional Evaluation Monitoring Program report, the work included four exploratory borings, including one beyond the property boundary, and collection of associated grab groundwater samples, and groundwater fate and transport modeling.

The results of the additional evaluation monitoring program indicate that VOC-impacted groundwater, using PCE as a surrogate, extends approximately 300 feet downgradient of the southwestern property boundary beneath a large field used for disposal of treated winery wastewater. The Discharger's groundwater fate and transport model indicates, assuming source control and no PCE degradation, that the maximum downgradient extent that the plume (given the current maximum PCE concentration of 2.5 micrograms per liter) will travel is approximately 2,000 feet southwest of the Landfill. Assuming chemical degradation, the plume will move less than 1,000 feet before attenuating to below detection levels. The nearest downgradient municipal supply well is approximately 1.6 miles downgradient from the Landfill; therefore, the well does not appear to be threatened by the plume. One well (Amaral) used for livestock is located 160 feet crossgradient from the Landfill. This well is included in the monitoring and reporting program and has not shown any indication of being impacted from the Landfill. The closest domestic well is located approximately 2,000 feet crossgradient from the Landfill.

The additional evaluation monitoring program concludes that VOCs in groundwater are a result of landfill gas, and not leachate, which is supported by the lack of elevated total dissolved solids, chloride, and other inorganic constituents in downgradient groundwater. The evaluation monitoring program report suggests that the gas extraction system, operational since August 2000, will control the VOC source and, along with chemical degradation as well as other natural attenuation processes, will ultimately reduce the extent of the dissolved VOC plume in the groundwater. As such, the Discharger maintained the original remedy proposed in the 2001 Engineering Feasibility Study of enhanced landfill gas extraction and natural attenuation.

The fact that PCE concentrations stopped increasing after 2004, and have averaged approximately 2.5 micrograms per liter at the boundary since 2004 (Finding No. 25 in the Order) led Water Board staff to concur with the evaluation monitoring report findings and the recommendations in the 2001 Engineering Feasibility Report. In a January 2008 letter the Executive Officer concurred that groundwater data indicates this corrective action adequately contains the VOC plume. However, the letter stipulated, and Reporting Requirement No. E.6 in the proposed Order requires that the Discharger to submit a groundwater corrective action plan by September 30, 2008. The corrective action plan must specify source control, performance monitoring, additional offsite/downgradient monitoring well(s), and a contingency plan.

In a letter dated April 2, 2002, the Executive Officer issued a Notice of Violation for leachate seeps that were caused by a faulty leachate collection and removal system in Module IV. The

faulty system resulted in excessive leachate buildup over the liner system. The violation also included faulty leachate pumping systems in Modules II and III. The leachate seep at Module IV had leaked into the storm drainage system. The violation letter required the Discharger to submit a corrective action plan by April 15, 2002.

On April 12, 2002, The Discharger submitted a correction action plan that included automation of the leachate collection and removal system as follows:

- Incorporation of a programmable logic controller (PLC) that monitors utility power, leachate storage tank level, air compressor operation, air pressure switch, and sends an alarm via an autodialer if any faults are detected,
- Leachate sump pump cycle counter to monitor pump activity,
- Pneumatic liquid level indicator in each Module's leachate sump,
- Pressure switch that provides an alarm signal to the PLC when pressure drops too low, and
- Leachate tank level sensor.

The corrective action plan also includes operation and maintenance procedures for the system. By September 26, 2002, the Discharger had installed and began operating the upgrades to the leachate collection and removal system. Interim work included pumping down the leachate collected in the modules, fixing and adding new pneumatic pumps, cleaning out and repairing pipelines, and adding flow totalizer meters at each sump location.

Staff's review of monitoring reports and recent landfill inspections indicates that the leachate collection and removal systems continue to have significant operations and maintenance issues associated with pump fouling and sediment buildup in discharge lines. As a result, MRP No. R3-2008-0011 includes a modification of LCRS maintenance requirement to check and record fluid levels in the sumps on a biweekly basis, and to solve pumping problems in a more timely fashion (e.g., have all necessary spare parts and equipment at the site; have backup means to pump leachate out of the sumps). In addition, the reporting requirements require that fluid levels be tabulated and graphed in the monitoring reports.

FUTURE PLANS: The future development of Modules VII through X and Module A lateral expansion was discussed above. Pursuant to discussions with the Discharger, the Discharger intends to start design and construction of Module A in 2009.

The discharger is pursuing converting the Landfill into a regional landfill for the Discharger's Salinas Valley customers. Consequently, in March 2000, the Discharger completed a Site Characterization Study to provide baseline information for possible expansion of the Landfill to the east. As discussed below, the Discharger completed the California Environmental Quality Act (CEQA) process in preparation for the regional landfill. Upon closure of the Crazy Horse Class III Landfill in Prunedale (scheduled for late 2008) and transfer of its waste stream to Johnson Canyon Landfill, the Johnson Canyon Landfill will become the Discharger's regional facility.

MONITORING AND REPORTING PROGRAM (MRP) CONTENT: Changes to the proposed MRP consist of:**Part I: Monitoring and Observation Schedule**

Table 1 of Attachment 2, Monitoring Parameters, has been amended from prior MRP No. 01-020's Table 1 by adding total alkalinity and perchlorate. These parameters are being included to improve the Water Board's ability to detect releases from the Landfill. Alkalinity is generally found to be elevated in landfill leachate and groundwater that is impacted by landfill gas. Perchlorate is an emerging contaminant with a recently promulgated California Maximum Contaminant Level of 6 µg/L. Contaminant of Concern (COC) parameters in Table 3 of Attachment 3, monitored every five years, were amended to include organophosphorous pesticides and chlorinated herbicides. These constituents potentially could be disposed of in the Landfill as residue on agricultural crop waste.

Detection monitoring well JC-4 is no longer included in the monitoring and reporting program because it was properly destroyed when Module IV/V was constructed over its location. Staff changed the nomenclature of monitoring wells JC-7, JC-12, and JC-15 from detection monitoring wells to corrective action wells because these wells have consistent detectable concentrations of VOCs and the Discharger shall use these wells to monitor the performance of the corrective action.

A requirement for biweekly monitoring of fluid levels in the leachate sumps was added to the MRP to ensure that fouling of the leachate collection and removal system is identified and remedied in a timely fashion.

Part IV: Reporting

A requirement that measurements of fluid levels in the LCRS be tabulated and graphed in the semiannual reports was added to the MRP to facilitate review of compliance.

ENVIRONMENTAL UPDATE:

In October 2002, A Regional Solid Waste Facilities Project Environmental Impact Report (EIR) (SCH# 2000021027) evaluated an increase in solid waste system disposal capacity for the region served by the Discharger, including a certification of a vertical and lateral expansion at the Landfill. The EIR found nine potential impacts to soils/geology and water quality. Out of the potential impacts, seven were found to be less than significant and two potential impacts required mitigation measures to be considered less-than-significant impacts, as follows:

- Impact 4.1.3.1-b: Landsliding. Integrity of the landfill's liner system could be affected by sliding along the geosynthetic clay liner (GCL) and the geomembrane liner interface.

Mitigation Measures: To increase the static factor of safety against sliding along the geosynthetic clay liner/high density polyethylene geomembrane interface, the bottom liner shall be stepped by periodically reversing the slope of the bottom liner.

- Impact 4.1.3.1-c: Slope Stability. The placement of waste in the Landfill could result in unstable slopes, depending upon the height and placement of waste piles. Waste fill slope failure could be a hazard to landfill employees. Slope failure could also expose waste to storm water and infiltrating rainwater.

Mitigation Measures: The stability of interim stages of waste fill placement shall be evaluated prior to finalizing the landfill's fill sequencing plan. The evaluation shall determine whether interim waste fill slopes identified in the fill sequencing plan could pose a safety hazard. If potential hazards are identified, detailed measures to minimize any hazards shall be identified, including revision the fill sequencing plan to minimize the height of waste slopes, if necessary.

RESPONSE TO COMMENTS:

The draft Order and MRP No. R3-2008-0011 were distributed to a list of interested parties and agencies that have been historically involved with the Landfill. Comments received on the draft Order and MRP are included in Attachment 3. All submitted comments were considered and nearly all were either included upon receipt or had previously been included in the original draft versions.

Comments from Geo-Logic Associates (GLA), Salinas Valley Solid Waste Authority's contractor:

- 1) GLA would prefer to sample the Amaral supply well on a routine monitoring frequency instead of a frequency based on decision logic.

Water Board staff's response: Staff concurs with this request and has included the Amaral well in the MRP as sampled on a semiannual frequency.

- 2) The proposed leachate sampling protocol is confusing as to when samples are to be collected from each of the sumps. Suggest streamlining the frequency of sampling.

Water Board staff's response: Staff concurs. Staff changed the sampling frequency as follows: a) Collect samples from each module's leachate sump, composite samples in the laboratory, and analyze for monitored parameters every year except the third year. b) On the third year, analyze samples from each sump for monitored parameters. c) Every fifth year, the composite sample shall also be analyzed for COCs.

- 3) The due date for the corrective action plan amendment should allow time for contract procurement and report preparation. Suggest August 2008 as submittal date for the corrective action plan amendment.

Water Board staff's response: Staff concurs with the recommendation, in particular after considering Salinas Valley Solid Waste Authority's work load this year to prepare for the Crazy Horse Landfill closure and corrective action, and complete the Jolon Road Landfill's final closure documents.

RECOMMENDATION:

Adopt proposed Waste Discharge Requirements Order No. R3-2008-0011.

ATTACHMENTS:

1. Proposed Waste Discharge Requirements Order No. R3-2008-0011
2. Proposed Monitoring and Reporting Program No. R3-2008-0011
3. Comment letters

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