

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

STAFF REPORT FOR REGULAR MEETING OF AUGUST 31, 2009
Prepared July 16, 2009

ITEM NUMBER: 12

SUBJECT Update of Waste Discharge Requirements (WDRs) for Housing Authority of the County of Santa Cruz, Buena Vista Migrant Labor Camp and Tierra Alta Apartments, Santa Cruz County – WDR Order No. R3-2009-0043

KEY INFORMATION

Discharger: Housing Authority of the County of Santa Cruz
Location: 113 Tierra Alta Drive, Watsonville, CA 95076
Discharge Type: Domestic sewage
Design: Recirculating sand filter
Disposal: Percolation/evaporation ponds and leachfields
Capacity: 56,000 gallons per day (gpd)
Reclamation: None
Existing Orders: Waste Discharge Requirements Order No. 94-86
This action: **Approve Waste Discharge Requirements Order No. R3-2009-0043**

SUMMARY

Staff proposes to update waste discharge requirements for the discharge of residential wastewater at the Buena Vista Migrant Labor Camp/Tierra Alta Apartments (Camp). Updated requirements include modified effluent limitations for total dissolved solids, sodium, and chloride. Staff recommends the Regional Water Board adopt proposed Order No. R3-2009-0043.

BACKGROUND

The Housing Authority of the County of Santa Cruz (the Discharger) owns and operates housing for migrant workers in the camp and for permanent residents in apartments at the location noted above. The Discharger also owns a system to treat and dispose of the wastewater from the residences. Santa Cruz County's Department of Public Works operates and maintains the system on behalf of the Discharger.

The Pájaro Valley in the vicinity of the Camp is underlain essentially flat-lying unconsolidated sedimentary deposits. Directly underlying the Camp are the Terrace Deposits of Watsonville, an accumulation of silt, silty clay, sand, and gravel more than 200 feet thick. Gravel tends to be abundant within this formation's bottom 60 to 130 feet. The deposits are in overall hydraulic continuity with the upper Aromas Formation, which underlies the Terrace Deposits of Watsonville.

The Aromas Formation is a heterogeneous sequence of sand, silt, clay, and gravel up to about 700 feet thick. An upper aquifer zone in the Aromas Formation is unconfined beneath the Terrace Deposits. The Aromas Formation is the principal aquifer in the Pájaro Valley.

Agricultural pumping from the Aromas Formation influences the groundwater surface elevation and flow direction in the Camp's vicinity. During the season when groundwater is not extracted, the water table elevation averages 5 feet above mean sea level or around 100 feet deep at the Camp where the leachfields are and 50 feet deep at the lowest pond. Groundwater flows to the southeast at an average gradient of 0.001 foot/foot. During the pumping season, the water table drops. Perched groundwater occurs locally in the Terrace Deposits. The Discharger extracts potable water from an onsite well near the residences; the well is 200 feet deep.

The Camp lies at the confluence of Gallighan and Harkins Sloughs, both tributary to Watsonville Slough, which joins the Pájaro River near the Pacific Ocean coastline. Through its estuary, the Pájaro River discharges to the Pacific Ocean.

Labor camp and apartment residents use supplied groundwaters domestically, mostly to drink, cook, bathe, launder clothes, and transport sanitary wastes to the treatment system. Table 1 presents the water supply's low levels of TDS, sodium, chloride, and nitrate. As residents use the water, they increase the constituent concentrations to the levels found in the community's wastewater; see Table 1.

Sanitary wastes are the primary source of organic materials and nitrogen. Naturally occurring bacteria would utilize both to supply energy for growth.

The treatment system consists of septic tanks followed by recirculating sand filters; the disposal system comprises five percolation/evaporation ponds and two leachfields. The septic tanks quickly convert nitrogen in the sanitary waste, found as urea, to ammonia while removing many solids. The recirculating sand filter progressively reduces the oxygen demand posed by the wastewater's organic materials by filtering out degradable solids and breaking down dissolved organic materials; the sand filter also converts ammonia to nitrate. The treatment system cannot reduce TDS, sodium or chloride concentrations, for it is a biological treatment process. These constituents pass through to disposal.

Effluent limitations in Order No. 94-86 for TDS, sodium and chloride are similar to one another. For each pollutant, the Order establishes the limitation by adding a reasonable concentration to the pollutant's concentration in the water supply. Thus, the TDS, sodium, and chloride limitations are the pollutant's water supply concentration plus 250 milligrams per liter (mg/L), 70 mg/L, and 65 mg/L, respectively.

The California Code of Regulations at Title 22 establishes a secondary Maximum Contaminant Level (MCL) for TDS in drinking water at 1,000 mg/L.

Since 1994, the Discharger has monitored concentrations of the noted pollutants every month. Table No. 1 presents the results, averaged since January 2007.

Table 1

Average pollutant concentrations from Jan 2007 through Mar 2009, mg/L				
Pollutant	Water supply	Effluent	Difference	Comply?
TDS	363	585	222	Yes
Na	30	73	43	Yes
Cl	32	67	35	Yes
NO ₃ (as N)	2	25	23	Not applicable

Figures 1 through 4 contrast TDS, sodium, chloride, and nitrate concentrations since January 2007 in the discharge and the potable water supply.

Figure 1

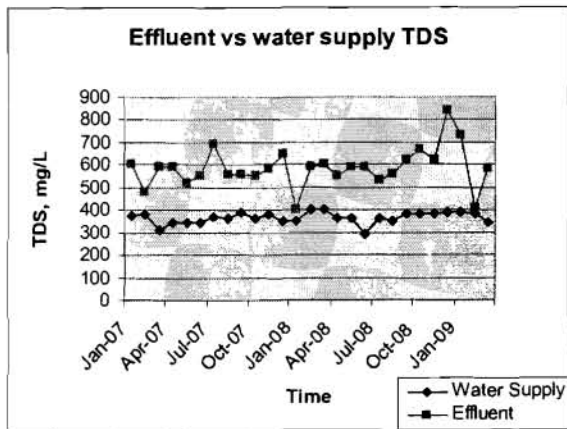


Figure 2

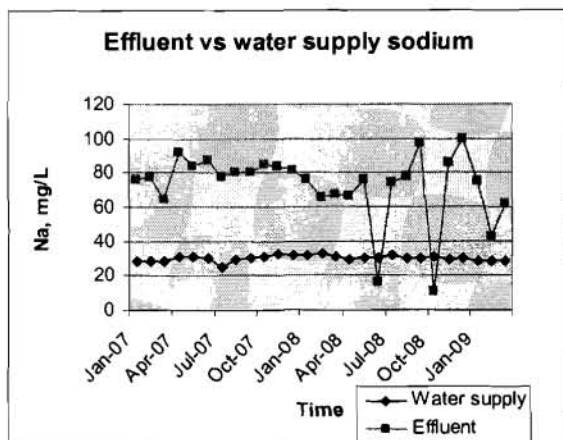


Figure 3

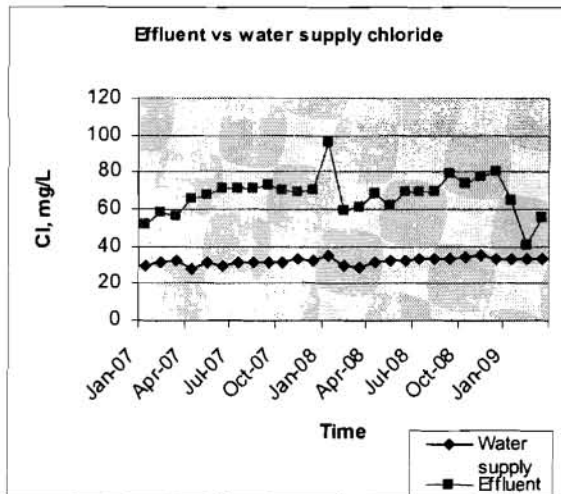
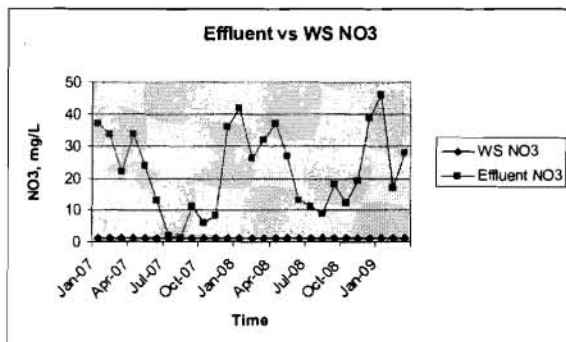


Figure 4



DISCUSSION

As noted above, the Terrace Deposits and the underlying Aromas Formation vary widely in both composition and extent. Although hydraulic connectivity between the disposal areas and the aquifer is likely, it is impossible to accurately quantify it.

Staff employed various analytical schemes to assess if the discharge is polluting the groundwater. In the first, staff scrutinized the water quality data. As shown in Figures 1 through 4, the data show no change in the water supply pollutant concentrations although effluent pollutant concentrations sometimes vary substantially. The data exhibit no trends in increasing or decreasing water supply pollutant concentrations. Water supply monitoring therefore found no evidence that the discharge is degrading groundwater quality.

The second approach evaluated the discharge's dilution in the groundwater based on worst case assumptions for the hydraulic conductivities of the geologic formations underlying the disposal sites, the flow area, and the groundwater gradient. This analysis found the discharge flowrate is small relative to the groundwater flowrate. Therefore, the groundwater likely dilutes the discharge's pollutant

concentrations to background levels soon after they combine. This analysis assumed the formations are homogeneous and consist of the most transmissive materials; that is, all sand with no interbedded deposits of lower transmissivities. The discharge's flowrate is likely less than estimated because less-transmissive deposits are present; their extent is not known. The analysis found no impairment of groundwaters.

The third approach evaluated the leachfield systems for compliance with the Basin Plan's design standards. One leachfield system consists of three trenches 25 feet deep and 375 feet in length while the second comprises eight trenches 16 feet deep and 813 feet in length. With half the average daily flow applied to the leachfields (while the other half goes to the ponds), the application rate is around 0.8 gpd/square foot. This is the Basin Plan's rate for percolation rates between one to 20 minutes per inch, which is typical of many soil complexes, such as may be found beneath the disposal sites.

Staff also considered the discharge's remoteness from other substantial wastewater discharges. There are no wastewater discharges to land of a similar size within one mile. Therefore, the discharge cannot combine with another and thereby increase the potential to degrade the quality of underlying groundwaters.

Staff also concludes the discharge is likely not degrading water quality in the surface waters, Gallighan Slough and Watsonville Slough. The sloughs are losing streams; that is, the surface waters drain into groundwaters. Therefore, groundwaters carrying the discharge's pollutants do not enter surface waters.

COMPLIANCE HISTORY/STATUS

As inspection of the data in the preceding figures demonstrates, the Discharger has often been unable to comply with the existing Order's effluent limitations. From time to time, the discharge's pollutant concentrations temporarily spiked upward and violated the limit. However, the data in Table 1 also show that, over the long term, the discharge has complied with the limitation. Therefore, staff proposes to change the compliance standard for the subject pollutants to the "12-month running mean" instead of comparing the individual sample results every month.

The County Department of Public Works monitors the leachfields systems every two weeks. Monitoring continues to verify adequate performance. Staff inspections have invariably found the ponds to be free of vegetation and odor. The ponds can hold about 3.5 million gallons which comprise both treated wastewater and rainwater. At the average flowrate, the ponds provide around four months detention time, far more than usually needed to adequately stabilize the remaining waste constituents and prevent odors.

The recirculating sand filters were new in 1994. The sand medium has not been flushed since then. Operational staff report ponding on the filter surface and have tried to improve performance. But ponding continues. The proposed Order includes a Provision that requires the Discharger to evaluate the sand filter for its maintenance needs and to propose a time schedule to implement maintenance actions.

MONITORING AND REPORTING PROGRAM (MRP)

Proposed MRP No. R3-2009-0063 would track the same constituents as existing MRP No. 94-86, which the Executive Officer revised on October 21, 1997. However, the MRP reduces the frequency of some sampling. That is, the Discharger shall sample water supply and effluent for TDS, sodium, and chloride quarterly. The Discharger shall sample effluent total nitrogen and nitrate quarterly. The

Discharger is required to sample the water supply for nitrate by Santa Cruz County Environmental Health Services. The Discharger formerly monitored these constituents monthly.

CEQA SUMMARY

These waste discharge requirements are for an existing facility and are exempt from provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Section 15301, Chapter 3, Title 14, of the California Code of Regulations.

CHANGES TO THE EXISTING ORDER

The proposed Order changes the effluent limitations such that the discharger will average the concentrations for TDS, sodium, and chloride over the prior twelve month period before comparing the results to the respective effluent limitation. The Discharger previously compare each monthly sample result with the effluent limitation.

The proposed Order requires the Discharger to reasonably manage its salts use to prevent a substantial increase in effluent salt concentrations. The Discharger shall report its salt management practices to the Executive Officer annually.

The Proposed Order requires the Discharger to evaluate maintenance and upgrade needs for the sand filter and to propose a time schedule of steps to upgrade and/or maintain the filter.

The proposed MRP reduces the sampling frequency from monthly to quarterly for most constituents.

COMMENTS

Discharger – Comments state Discharger does not oppose the proposed Order.
Santa Cruz County Environmental Health Services - No response

RECOMMENDATION

Adopt Order No. R3-2009-0043, as proposed

ATTACHMENTS

Proposed Waste Discharge Requirements Order No. R3-2009-0043
Proposed Monitoring and Reporting Program No. R3-2009-0043.

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