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

## STAFF REPORT FOR REGULAR MEETING OF MAY 12-13, 2005

Prepared on December 3, 2004

**ITEM:** **26**

**SUBJECT:** **Revised Waste Discharge Requirements, Order No. R3-2005-0017 for Hanson Aggregates, Santa Margarita Quarry, San Luis Obispo County**

## KEY INFORMATION

| | |
|---|---|
| Discharger: | Hanson Aggregates |
| Location: | 3.5 miles northeast of Santa Margarita |
| Discharge Type: | Storm runoff and process washwater |
| Current Flow Rate: | Unknown |
| Design Capacity: | 288,000 gpd plus 90,000 gpd of make-up water |
| Disposal Method: | Incidental evaporation and percolation |
| Recycling: | All process water is recycled |
| Existing Order: | Waste Discharge Requirements Order No. 00-005 |

## SUMMARY

Waste Discharge Requirements Order No. 00-005 regulates Hanson Aggregates, Santa Margarita Quarry's rock washing wastewater discharge. Among other things, that Order limits total dissolved solids concentrations to "550 mg/L on an annual basis." Hanson Aggregates has difficulty meeting that limit. Consequently, Hanson Aggregates presented information to support a total dissolved solids limit increase. Staff reviewed the Discharger's information and agrees that a site-specific limit would be more appropriate. This Order is nearly identical to existing Order No. 00-005, except that the total dissolved solids limit has been changed to water supply plus 300 mg\L, and other non-substantive wording changes have been made.

## DISCUSSION

Facility Description

Hanson Aggregates Mid Pacific, Inc. owns and operates the 400-acre Santa Margarita Quarry, located approximately 3.5 miles northeast of Santa Margarita and adjacent to the Salinas River. At the Santa Margarita Quarry, Hanson Aggregates mines and produces quarry rock and asphalt. Quarry operations include the impoundment of 288,000 gallons of water to use for washing fines from quarried rock. Wash water is discharged to evaporation and percolation ponds where it is settled and recycled for rock washing. Major water losses occur via evaporation from ponds and wet, stockpiled rocks; and on-site dust control activities. To make-up for water loss, the Discharger captures up to 90,000 gallons per day of Salinas River water, which is about thirty percent of the total volume of impounded water. Wastewater is not discharged off of the site.

Storm water from within the process area is diverted to the ponds for utilization as wash water. Quarry storm water is contained in the large quarry pit that has sufficient capacity to contain all storm water from the disturbed area. Captured storm water is used as dust control within the plant and to supplement to wash water demands.

Waste streams of concern

The waste streams of concern consist of the previously mentioned wash water and storm water. While the washing system is "closed," washwater losses occur via evaporation, percolation through pond bottoms, and water drawn from settling

ponds for dust control use. The process increases total dissolved solids (TDS) in process water by about 300 mg/L, as determined by a comparison of intake water to settling pond water. Hanson Aggregates does not add chemicals to the washwater.

Potential problems

It is highly unlikely that potential problems could arise from the waste streams of concern. Since the waste stream is discharged to land, the land filters any settleable and suspended solids. Since the settling pond's function is to settle fines, the following estimate suggests that relatively little process water percolates to groundwater:

Vertical Darcy's Law calculation:

$$\frac{Q}{A} = -k\frac{dh}{dl}$$

Where:

$Q$ = volumetric flux

$A$ = cross section area of pond bottom

$k$ = hydraulic conductivity of pond bottom

$\frac{dh}{dl}$ = gradient

Assuming:

$A$ = 10,000 $m^2$,

$k$ = $10^{-8}$ cm/sec,

$\frac{dh}{dl}$ = 1

Then:

Q = 8.64 X $10^{-2}$ $m^3$ /day

= 23 gal/day

= 2.5 X $10^{-2}$ acre feet/year.

This is a very small percolation (recharge) volumetric flux. The volumetric flux calculated is linear in $k$. The assumed value, $k$ = $10^{-8}$ cm/sec, is the nominal value for a clay liner, as used in a hazardous waste landfill. The $k$ value for the fine sediment in the bottom of the ponds has not been measured, but could actually be lower than this. Even if it were slightly higher, the volumetric flux would be small. Therefore, almost all water losses are due to evaporation.

Evaporation occurs from ponds, from washed and stockpiled rock, and from dust control. Evaporation leaves behind residual minerals that may flow from the site or percolate to the subsurface. However, staff believes the quantity of residual minerals is not sufficient to alter water quality of the Salinas River or subsurface water.

Storm water is currently contained within the quarry operation and is used to supplement supply water diverted from the Salinas River.

If the need arises to discharge settled storm water, the Discharger will file a Notice of Intent to be regulated by the General Storm Water Permit. The requirements specified are designed to protect surface waters, groundwaters, and prevent nuisance conditions resulting from quarry operations.

The site does not have a history of odor problems, nor does staff expect odors to emanate from silt ponds. No significant organics are added to the water.

Should power go out, water would drain to the lower pond. On-site portable pumps can serve until power is restored. Power outages should not cause significant problems.

Overflows do not pose a significant threat to water quality because the water does not contain significant organics. Presumably, if the ponds did overflow, they would overflow settled water.

Environment

The 400-acre Santa Margarita Quarry facility is located adjacent to the Salinas River, 3.5 miles northeast of the community of Santa Margarita, in a rural locale. There are no nearby neighbors.

While the existing order finds that the facility is located in the Atascadero subarea of the Paso Robles groundwater basin, it is actually outside of those boundaries. More correctly, the facility is located in an alluvium/bedrock (it is the bedrock that is being quarried) reach of the Salinas River, downgradient of the Pozo groundwater basin and upgradient of the Paso Robles groundwater basin. The existing order's staff report supported the finding that the facility is not over the Paso Robles groundwater basin. It said:

> Local groundwater movement is in a north easterly direction towards the Salinas River.

Groundwater monitoring is not included in the monitoring program since the quarry is located over a non-water bearing granite formation.

Groundwater basins in the region are described in various publications. As shown by the SLO County Department of Planning and Building "Groundwater Basins" map, there are two groundwater basins upstream of the Quarry site. These are #17 Rinconada Valley and #18 Pozo Valley. State DWR Bulletin 118 (10/1/03 update) also describes the basins. For Rinconada Valley groundwater quality, "No information is available." For Pozo Valley groundwater quality, "Analyses of groundwater from 5 wells in this basin taken during 1951 through 1988 show TDS content ranging from 287 to 676 mg/L." Both of these basins are separated from the Quarry site by several miles of bedrock reach of the Salinas River, and Pozo Valley basin is above Lake Santa Margarita, so there is no actual hydraulic connection with the Quarry site.

Downstream of the Quarry site approximately 2 miles is a large groundwater basin called "Atascadero sub-area of the Paso Robles groundwater basin" in the RWQCB Basin Plan, "Salinas Valley" groundwater basin on the SLO County Department of Planning and Building "Groundwater Basins" map, and "Atascadero Subbasin of the Paso Robles Groundwater Basin" in the *Final Report, Paso Robles Groundwater Basin Study* (Fugro, August 2002 for SLO County Public Works Department). There are abundant TDS data for the Atascadero sub-area, and increasing TDS is a concern. As shown in the Fugro, report two wells near the confluence of Salinas River and Santa Margarita Creek (north of Garden Farms) had values of 330 and 430 mg/L, while wells farther north had much higher values. This area is separated from the Quarry site by approximately 2 miles of bedrock reach, so there is no actual hydraulic connection.

To the north of the Quarry for approximately 1 mile of stream reach, around a bend to the Highway 58 bridge, is a flat area that probably contains an isolated alluvial aquifer, although there are no direct data for this. The gradient of the river is approximately 20 feet drop in 5000 feet of stream, or 0.004. In the lack of any real data, this may be supposed to be approximately the gradient of the supposed alluvial aquifer in the area of the ponds, with flow in a northerly direction. This is a relatively low gradient, suggesting that any groundwater flow is quite slow. It must be emphasized that is speculation based on the local geomorphology, and that there are no real groundwater data near the Quarry site.

Existing Effluent Limits

Although the quarry is located over a non-water bearing granite formation, the existing waste discharge requirements applied the Atascadero sub-area's water quality objectives for effluent limits. Such an application does not conform to the Basin Plan. The Basin Plan says its objectives are, at best, representative of gross areas only and application of the objectives must synchronously reflect the actual groundwater quality naturally present. Since the actual groundwater quality naturally present is not in the Atascadero sub-area, applying the Atascadero sub-area's median objectives is inappropriate. Not only is it inappropriate, it causes the discharger great difficulty.

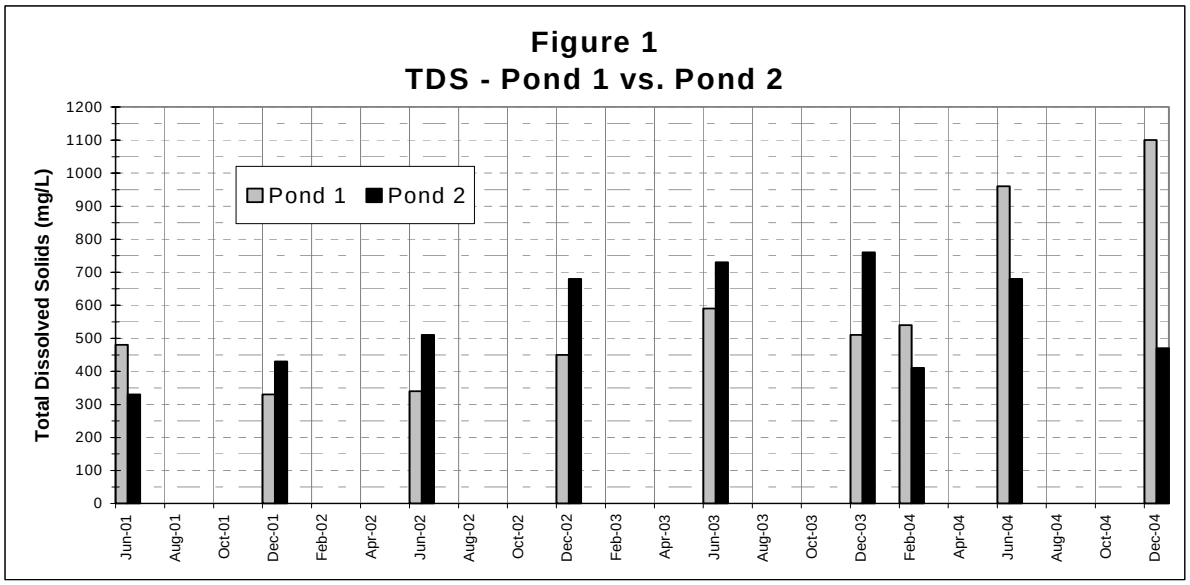
Sometimes, the discharger violates the current TDS effluent limitation of 550 mg/L. However the "violations" do not necessarily indicate compromised water quality. The "violations" are a comparison of pond TDS to a general objective for an unrelated receiving water. Although pond TDS may be realtively high, it does not necessarily translate to a receiving water impact because, as discussed earlier, very little pond water percolates to groundwater.

Because the current TDS effluent limitation has an imprecise basis, a more precise TDS effluent limitation should be established that would be fairer to the discharger and would still protect water quality.

Proposed Effluent Limits

Before promulgating waste discharge requirements, the Regional Board must afford full consideration to:

(1) Present and probable future beneficial uses affected by the waste discharge;




Present and probable future beneficial uses of groundwater underlying the discharge are:

- Municipal and Domestic Supply
- Agricultural Supply, and
- Industrial Service Supply

(2) Competing beneficial uses;

The groundwater has no competing beneficial uses because there are few, if any, residential, agricultural, or industrial entities drawing from it. The quarry occupies 400 acres of that area.

(3) Degree of impact on existing beneficial uses;

The remote facility has been discharging for many years. Yet there has been no discernable impact on existing beneficial uses. The discharge is relatively small and low-threat. As mentioned earlier, it consists of a low flux of water that percolates through deposited fine-grained soils. Realistically, the discharge rate is insignificant compared to the receiving water flow. The percolation rate is estimated at 25 gallons per day while the Salinas River (and its underflow) flows at 150,000 to 300,000 gallons per day.

The wastewater does not contain any appreciable organics or added chemicals. The only real threat is slightly but consistently elevated TDS, not unlike that which results from any irrigation practice.

(4) Receiving water quality;

The receiving water quality is assumed to be similar to the surface water quality of the Salinas River, since the groundwater is contained by bedrock. The groundwater can be considered Salinas River underflow. With respect to TDS, the receiving water quality varies depending on time of year and amount of preceding precipitation. If no appreciable precipitation has occurred for a while, the "first flush" carries dissolved minerals downstream, causing a TDS increase. If up to thirty percent of that water is diverted to the facility, then the wastewater quality will correlate to the surface water quality.

The discharger's analysis suggests that the washing process increases TDS by a relatively constant amount, as shown in Figure 1, and the washwater TDS correlates with the adjacent surface water TDS.

While the discharger supplied no data to support the contention that the washwater TDS correlates with the adjacent surface water TDS, one could reasonably assume that to be the case. Figure 1 shows TDS values for Pond 1 and Pond 2. Pond 2 usually includes a high percentage of makeup water drawn from the Salinas River. It serves as a reasonable estimate of adjacent surface water quality.

Until recently, the Santa Margarita reservoir hasn't spilled over the Salinas Dam since 2001 because rainfall hasn't been substantial enough to fill the reservoir. Consequently, the reservoir elevation has lowered, with a corresponding increase in TDS of the impounded water. However, since San Luis Obispo County annually releases water from the reservoir, one would expect the Salinas River TDS below the dam to increase proportionally. Figure 1 indicates such a trend. Pond 1 trends mirror Pond 2 trends and indicate higher TDS during the drought conditions. Yet Pond 2 and Pond 1 are usually within 300 mg/L of each other, suggesting a constant range of TDS increases through the discharger's process.

As mentioned earlier, the downgradient Atascadero sub-area of the Paso Robles groundwater basin shows, in the two wells near the confluence of Salinas River and Santa Margarita Creek (north of Garden Farms), TDS values of 330 and 430 mg/L. These relatively low TDS values provide a clue as to the receiving water quality as well as the discharge's impact on the receiving water. It should be remembered that the wells are separated from the Quarry site by approximately 2 miles of bedrock reach.

(5) Water quality objectives.

The local groundwater water quality objectives are:

Tastes and Odors - Groundwaters shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses.

Radioactivity - Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

Bacteria - The median concentration of coliform organisms over any seven-day period shall be less than 2.2/100 ml.

Organic Chemicals, Chemical Constituents, and Radioactivity –
Groundwaters shall not contain concentrations of organic chemicals, chemical constituents and radioactivity in excess of the Maximum Contaminant Levels of Title 22 or in amounts that adversely affect the Agricultural Supply beneficial use.

Considering the above, it seems prudent to set a TDS limit that reflects historic discharge rates because those practices conform to Basin Plan intent; the discharge does not violate water quality standards. Historically, the discharger reported TDS values in Pond 2 (which impounds a large percentage of fresh river water) and Pond 1, as shown in Figure 1. Although Pond 1 receives washwater and Pond 2 receives recycled washwater and fresh make-up water, the data do not indicate that Pond 1 has a consistently higher TDS. The dynamic TDS difference could be due to factors such as inconsistent sample labeling or varying water quality in the supply water. It should be noted that the same person is listed as the "sampler" for every sampling event, making the labeling error theory less likely. Nonetheless, the average TDS difference has been around 150 mg/L, with a peak difference topping out at 250 mg/L.

Considering those historic patterns, a TDS effluent limit of 300 mg/L above the intake water level, as represented in pond 2, should allow continued operation while detecting unusual TDS loadings. It should be stressed that the washwater system is essentially a closed system and the only real discharge comes from dust control activities and percolation from the ponds, which is assumed to be minimal because of a probable natural sealing due to the settlement of fine-grained soil particles. The waste stream and TDS loading is extremely small and occurs over a large area.

## ENVIRONMENTAL SUMMARY

These waste discharge requirements are for an existing facility and are exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et. seq.) in accordance with Section 15301, Article 19, Chapter 3, Division 6, Title 14 of the California Code of Regulations.

## COMMENTS

Staff solicited comments from the discharger, SLO County Environmental Health, and SLO County Department of Planning & Building. No substantive comments were received.

## ATTACHMENTS

1. Draft Waste Discharge Requirements Order No. R3-2005-0017
2. Monitoring and Reporting Program No. R3-2005-0017

## RECOMMENDATION

Adoption of proposed Order No. R3-2005-0017

TJK
126-01
S:\WDR\WDR Facilities\San Luis Obispo Co\Hanson Santa Margarita Quarry\Staff report.doc
File: Hanson Aggregates