INFORMATION SHEET

WDR ORDER NO. _____
CHARLES FULTON, CAROL FULTON, AND FULTON FAMILY TRUST
FOR OPERATION OF FULTON RECLAMATION FACILITY, INC.
GLENN COUNTY

Fulton Family Trust owns 273.1 acres (Assessors Parcel Number No. 024-100-018) in Glenn County, approximately five miles south of the City of Orland. Charles Fulton and Carol Fulton reside and operate a drilling mud recycling/soil amendment operation, Fulton Reclamation Facility Inc., a California corporation (hereafter Facility), on the Fulton Family Trust land. Charles Fulton, Carol Fulton, and Fulton Family Trust are hereafter referred to as Discharger.

The initial Waste Discharge Requirements (WDRs), adopted by the Regional Water Board on 28 October 1988 (WDR Order No. 88-192), named Harry and Alvin Rehse, of the Rehse Drilling Mud Site and Soil Reclamation Facility, as Discharger. WDR Order No. 88-192 was revised on 26 May 1995 as WDR Order No. 95-124, naming Carole and Charles Fulton of Fulton Reclamation Inc. as Discharger.

WDR Order No. 88-182 specified a drilling mud application rate of 8 percent by dry weight, or 208 tons per acre dry weight, of drilling mud. The dry weight of drilling mud is computed as the dry weight in one cubic foot to the weight of a cubic foot volume of the predominant Cortina Very Gravelly Sandy Loam Soil where it is applied as an amendment. WDR Order No. 95-124 specified an increase to 12 percent (312 dry tons per acre) in addition to prescribing requirements for the operation of a soil reclamation facility using drilling mud as a soil amendment. WDR Order No. R5-2002-0141 continued the 12 percent drilling mud application rate. Part of both Orders was a monitoring and reporting program requiring extensive soils and vadose zone testing by gathering soil horizon data, agronomic data, and vadose zone information using lysimeters, in addition to groundwater and waste load testing and monitoring.

On 9 August 2006, the Discharger submitted a Report of Waste Discharge and technical information requesting the Regional Water Board increase the Facility drilling mud application rate from 12 percent to 16 percent. In a 10 September 2007 letter, the Discharger requested the 12 percent application rate be increased to 24 percent, instead of 16 percent, and proposed changes to the monitoring and reporting program. Technical information to support the 24 percent increase has not been submitted.

HISTORIC AND EXISTING OPERATIONS

Drilling muds have been discharged to a portion of the land since the mid 1970's. At that time, discharges of drilling mud to five ponds occurred on approximately 80 acres. Beginning in 1985, drilling mud was discharged directly to land, allowed to dry, and disced into the ground in an experimental land spreading operation. The amount of drilling mud added to the soil was approximately ½ percent dry weight. A pond closure plan was approved on 22 June 1989 and the ponds were officially closed on 20 November 1991. The Facility now receives non-hazardous drilling mud and uses the material, as a soil amendment on 232 of the 273.1 acres, by discing the dried mud into the upper 1-foot of native soil to improve soil texture, nutrient levels, and water holding capacity, creating an agriculturally more productive soil.

Compared to the Facility's native soil, drilling mud generally contains elevated total dissolved solids (TDS), alkalinity, bicarbonates, chloride, barium, boron, copper, sodium, vanadium, and zinc. Drilling mud is delivered to the site by registered haulers in either 100-barrel capacity vacuum trucks or 14-cubic yard capacity dump trucks. Upon delivery, the Discharger samples and analyzes the drilling mud for Temperature, pH, Electrical Conductivity (EC), TDS, and visually inspects for oil and grease. If the mud is acceptable, it is then discharged directly to an unlined bermed area. Following discharge, the trucks proceed to a concrete lined washout area where they are cleaned with a high-pressure washer. Truck wash water is collected in a sloped concrete lined basin and channeled to portable tanks, then spread at a rate of 0.25 gallons per square foot over a zone previously treated with drilling mud.

Currently the Facility is separated into 10 application areas, four test plots, and a reserve area. The Discharger has been using the test plots to grow kanota oats and compare crop yields in fields where drilling mud is applied at 8, 12, 16, and 24 percent discharge rates. Crop yields, over seven years of initial experimentation, indicate that an application of drilling mud up to 16 percent provides the greatest crop yield. A loading rate of 24 percent results in a decrease in crop yield.

The Discharger performs agronomic soil testing annually to determine the appropriate quantity and quality of fertilizer to apply to the crop fields. Soil samples are collected from one location within each test plot and in each area that is receiving drilling mud. The samples are analyzed for primary, secondary, and micro nutrients, in addition to pH, salinity, sodium absorption ration (SAR), and moisture content. The resulting concentrations of the agronomic parameters throughout the test plots (8 percent to 24 percent), and current field application, do not vary significantly from field to field.

The Discharger developed a Facility Cropping Plan to identify crops to be grown, determine harvesting procedures, and present nitrogen and TDS removal rates. According to the Cropping Plan, Kanota Oats will be planted in the fall and harvested in May and June. Drilling mud is applied throughout the year to specific fields. In November, Kanota Oats and 200 pounds of ammonium sulfate per acre are aerially applied over 240 acres. An additional 150 pounds of ammonium sulfate per acre may be top dressed, if spring precipitation is adequate. The fields are not manually irrigated; therefore, winter precipitation is the only water source. According to the Cropping Plan, the calculated removal rate for nitrogen is approximately 40 percent and plant utilization of the drilling mud metals is limited.

DETECTION MONITORING SYSTEMS

VADOSE ZONE

The Discharger has installed a vadose zone monitoring network, which consists of thirty 2.5-feet deep suction lysimeters, three 5-feet deep suction lysimeters, and two gypsum block arrays with moisture blocks installed at 3-feet, 5-feet, and 10-feet below ground surface. Two 2.5-feet deep lysimeters are present in each field, except in Field L, which contains three 2.5-feet deep lysimeters, and the untreated area (southeast of area of property), which contains only one 2.5-feet deep lysimeter, L-U. Each lysimeter within a pair is located

approximately 20 feet apart and is identified by east/west or north/south markings (e.g. L-Le and L-Lw), with respect to their geographic location to one another.

The data obtained from the vadose zone monitoring network may be utilized, in part, to determine the attenuation of salts through the unsaturated zone, due to the addition of drilling mud. One of the deep lysimeters (DL-M), located at the edge of Field M, historically shows greater concentrations of TDS and EC; however, a comparison of the background groundwater quality to compliance points in the vadose zone and groundwater indicates that no significant impacts to groundwater have occurred from the Discharger's Facility and that constituents found in drilling mud have not migrated through the unsaturated zone.

According to recent quarterly groundwater monitoring reports, many of the lysimeters are damaged and/or non-functional and have not produced a sample for some time. However, based on historical records of vadose zone monitoring, the functional lysimeters may provide an adequate vadose zone monitoring network.

These WDRs require the Discharger to assess any damage to the vadose zone monitoring system and evaluate the vadose zone monitoring network to determine if additional lysimeters are necessary to detect the specified water quality parameters. Lysimeters that are currently functional are listed in Table 1.

Table 1

Functional Lysimeters

Lysimeter ID	**Depth (feet bgs)**
DL-U*	5
DL-M*	5
L-M/Un	2.5
L-M/Us	2.5
L-Aw	2.5
L-Cw	2.5
L-Fe	2.5
L-Jw	2.5
L-Ks*	2.5
L-Le*	2.5
L-Lw*	2.5
L-Ln	2.5
24%n	2.5
8%s*	2.5

* produced sufficient volume when last sampled on 1 March 2007

GROUNDWATER

First encountered groundwater at the Facility is approximately 26 feet below ground surface. This is a shallow aquifer consisting of alluvial fan deposits extending to a depth of less than 60 feet. Regional groundwater is approximately 170 feet mean sea level (MSL) or approximately 50 feet below ground surface, and fluctuates approximately 15 feet seasonally. Monitoring wells at the site are completed in the regional aquifer. The average groundwater flow direction is S 29° E, with a gradient of 0.0028 feet/foot. The range of groundwater seepage velocity is calculated to be between 95.4 feet/year and 132.9 feet/year. Recharge of this aquifer may primarily occur from Stony Creek, which lies seven miles north of the site.

The Discharger has installed ten compliance wells (MW-1 through MW-10) and two background monitoring wells (MW-11 and MW-12). The groundwater monitoring well construction details are described in Table 2.

Table 2

Groundwater Monitoring Well Construction Details

Monitoring Well ID	Type	Top of Casing (ft MSL)	Total Depth (ft below top of casing)	Screen Interval (ft below top of casing)
MW-1	compliance	205.26	49.74	29-49
MW-2	compliance	202.72	47.2	u/k
MW-3	compliance	207.84	47.17	30-47
MW-4	compliance	208.56	48.23	u/k
MW-5	compliance	209.85	50.43	u/k
MW-6	compliance	209.14	54.96	u/k
MW-7	compliance	208.83	62.55	u/k
MW-8	compliance	209.02	52.25	u/k
MW-9	compliance	205.99	60.26	u/k
MW-10	compliance	209.85	51.76	30-50
MW-11	background	217.42	51.3	u/k
MW-12	background	213.04	52.51	u/k

u/k = unknown

Drinking water analysis reports from the California Department of Public Health (CDPH) Division of Drinking Water also show increased nitrates in water supply wells throughout Orland. Based on conversations with CDPH staff, increased nitrates may be a result of surrounding agricultural activities. Nitrate as N in Orland water supply wells typically range from 7 mg/L to 15 mg/L.

Land use within 1,000 feet of the site is mainly agricultural. Current aerial photographs indicate a diary (Greenwood Dairy), hydraulically upgradient of the Discharger's Facility, is along the northern and western boundary, with two wastewater ponds located along the western boundary (see Attachment B). Aerial photographs, dated 21 August 1998, show that a dairy did not exist adjacent to the Facility at that time. Manure from dairies contains high salts/TDS and nutrients including nitrogen, ammonia, phosphorus, and potassium compounds. Greenwood Dairy, 6569 County Road 27, Orland, in Glenn County, is currently enrolled under State Water Resources Control Board Industrial Storm Water General Permit Order No. 97-03-DWQ (WDID #5R111019861) and Regional Water Board General WDR Order No. R5-2007-0035 for Existing Milk Cow Dairies (WDID #5S111015863).

Staff review of analytical data submitted by the Discharger, finds that one monitoring well (MW-10), appears to be increasing in TDS and nitrates as NO_3. Monitoring wells, downgradient of the Facility, do not show significantly increasing trends in TDS and Nitrate as NO_3. At this time, staff does not have sufficient information to determine if the increasing TDS and nitrate trends in MW-10 are occurring due to the Discharger's Facility or off-site agricultural operations.

On 1 November 2004, the Discharger developed a Water Quality Protection Standard (WQPS) using an intra-well statistical analysis described in the 1989 U.S. EPA guidance document entitled, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*. The standard deviation and mean for 23 sampling events (26 March 2003 to 30 June 2004) for monitoring wells MW-5, MW-10, MW-11, and MW-12 were computed and these numbers were used to calculate Upper Tolerance Limits (UTL) for each of the parameters tested.

Samples with constituents at concentrations reaching the UTL may indicate that groundwater has been impacted. However, since MW-5 and MW-10 are "compliance" wells, the UTL determined on 1 November 2004 does not represent "background" water quality. These WDRs require the Discharger to assess historic and annual sample results from "background" wells and submit an annual Groundwater Assessment Report to determine whether WQPS are being met.

The Discharger has complied with the requirements set forth in previous WDR Order No. R5-2002-0141.

KB: SAE
1/15/2008