



In 1943, Barium Products Ltd. was purchased by Westvaco Chlorine Products Corporation which subsequently merged with FMC in 1948. From the 1950s to the 1970s, a liquid residue from the processing operations was discharged to unlined evaporation ponds along the western portion of the FMC Site. The approximate boundaries of the former evaporation/disposal ponds are shown on Figure 2.

In 1961, a 4.3-acre parcel at the southwestern corner of the FMC site was purchased by the State of California for highway right-of-way needed to construct SR 99. An aerial photograph from 1957 shows that a portion of the southernmost pond on the FMC property was within the area purchased for right-of-way.

Soil in and around the pond was excavated during construction of SR 99 and stockpiled within the current Caltrans right-of-way at the location of the future State Route 132 West Freeway/Expressway project. Three distinct stockpiles are present at the Site:

- Stockpile 1, located south of Kansas Avenue and west of North Emerald Avenue,
- Stockpile 2, located south of Kansas Avenue, between North Emerald Avenue and SR 99, and
- Stockpile 3, located south of Kansas Avenue and east of SR 99.

In 2006, Caltrans arranged for the installation of monitoring wells MW-1 through MW-8 at locations adjacent to the three stockpiles as shown on Figure 2. General groundwater chemistry analytical results from June and October 2006 groundwater events suggested that two distinct groundwater types are present beneath the Site. A survey of groundwater wells within a one-mile radius of the Site identified 43 existing or former wells; however, there were no active supply wells identified in the general (southeast) flow direction from the Site.

Groundwater monitoring was resumed for the Site with the March 2012 sampling of wells MW-1 through MW-8. Representatives from the DTSC observed the sample collection procedures and collected split samples which were submitted to an alternate laboratory. No notable differences in the concentrations for each reported analyte were evident.

In June 2012, Geocon arranged for the installation of monitoring wells MW-9 and MW-10 at locations that are both upgradient and adjacent to the three stockpiles as shown on Figure 2.

Geocon compared the analytical results from the 2012 to 2014 groundwater sampling events to the following water quality threshold values:

- Primary Maximum Contaminant Levels (MCLs) promulgated by the California Department of Public Health (CDPH); and
- Secondary MCLs promulgated by the CDPH.

The results of the groundwater sampling events show that both dissolved metals and general minerals have predominantly been reported at concentrations less than their respective numeric water quality threshold values. Only nitrates (expressed as nitrogen) in MW-1, MW-5, MW-6, and MW-10 and total dissolved solids (TDS) in wells MW-5, MW-6, and MW-10 have been consistently reported at concentrations that exceed their respective primary or secondary MCLs of 10 and 500 milligrams per liter (mg/l). Manganese has been sporadically reported for various wells at concentrations exceeding the secondary MCL; however, the concentrations have not been consistently elevated for any one well. Based on the lack of polycyclic aromatic hydrocarbons (PAHs) reported for each of the samples analyzed, we requested discontinuation of analysis for PAHs. PAH analysis was discontinued after the

November 2012 sampling event with concurrence from the DTSC.

## Hydrogeologic Characterization

The hydrogeology of the adjacent FMC site has been characterized by numerous studies since the early 1980s. The GeoTrans January 2005 report *Addendum to Comprehensive Remedial Investigations Report, FMC Corporation, 1200 Graphics Drive, Modesto, Stanislaus County, California* (GeoTrans, 2005) provides a description of the FMC site hydrogeology. This description follows:

*“The site is underlain by laterally discontinuous and unconsolidated sand and silty sand associated with the Modesto and Riverbank Formations. First encountered groundwater is approximately 30 feet below ground surface (bgs) under confined to semi-confined conditions. A deeper aquifer is present at a depth of 165 feet bgs and separated from the upper zone by a blue clay aquitard. The upper water bearing unit has been divided into two zones: a shallow zone from first encountered groundwater to 120 feet bgs and a deeper zone from 140 feet bgs to the top of the aquitard. Groundwater flow within the upper zone is toward the southeast under a gradient of 0.002 ft/ft.”*

Monitoring wells MW-1 through MW-10 were installed into the unconsolidated sand, silty sand and silt layers within the Modesto Formation underlying the Site. The wells were completed within the shallow zone of the upper aquifer (shallow zone).

The lithology encountered in the borings for the wells includes interbedded (laterally discontinuous) sands, silts, and clays. In the areas investigated, the unsaturated (vadose) zone was dominated by silty soils. The shallow zone groundwater beneath the stockpiles was encountered at approximately 35 feet (elevation approximately 50 feet) under unconfined to semi-confined conditions. Based on historical depth to water measurements from the Site, the groundwater flow direction in the shallow upper aquifer is generally toward the southeast with hydraulic gradients varying from 0.0006 to 0.004. The shallow aquifer conditions beneath the Site and the adjacent FMC site appear similar and representative of conditions in the local area.

## APRIL 2015 FIELD ACTIVITIES

This section describes the field activities performed for the April 2015 monitoring event.

### Depth to Groundwater Measurements

On April 30, 2015, prior to opening the wells, Geocon observed each of the ten well boxes for signs of potential tampering or required maintenance. No signs of tampering were observed nor was maintenance of the well boxes required. We measured the depth to groundwater in each well and oxygen-reduction potential (ORP) in monitoring wells MW-1, MW-2, MW-4, and MW-7 using a battery-operated water level meter and an Oakton ORP meter. Depth to water measurements were obtained from a surveyed reference point at the top of the well casings (TOC). Monitoring wells MW-3, MW-5, MW-8, MW-9, and MW-10 were dry.

In April 2015, depth to groundwater at the Site ranged from 36.85 (MW-1) to 41.26 (MW-7) feet below TOC. Based on the groundwater elevation data, the groundwater flow is toward the south at an average gradient of 0.004, which is generally consistent with historical flow. A summary of the TOC elevations, depth to groundwater measurements and groundwater elevations is on Table 1. Groundwater elevation contours, flow direction and gradient are depicted on Figure 3, Groundwater Elevation and Ionic Composition Map – April 2015. A gradient rose diagram depicting historical flow direction and gradient is included on Figure 3.

## **Well Purging and Sampling**

On April 30, 2015, Geocon purged approximately three well volumes of water (1.25 to 4 gallons) from groundwater monitoring wells MW-1, MW-2, MW-4, and MW-7 using disposable bailers. We attempted to purge water from MW-6, however, there was insufficient water in the monitoring well to purge and sample.

The pump was decontaminated before and after each use by washing in an Alconox™ solution followed by fresh and distilled water rinses. During the well purging activities, the groundwater was monitored for pH, electrical conductivity, and temperature. This information is included on the Monitoring Well Sampling Data sheets in Appendix A.

Following well purging, groundwater samples were collected from each of the wells using disposable bailers and decanted through slow emptying devices into laboratory-provided sample containers. The groundwater samples collected for dissolved metals analysis were filtered using a hand-pressure pump through a 0.45-micron filter while filling the container. The samples were sealed, labeled, placed in a chilled cooler and subsequently transported to the laboratory using chain-of-custody protocol.

Purged groundwater was placed into one Department of Transportation-approved, 17-H, 55-gallon drum and transported offsite to Geocon's Rancho Cordova office pending receipt of analytical results. The purge water was then disposed of at Inviro-Tec Disposal in Lincoln, California, on June 1, 2015.

## **ANALYTICAL METHODS AND RESULTS**

### **Laboratory Analysis**

The groundwater samples were delivered to Advanced Technology Laboratories (ATL) for the following analyses under chain-of-custody protocol:

- Title 22 dissolved metals (including strontium) following United States Environmental Protection Agency (EPA) Test Methods 6020/7470;
- Dissolved calcium, magnesium, potassium and sodium by EPA Test Method 6020;
- Chloride, nitrate as nitrogen and sulfate by EPA Test Method 300.0;
- Sulfide by Standard Method (SM) 4500;
- TDS by SM 2540C; and
- Total alkalinity, bicarbonate alkalinity, carbonate alkalinity by SM 2320B.

Groundwater analytical results for this monitoring event are summarized on Tables 2 and 3. The laboratory reports and chain-of-custody documentation are in Appendix B.

## Analytical Results

### Dissolved Metals

Analytical results for dissolved metals along with their associated numeric water quality thresholds are summarized on Table 2. Plots of barium, lead and strontium concentrations vs. time are presented as Figures 4 through 6.

DTSC has identified barium, lead and strontium as the primary chemicals of concern in groundwater for the Site. For the April 2015 groundwater samples, barium and strontium were reported for each of the four groundwater samples. Lead was not reported at concentrations equal to or greater than the respective practical quantitation limit (PQL) in each of the four samples. The ranges of barium and strontium concentrations reported for the April sampling event are in the following table:

Dissolved Metal	High Concentration	Low Concentration	Numeric Water Quality Threshold
Barium (µg/l)	150 (MW-1 and MW-4)	100 (MW-2)	1,000 <sup>(1)</sup> / 700 <sup>(2)</sup>
Strontium (µg/l)	1,300 (MW-1)	760 (MW-2)	4,000 <sup>(2)</sup>

<sup>(1)</sup> = California Department of Public Health Primary MCL for Drinking Water

<sup>(2)</sup> = EPA Drinking Water Health Advisory

µg/l = Micrograms per liter

Antimony, beryllium, cadmium, cobalt, copper, selenium, silver, thallium, zinc, and mercury were not reported at concentrations equal to or greater than their respective PQLs in samples from each well. As shown in the following table, the dissolved metals chromium and vanadium were reported for each of the samples collected with the following ranges:

Dissolved Metal	High Concentration	Low Concentration	Numeric Water Quality Threshold
Chromium (µg/l)	7.1 (MW-4)	5.5 (MW-1)	50 <sup>(1)</sup>
Vanadium (µg/l)	25 (MW-7)	21 (MW-1)	50 <sup>(2)</sup>

<sup>(1)</sup> = California Department of Public Health Primary Maximum Contaminant Level for Drinking Water

<sup>(2)</sup> = California Department of Public Health Notification Level for Drinking Water

Although concentrations of barium, chromium, strontium and vanadium were reported for the samples collected from each well, none of the reported concentrations exceed their respective numeric water quality thresholds for drinking water.

Molybdenum and nickel were reported for three of the four samples collected, arsenic was reported for two of the four samples collected, and manganese was reported for one of the four samples collected. The following table summarizes the dissolved arsenic, manganese, molybdenum, and nickel concentrations reported for the listed samples:

Dissolved Metal	High Concentration	Low Concentration	Numeric Water Quality Threshold
Arsenic (µg/l)	2.5 (MW-7)	2.2 (MW-2)	10 <sup>(1)</sup>
Manganese (µg/l)	33 (MW-7)	33 (MW-7)	50 <sup>(2)</sup>
Molybdenum(µg/l)	1.1 (MW-7)	0.59 (MW-1)	40 <sup>(3)</sup>
Nickel (µg/l)	3.6 (MW-1)	2.9 (MW-2)	100 <sup>(1)</sup>

<sup>(1)</sup> = California Department of Public Health Primary Maximum Contaminant Level for Drinking Water

<sup>(2)</sup> = California Department of Public Health Secondary Maximum Contaminant Level (taste and odor)

<sup>(3)</sup> = EPA Drinking Water Health Advisory

Although concentrations of arsenic, manganese, molybdenum, and nickel were reported for the samples collected from site monitoring wells, none of the reported concentrations exceed their respective numeric water quality thresholds for drinking water.

### **General Minerals/Stiff Diagrams**

To further characterize the geochemistry of the groundwater, general minerals analyses were conducted and included the following constituents:

- dissolved calcium
- dissolved magnesium
- chloride
- nitrate as nitrogen
- sulfate
- dissolved potassium
- dissolved sodium
- sulfide
- total alkalinity
- TDS

General groundwater chemistry provides information regarding the origin and geochemical nature of the groundwater sampled. The analytical results for the major cation (dissolved sodium, potassium, calcium and magnesium) and anion species (chloride, bicarbonate alkalinity reported as calcium carbonate, and sulfate) were used to create Stiff diagrams. Stiff diagrams provide a graphical display of ionic content and can be used to characterize and evaluate the relative composition of groundwater and its consistency or variability. Groundwater with different cation/anion concentrations will result in Stiff diagrams of different shapes and sizes. Stiff diagrams can also help to illustrate mixing of water with different compositions or origins. The presence of more than one water type can be an indication of influences due to hydrogeologic variation or from other sources including man-made impacts.

Appendix C contains Stiff diagrams constructed using site groundwater data for April 2015. The diagrams show that groundwater sampled in each monitoring well is bicarbonate (HCO<sub>3</sub>) dominant. However, variations in the sodium and potassium (Na+K) and calcium composition are readily apparent. The variations are seen primarily in the sodium content with the potassium

concentrations being less variable. The samples from wells MW-1, MW-2, MW-4, and MW-7 had a calcium-dominant composition for the April 2015 sampling event.

Nitrate as nitrogen and TDS were both reported for each of the four groundwater samples, with nitrate as nitrogen concentrations ranging from 7.0 (MW-4) to 17 mg/l (MW-1) and TDS concentrations ranging from 490 (MW-2 and MW-7) to 660 mg/l (MW-1). The reported nitrate concentrations for samples from MW-1 and MW-2 exceed the primary MCL for nitrate of 10 mg/l, and the reported TDS concentrations for samples from MW-1 and MW-4 exceed the secondary MCL for TDS of 500 mg/l. Noteworthy is that MW-1 is an upgradient monitoring well; thus, the reported nitrate concentration of 17 mg/l may be indicative of natural background nitrate concentrations for the shallow groundwater in the vicinity of the Site. Sulfide was reported for the samples collected from wells MW-1, MW-2, MW-4, and MW-7 at concentrations ranging from 0.015 (MW-2) to 0.13 mg/l (MW-1).

The analytical results for general minerals are summarized on Table 3.

### **Laboratory Quality Assurance/Quality Control**

Geocon reviewed the analytical laboratory quality assurance/quality control (QA/QC) provided with the laboratory report. The laboratory data show that the method blank surrogate recoveries are acceptable and that concentrations of selected analytes were not reported at concentrations equal to or greater than their respective PQLs for each method blank for each analysis. Appropriate recoveries were noted for each laboratory control sample for each analysis. Several matrix spike/matrix spike duplicate (MS/MSD) analytes had recoveries or relative percent differences outside of laboratory control limits; however, the sample results were validated by the laboratory control samples. No qualification of the data is necessary, and the data are considered of sufficient quality for the purposes of this report.

### **GeoTracker Submittal**

The laboratory prepared electronic data files for submittal to the State Water Resources Control Board GeoTracker database. The GeoTracker database is accessible via the GeoTracker website at <http://geotracker.waterboards.ca.gov>. The electronic data was uploaded to GeoTracker on April 8, 2014. The confirmation numbers are 3304460644, 1442300021 and 8015052139.

## **CONCLUSIONS AND RECOMMENDATIONS**

None of the reported dissolved metals concentrations for the groundwater samples collected in April 2015 exceeded their respective numeric water quality threshold values.

With the exception of nitrate in the samples collected from wells MW-1 and MW-2, none of the reported general minerals for the groundwater samples collected in April 2015 equaled or exceeded their respective California primary MCLs. TDS was reported at concentrations exceeding the secondary MCL of 500 mg/l for the samples collected from wells MW-1 and MW-4.

Barium and strontium were reported for the April 2015 groundwater samples at concentrations similar to historical levels and remained significantly less than their numeric water quality thresholds. The remaining dissolved metals were also reported at concentrations similar to historical levels.

Stiff diagrams for the 2012 through April 2015 groundwater sampling events show that very slight changes in ionic content have occurred since groundwater sampling resumed at the Site in March 2012. Water samples from wells MW-1, MW-2, MW-4, and MW-7 have consistently been reported as calcium-dominant. Groundwater monitoring is currently performed annually, with the

next monitoring event scheduled for April 2016. Depth to water measurements will be collected semi-annually, with the next event scheduled for October 2015.

We appreciate the opportunity to provide our services on this project. Please contact us if you have any questions concerning the contents of this Report or if we may be of further service.

Sincerely,

**GEOCON CONSULTANTS, INC.**



Rebecca L. Silva  
Project Manager



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- (1) Addressee
- (1) Caltrans, Grace Magsayo
- (1) DTSC, Randy Adams
- (1) CVRWQCB, Steve Meeks

- Attachments:
- Figure 1, Vicinity Map
  - Figure 2, Site Plan
  - Figure 3, Groundwater Elevation and Ionic Composition Map – April 2015
  - Figure 4, Barium Concentrations vs. Time
  - Figure 5, Lead Concentrations vs. Time
  - Figure 6, Strontium Concentrations vs. Time
  
  - Table 1, Groundwater Elevation Data
  - Table 2, Summary of Groundwater Analytical Results – Title 22 Metals (Dissolved)
  - Table 3, Summary of Groundwater Analytical Results – General Minerals and PAHs
  - Table 4, Well Construction Details
  
  - Appendix A, Monitoring Well Sampling Data Sheets
  - Appendix B, Laboratory Reports and Chain-of-custody Documentation
  - Appendix C, Stiff Diagrams



## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-1	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 44 feet	Screened Casing Length: 10 feet
Well Elevation: 80.39 feet above MSL	Water Elevation: 43.54 feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: 36.85 ft.	2 in. = .1632 gal/ft. 4 in. = .6528 gal/ft.
Calculated Water Column Volume: 1.17 gal.	Volumes Purged: 3.4
Start Purging Time: 1133	End Purging Time: 1140
Total Time: 7 min.	Flow Measurement: 5-gal bucket
Total Volume Purged: 4 gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness: inches

SAMPLING CHARACTERISTICS				
Purging Method: Disposable Bailer		Sampling Method: Disposable Bailer		
Laboratory Analysis: General Minerals, Title 22 Dissolved Metals				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
1135	26.5	810	6.79	2
1137	25.1	854	7.26	3
1140	23.3	924	7.08	4
1150				Sample

Comments: Turbid.
ORP = 65 millivolts.

## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-2	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 40 feet	Screened Casing Length: 10 feet
Well Elevation: 81.25 feet above MSL	Water Elevation: 43.46 feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: 37.79 ft.	2 in. = .1632 gal/ft. 4 in. = .6528 gal/ft.
Calculated Water Column Volume: 0.36 gal.	Volumes Purged: 3.5
Start Purging Time: 1110	End Purging Time: 1116
Total Time: 6 min.	Flow Measurement: 5-gal bucket
Total Volume Purged: 1.25 gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness: inches

SAMPLING CHARACTERISTICS				
Purging Method: Disposable Bailer		Sampling Method: Disposable Bailer		
Laboratory Analysis: General Minerals, Title 22 Dissolved Metals				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
1112	26.8	708	6.86	0.5
1114	24.2	686	6.93	0.75
1116	22.7	697	6.97	1.25
1125				Sample

Comments: Clear; no odors.
ORP = 75 millivolts.



## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-4	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 42 feet	Screened Casing Length: 10 feet
Well Elevation: 82.47 feet above MSL	Water Elevation: 43.27 feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: 39.20 ft.	2 in. = .1632 gal/ft. 4 in. = .6528 gal/ft.
Calculated Water Column Volume: 0.46 gal.	Volumes Purged: 3.0
Start Purging Time: 1235	End Purging Time: 1241
Total Time: 6 min.	Flow Measurement: 5-gal bucket
Total Volume Purged: 1.4 gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness: inches

SAMPLING CHARACTERISTICS				
Purging Method: Disposable Bailer		Sampling Method: Disposable Bailer		
Laboratory Analysis: General Minerals, Title 22 Dissolved Metals				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
1237	26.8	851	6.69	0.5
1239	25.0	802	6.73	1
1241	23.0	803	7.10	1.4
1255				Sample

Comments: Clear; no odor.
ORP = 9 millivolts.

## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-5	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 45 feet	Screened Casing Length: 10 feet
Well Elevation: 87.78 feet above MSL	Water Elevation: feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: DRY ft.	2 in. = .1632 gal/ft.    4 in. = .6528 gal/ft.
Calculated Water Column Volume: gal.	Volumes Purged:
Start Purging Time:	End Purging Time:
Total Time: min.	Flow Measurement: 5-gal bucket
Total Volume Purged: gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness:        inches

SAMPLING CHARACTERISTICS				
Purging Method:			Sampling Method:	
Laboratory Analysis:				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
				Sample

Comments: DRY.

## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-6	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 46.5 feet	Screened Casing Length: 10 feet
Well Elevation: 84.52 feet above MSL	Water Elevation: 43.31 feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: 41.21 ft.	2 in. = .1632 gal/ft. 4 in. = .6528 gal/ft.
Calculated Water Column Volume: 0.86 gal.	Volumes Purged:
Start Purging Time:	End Purging Time:
Total Time: min.	Flow Measurement: 5-gal bucket
Total Volume Purged: gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness: inches

SAMPLING CHARACTERISTICS				
Purging Method: Disposable Bailer		Sampling Method:		
Laboratory Analysis:				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
1002	22.0	892	6.45	0.5

Comments: Attempted to purge (0.3 gallon removed), well did not recharge. Insufficient water in well to purge and sample.

## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-7	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 48 feet	Screened Casing Length: 10 feet
Well Elevation: 83.74 feet above MSL	Water Elevation: 47.25 feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: 41.26 ft.	2 in. = .1632 gal/ft.    4 in. = .6528 gal/ft.
Calculated Water Column Volume: 1.10 gal.	Volumes Purged: 3.2
Start Purging Time: 1009	End Purging Time: 1015
Total Time: 6 min.	Flow Measurement: 5-gal bucket
Total Volume Purged: 3.5 gal.	Avg. Flow Rate:    gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness:    inches

SAMPLING CHARACTERISTICS				
Purging Method: Disposable Bailer			Sampling Method: Disposable Bailer	
Laboratory Analysis: General Minerals, Title 22 Dissolved Metals				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
1011	20.8	711	6.95	1
1013	20.8	708	7.23	2
1015	21.6	710	7.25	3.5
1025				Sample

Comments: Clear, no odor.
ORP = 22 millivolts.

## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-8	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 45 feet	Screened Casing Length: 10 feet
Well Elevation: 83.85 feet above MSL	Water Elevation: feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: DRY ft.	2 in. = .1632 gal/ft.    4 in. = .6528 gal/ft.
Calculated Water Column Volume: gal.	Volumes Purged:
Start Purging Time:	End Purging Time:
Total Time: min.	Flow Measurement: 5-gal bucket
Total Volume Purged: gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness: inches

SAMPLING CHARACTERISTICS				
Purging Method:			Sampling Method:	
Laboratory Analysis:				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
				Sample

Comments: DRY



## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-9	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 40 feet	Screened Casing Length: 10 feet
Well Elevation: 82.53 feet above MSL	Water Elevation: feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: DRY ft.	2 in. = .1632 gal/ft.    4 in. = .6528 gal/ft.
Calculated Water Column Volume: gal.	Volumes Purged:
Start Purging Time:	End Purging Time:
Total Time: min.	Flow Measurement: 5-gal bucket
Total Volume Purged: gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness:        inches

SAMPLING CHARACTERISTICS				
Purging Method:			Sampling Method:	
Laboratory Analysis:				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
				Sample

Comments: DRY.

## MONITORING WELL SAMPLING DATA

<b>Project Name:</b> Caltrans Modesto Soil Stockpiles	<b>Project Number:</b> S9800-01-17
Well No.: MW-10	Date: 4/30/2015
Well Diameter: 2 in.	Field Personnel: CD/JE
Casing Length: 40 feet	Screened Casing Length: 10 feet
Well Elevation: 83.97 feet above MSL	Water Elevation: feet above MSL

PURGE CHARACTERISTICS	
Water Depth Before Purging: DRY ft.	2 in. = .1632 gal/ft.    4 in. = .6528 gal/ft.
Calculated Water Column Volume: gal.	Volumes Purged:
Start Purging Time:	End Purging Time:
Total Time: min.	Flow Measurement: 5-gal bucket
Total Volume Purged: gal.	Avg. Flow Rate: gpm
Dissolved Oxygen: mg/l	Free Product: (N); Thickness: inches

SAMPLING CHARACTERISTICS				
Purging Method:			Sampling Method:	
Laboratory Analysis:				
TIME	TEMPERATURE (°C)	CONDUCTIVITY (µmhos/cm)	pH	Gallons Purged
				Sample

Comments: DRY.