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TANK CLOSURE REPORT

Southern Pacific Transportation Company
1450 Sherwin Avenue
Emeryville, California

IC Project No. 05100680

Prepared For:

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Southern Pacific Transportation Company
1450 Sherwin Avenue
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1.0 INTRODUCTION

Industrial Compliance (IC), on behalf of Southern Pacific Transportation Company (SPTCo), observed the removal of four underground storage tanks (USTs) on SPTCo right-of-way between July 25, 1994 and August 5, 1994. The USTs were located adjacent to the Sherwin-Williams Company (Sherwin-Williams) facility at 1450 Sherwin Street in Emeryville, California (see Figure 1). During access road improvements performed by a contractor for Sherwin-Williams, a vertical pipe was encountered in the subsurface which contained a petroleum substance. A representative of Sherwin-Williams informed SPTCo of the discovery. SPTCo maps of the area indicated that four USTs which contained Bunker C fuel were in the vicinity of the pipe. Bunker C (diesel #6) was used in the early 1900's to fuel steam locomotives.

Subsequent excavation of the area revealed four former, approximately 6,500 gallon, steel railcar tankers. The tankers were converted to USTs and interconnected with piping that was routed to the vertical pipe. The following sections describe the procedures that were used to remove the USTs, the site conditions, and recommendations for additional site action.

Excavation and removal of the USTs was observed by the Alameda County Department of Environmental Health (County) and the City of Emeryville Fire Department.

3.0 GEOLOGY AND HYDROGEOLOGIC CHARACTERISTICS

The site is located in the eastern portion of the San Francisco Bay Area in west-central California. The subsurface geology is comprised primarily of alluvial and bay sediments deposits. The site topography is relatively flat with surface drainage to the west into the San Francisco Bay. Soil lithology consists predominantly of clay and silty fine sands from ground surface to 12 feet below ground surface (bgs).

3.1 Levine-Fricke Investigation Findings

According to data collected by Levine-Fricke, two ground water zones were encountered. A shallow zone (A-zone) was encountered at a depth of 6 to 12 feet bgs and deeper ground water zone (B-zone) at a depth of 28 to 38 feet bgs. Ground water in the A-zone is present in 2 to 5 feet thick beds of sand and/or gravel interbedded with less permeable silty clayey sediments. The A-zone is overlain by a 5 to 6 foot thick confining to semi-confining layer of silty clay and gravelly silty clay sediments. Below the A-zone is a silty clay interval 10 to 18 feet thick. This clay-rich interval has a low permeability and acts as an aquitard to form a confining layer that separates the A-zone from the B-zone. The B-zone consists of a thick interval of well sorted, coarse-grained, sand and gravel units interbedded with some silty clay sediments.

Depth to ground water in January 1994 was approximately 6 feet bgs and flow direction calculated to the west at a gradient of 0.003.

4.0 FIELD PROCEDURES AND OBSERVATIONS

This section discusses the field procedures that were used to locate, excavate and remove the four USTs. Also discussed are the field observations recorded during the site work.

4.1 UST Location, Excavation and Removal

SPTCo contracted Granite Construction Company (Granite) to remove the USTs. During the week of July 18, Granite uncovered the four USTs, and assessed that the tanks were full of Bunker C oil. The USTs were located between a 7 inch thick concrete slab on the Sherwin-Williams property and a recently constructed SPTCo rail spur. Three of the riveted steel USTs were 31 feet long by 6 feet in diameter and the fourth UST (T1) was 27 feet long and 6 feet in diameter (see Figure 3). All of the USTs had 3/8-inch thick walls.

H & H Environmental Systems (H & H) was subcontracted by Granite to remove the Bunker C fuel from the USTs and to recycle the USTs after removal. During the week of July 25, 1994, the Bunker C fuel was pumped from the USTs by heating the Bunker C to approximately 110° fahrenheit with steam. The Bunker C was then pumped into tanker trucks and transported to Enviropur West Corporation, in Patterson, California, for recycling. A total of 30,450 gallons of Bunker C and water was removed from the tanks and recycled. Copies of manifests are included in Appendix A.

Soil was excavated around the tanks to remove overburden soil from above and around the USTs. The visually impacted soil was stockpiled on site and encased in plastic sheeting. Ground water was encountered at 8 feet bgs and the bottom third of the USTs were submerged. As the Bunker C was removed the USTs began to float. Metal bars were used to bolt the USTs together and keep them from rolling in the excavation.

On August 3, 1994, the USTs were removed from the excavation. A visual inspection of the four USTs indicated no holes or pitting and all appeared to be intact and in good condition. The 12-inch manifold connection port on each tank was sealed using plastic and rope, and any loose material was removed from the hulls of the tanks. The tanks were then placed on a flatbed trailer and fastened with heavy straps. After fastening, wooden sideboards were placed around the perimeter of the flatbed to secure the tanks during transport. The USTs were transported to the H & H facility in San Francisco, California for recycling.

4.2 Confirmation Soil Sampling

Eight confirmation soil samples were collected from the sidewalls of the excavation approximately 7 feet bgs. Soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-G), TPH as diesel (TPH-D), and Bunker C oil (TPH-B) using EPA Method 8015-Modified; benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020; oil and grease using EPA Method 5520, chlorinated solvents using EPA Method 8010; semivolatile organics extracted by the Waste Extraction Test (WET) and analyzed by EPA Method 8270; and leachable semivolatile organics extracted by the WET with deionized water and analyzed by EPA Method 8270 for analysis. The sample locations are shown on Figure 4. A summary of analytical results is presented in Section 0.0.

Samples were collected by placing a ladder into the excavation and driving a 2-inch diameter 6-inch long brass tube into the sidewall soil and removing it. The soil samples were labeled, sealed with Teflon sheets and plastic caps, logged onto a chain-of-custody form, and immediately placed in an iced cooler at 40°F for transport to Pace Incorporated analytical laboratories, in Novato, California.

4.3 Ground Water Sampling

Two ground water samples were collected from the south end of the excavation. An 8-foot ladder was lowered into the excavation. The ladder rested on the bottom of the excavation below ground water and along the top of the sidewall. Samples were collected by using a disposable bailer and transferred into the sample bottles by inserting a sample port into the bottom of the bailer. Sample bottles were labeled, placed in a cooled ice chest and transported to Pace, Inc. analytical laboratory in Novato, California. A chain-of-custody form was completed and accompanied the sample upon shipment to the laboratory.

The two samples were composited at the laboratory and analyzed for TPH-G, TPH-D, and Bunker C oil using EPA Method 8015 Modified; BTEX using EPA Method 8020; oil and grease using EPA Method 5520; chlorinated solvents using EPA Method 8010; and semivolatile organics using EPA Method 9270. A summary of the analytical results is presented in Section 0.0.

4.4 Soil Disposal

Approximately 250 cubic yards of Bunker C impacted soil was excavated and stockpiled on site. Three soil samples were collected and composited in the laboratory for analysis. The composite sample was analyzed by EPA 7000 Method series for soluble arsenic and lead after extraction using the Toxic Characteristic Leaching Procedure (TCLP) method. Arsenic was detected at a concentration of 0.006 milligrams per liter (mg/L) and lead at a concentration of 1.1 mg/L, as shown in Table 1. Approximately 15 cubic yards of metal piping associated with the USTs was segregated and stockpiled. The soil and piping will be loaded into rail cars and transported to Utah for disposal at the East Carbon Disposal Corporation (ECDC) landfill.

4.5 Proposed Backfill Procedures

The perimeter of the open excavation is currently secured with temporary fencing. Upon approval by the County, the excavation will be backfilled using a combination of rock and soil. The rock will be placed from the bottom of the excavation to the level of ground water. A geotextile fabric will then be laid over the rock. This will minimize soil backfill migration into the rock layer. The first soil lift placed on top of the fabric will be 24 inches thick prior to compaction. Subsequent lifts will not exceed 12 inches prior to compaction. The soil will be relatively non-expansive and compacted to a minimum of 90 percent of its maximum dry density. Soil compaction will be monitored and tested by BSK & Associates.

5.0 ANALYTICAL TEST RESULTS

Analytical test results of soil and water samples collected are summarized in Tables 2 through 6. The laboratory reports are presented in Appendix C.

5.1 Confirmation Soil Samples

Soil TPH-G concentrations range from nondetect to 18 milligrams per kilogram (mg/kg); however, no concentrations of BTEX were detected. Soil TPH-D concentrations range from nondetect to 4,400 mg/kg. Oil and grease concentrations range from nondetect to 7,700 mg/kg. All of the samples had detectable concentrations of Bunker C ranging from 8.4 mg/kg to 28,000 mg/kg. One of the eight samples (T4) has minor concentrations of extractable organics acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, and pyrene. These are common polynuclear aromatic hydrocarbons (PAHs) found in lower grade diesel fuels such as Bunker C.

Samples T2T4 and T1T3 were also analyzed by the WET using deionized water and EPA Method 8270. Analysis indicated that neither sample contained any detectable concentrations of extractable organics.

5.2 Water Sample

One composite water sample was analyzed for organic and inorganic constituents. Detected organic constituents were TPH-G, benzene, toluene, xylenes, TPH-D, TPH-B and acenaphthene. Of the inorganic constituents, concentrations of arsenic, barium, and lead were detected at 0.018 mg/L, 0.16 mg/L, and 0.028 mg/L, respectively.

6.0 DATA INTERPRETATION AND CONCLUSIONS

The following discussion is based on the field observations, analytical results, and a review of Levine-Fricke reports: *Evaluation of Interim Remedial Measures at the Sherwin-Williams Facility Emeryville, California* (December 20, 1991), and *Report of Semiannual Ground-Water Monitoring For the Period from July 1 through December 31, 1993 The Sherwin-Williams Plant Emeryville, California* (June 10, 1994).

6.1 Soil

Observations and the results of excavation confirmation sampling indicate that Bunker C impacted soil remains on all sides of the excavation with the highest concentrations detected in the northwest and southwest corners of the excavation. The limits of the excavation could not be expanded due to physical site constraints, i.e., railroad tracks to the west and the concrete slab and slurry wall to the east.

IC has extensive experience with Bunker C in various media and has observed that Bunker C is relatively immobile in soil and insoluble in ground water. In addition, toxicologic studies (Health Based Cleanup Levels for San Luis Obispo Site, July 1990, Terra, Inc.) have indicated that the health based risks of exposure to Bunker C are minimal and soil cleanup levels, based on a one in one million increase in cancer risk, have been calculated to be approximately 10,000 mg/kg. To assess the potential for contaminants to leach from the soil, the WET was performed on the eight sidewall samples and the extracts were analyzed by EPA Method 8270. Only one sample had detectable concentrations of any of the semivolatile compounds (acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, and pyrene). The detected concentrations of these compounds are below the EPA Region IX Preliminary Remediation Goals (PRGs) set forth on August 1, 1994. In addition, two of the sidewall samples (T2T4 and T1T3) were extracted by the WET using deionized water to more closely resemble site conditions and then analyzed by EPA Method 8270. The analytical results indicated no detectable concentrations of semivolatile compounds. The WET analyses were performed to illustrate the relative non-leachability and immobility of Bunker C in soil.

The remaining Bunker C is located below ground surface in an industrial area with limited access. The majority of the former USTs location will be covered by an access driveway to the Sherwin-Williams property or by railroad track ballast. IC recommends no further action and that the excavation be backfilled pursuant to Section 2.4 of this report.

6.2 Water

The highest concentration of hydrocarbons detected in the grab water sample collected from the excavation was 6.1 mg/L of Bunker C carbon chain range hydrocarbon (TPH-B). Results from this sample may be unrepresentatively high due to the method of collection and the potential for residual product from the tanks or soil to be collected with the sample. BTEX compounds were below California Maximum Contaminant Levels (MCLs) except for benzene which exceeded the MCL by 0.0002 mg/L.

Installation of remedial measures, as well as ground water monitoring, is on going at the Sherwin-Williams site for petroleum hydrocarbons, solvents, and arsenic. Ground water quality data from Levine-Fricke ground water monitoring wells LF-9, LF-10, LF-11, LF-12, LF-14, LF-15 and LF-16 were reviewed. Tables from the Levine-Fricke's *Report of Semiannual Ground-Water Monitoring For the Period from July 1 through December 31, 1993 The Sherwin-Williams Plant Emeryville, California* (June 10, 1994), summarizing historical water-quality data from the above mentioned wells are included in Appendix D.

Also, a statistical comparison was done on the ground water quality data from the above mentioned wells and a water sample collected from the excavation of the USTs (see Table 7). This statistical comparison shows that the local ground water data collected from the upgradient Sherwin-Williams site, and the water sample collected from the excavation have concentrations within one order of magnitude for benzene, toluene, ethylbenzene, total xylenes, arsenic, and barium. These wells are located within a 200 foot radius of the former USTs (see Figure 2). Historical results from the A-zone wells, dating from June 1991 to January 1994, indicate concentrations of TPH-D ranging from nondetect to 1.5 mg/L and TPH-G ranging from nondetect to 0.7 mg/L.

Although the total dissolved solids (TDS) concentration range (460 mg/L to 870 mg/L, Levine-Fricke, June 10, 1994) of the shallow zone aquifer allows it to be classified as a potential drinking water source, it is unlikely that the aquifer will be developed for any beneficial use due to its shallow depth and the presence of and potential for contamination from the many industries in the area. Also, the potential for contaminants to migrate in ground water from the A-zone (see Section 0) to a deeper ground water zone is minimal due to the 10- to 18-foot thick low permeability confining layer.

The dissolved constituents in the grab water sample are either near or below the MCLs and PRGs, the impact has not migrated off site, the health risk is virtually non-existent, the aquifer is not developed for beneficial use, and the major source of impact has been removed. Therefore, based on IC's understanding of the San Francisco Bay Regional Water Quality Board's non-attainment area policy, it is recommended that the excavation be backfilled and that monitoring of the nearby wells be continued on a semi-annual basis. IC also understands that Levine-Fricke has proposed to install additional ground water monitoring wells approximately 50 feet west (down gradient) of the former USTs location. These wells could be used for site monitoring.

APPENDIX A

MANIFESTS

APPENDIX C

SOIL AND GROUND WATER ANALYTICAL LABORATORY REPORTS

APPENDIX D

HISTORICAL WATER QUALITY DATA (LEVINE-FRICKE)