REVISED
SUPPLEMENTAL SOIL INVESTIGATION REPORT
JONES CHEMICAL PROPERTY
1401 W. DEL AMO BOULEVARD
TORRANCE, CALIFORNIA

March 31, 2009

Prepared For: **Montrose Chemical Company of California**
600 Ericksen Avenue NE, Suite 380
Bainbridge Island, Washington 98111

Prepared By: **Earth Tech AECOM**
300 Oceangate, Suite 700
Long Beach, California 90802

EARTH TECH | AECOM

Table of Contents

List of Tables

List of Figures

List of Appendices

ACRONYMS

AOC	Administrative order on consent
ASTM	American Society of Testing and Materials
Bgs	Below ground surface
BHC	Benzene hexachloride
CCR	California Code of Regulations
CCV	Continuing calibration verification
CD	Compact disk
CDWR	California Department of Water Resources
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chain-of-custody
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DNAPL	Dense nonaqueous phase liquid
EPA	U.S. Environmental Protection Agency
Earth Tech	Earth Tech AECOM
EDD	Electronic deliverable data
FID	Flame ionization detector
FS	Feasibility study
FSP	Field Sampling Plan
HHSL	Human health screening levels
HPLC	High-performance liquid chromatography
ICV	Initial calibration verification
IDW	Investigation-derived wastes
JCI	Jones Chemical, Inc.
LADWP	Los Angeles Department of Water and Power
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MCB	Monochlorobenzene
MDL	Method detection limit
mg/kg	Milligrams per kilogram
Montrose	Montrose Chemical Corporation of California
MS/MSD	Matrix spike and matrix spike duplicate
MSL	Mean sea level
NAD	North American Datum
NPL	National Priorities List
PARCC	Precision, accuracy, representativeness, comparability and completeness
PD	Playa Deposits
PID	Photoionization detector
PPE	Personal protective equipment
Ppm	Parts per million

PRG	Preliminary remediation goal
PVS	Palos Verdes Sands
QA	Quality assurance
QA/QC	Quality assurance/quality control
QAO	Quality assurance objectives
QAPP	Quality Assurance Project Plan
QASRs	Quality assurance summary reports
QC	Quality control
RI	Remedial Investigation
RI/FS	Remedial investigation and feasibility study
RL	Reporting limit
RPD	Relative percent difference
RWQCB	Regional Water Quality Control Board
SDG	Sample Delivery Group
SSI	Supplemental Soils Investigation
Stauffer	Stauffer Chemical Company
STL	Severn Trent Laboratories, Inc.
TestAmerica	TestAmerica Laboratories, Inc.
UBA	Upper Bellflower Aquitard
USCS	Unified Soil Classification System
UTM	Universal Transverse Mercator
VOC	Volatile organic compounds

1 INTRODUCTION

On behalf of Montrose Chemical Corporation (Montrose), Earth Tech AECOM (Earth Tech) conducted supplemental soil investigation (SSI) activities in 2007 and 2008 at the Jones Chemical, Inc. (JCI) property located at 1401 West Del Amo Boulevard in Torrance, California (**Figure 1**). The JCI property is located adjacent to the Montrose Property, where technical grade dichlorodiphenyltrichloroethane (DDT) was manufactured from 1947 to 1982. Although characterization of soils at the JCI property for the presence of pesticides had been conducted from 1985 to 1995 as part of the Montrose Remedial Investigation (RI) activities, Region 9 of the Environmental Protection Agency (EPA) requested that supplemental soil sampling be conducted to fully delineate the extent of pesticides in shallow soils at the JCI property. This investigation report documents the SSI activities conducted in 2007 and 2008 to complete characterization of pesticides in shallow soils at the JCI property.

In response to EPA's request, Montrose and JCI submitted a proposed investigation scope of work to EPA on June 30, 2004. Montrose and JCI subsequently met with EPA to discuss the proposed investigation scope on July 13, 2004. EPA then conducted site visits to the JCI property on July 22 and August 4, 2004, following which EPA requested that the investigation scope be expanded to address additional characterization objectives (as specified in this report). The *Final Revised Field Sampling Plan* (FSP) *for the Supplemental Soil Investigation for the Montrose Superfund Site* (Earth Tech, 2005a) and the *Revised Quality Assurance Project Plan* (QAPP) for *the Supplemental Soil Investigation for the Montrose Superfund Site* (Earth Tech, 2005b) were subsequently finalized in March 2005 and approved by EPA in letters dated March 16 and 24, 2005. An FSP Addendum specifically addressing characterization of pesticides in soil at the JCI Property was subsequently submitted to EPA on August 17, 2005 (Earth Tech, 2005c). EPA did not initially comment on the FSP Addendum, and it was re-submitted to EPA on February 1, 2007 and again on July 19, 2007. Following review and further discussion with Montrose, EPA conditionally approved the FSP Addendum in a letter dated September 7, 2007. A copy of the EPA conditional approval letter is provided in **Appendix A**. Documentation in compliance with Conditions Nos. 4 and 5 was submitted to EPA on August 15 and September 4, 2007, respectively.

A *Supplemental Soil Investigation Report* for the JCI Property was previously submitted to EPA on October 10, 2008 (Earth Tech, 2008). EPA commented on that report in a letter dated January 16, 2009 (USEPA, 2009). The Supplemental Soil Investigation Report for the JCI Property has been revised in accordance with Montrose responses to EPA comments, provided as an attachment to this report.

1.1 OBJECTIVES

The characterization objectives specific to the supplemental JCI soil investigation were specified in the 2005 FSP Addendum as follows:

1) Characterize lateral and vertical extent of DDT and benzene hexachloride (BHC) concentrations previously detected at the JCI property in shallow soils in excess of the characterization benchmarks.
2) Characterize the lateral and vertical extent of DDT and BHC along historical truck routes that extended across the Montrose and JCI (or Stauffer Chemical Company [Stauffer]) property boundaries.
3) Characterize the lateral and vertical extent of DDT along the JCI property boundaries located west and south of the former Montrose formulating and grinding plant (i.e. areas with surface staining in historical aerial photographs).
4) Characterize the lateral and vertical extent of DDT and BHC along historical stormwater pathways.
5) Characterize the lateral and vertical extent of DDT and BHC in areas potentially affected by aerial dispersion from historical manufacturing operations at the Montrose plant property.

The characterization benchmarks for the supplemental soil investigation were established in Section 3.0 of the March 2005 Final Revised FSP (Earth Tech, 2005a) and Section 2 of the August 2005 FSP addendum (Earth Tech, 2005c) as follows:

- Total DDT = 10 mg/kg (upper limit of site-specific residential background range)
- alpha-BHC = 0.36 mg/kg (EPA Industrial PRG, 2004)
- beta-BHC = 1.3 mg/kg (EPA Industrial PRG, 2004)
- gamma-BHC = 1.7 mg/kg (EPA Industrial PRG, 2004)

Total DDT is defined as the sum of the 2,4’ and 4,4’ isomers of DDT, dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyldichloroethane (DDD). Similarly, Total BHC is defined as the sum of the alpha, beta, delta, and gamma BHC isomers.

In the September 2007 conditional approval letter, EPA identified an additional objective to characterize shallow soils along an inactive 10-inch diameter sewer line, believed to originate from the Montrose Property (Condition No. 3). Although this objective was not assigned a specific characterization number, planned soil borings were re-positioned in order to be located along the inactive sewer line as identified in Section 3.1.

1.2 SCOPE OF WORK

The comprehensive scope of work for the JCI soil investigation included the following (i.e. combined 2007 and 2008 sampling events):

- Sampling of 25 soil borings in 2007 to a target depth of 10 feet below ground surface (bgs);
- Sampling of 9 additional soil borings in 2008 to further delineate pesticides detected in the 2007 borings, including 8 borings to a target depth of 3 feet bgs and 1 boring to a target depth of 20 feet bgs;
- Collection of soil samples at specific target depths of 1, 3, 5, 7, 10, 15, and 20 feet as appropriate (depending on boring depth);
- Laboratory analysis of all samples for pesticides by EPA Method 8081A, including:
    - 143 target soil samples for pesticides
    - 10% duplicate samples;
    - 5% matrix spike/matrix spike duplicate (MS/MSD) samples; and
    - 1 equipment blank sample for each field day of sampling.
- Laboratory analyses of investigation-derived waste (IDW) samples for profiling and characterization of IDW;
- Validation of laboratory results, 10% by Tier 3 and 90% by Tier 2, and
- Preparation of this data report.

1.3 DATA PRESENTATION

Section 2.0 of this soil investigation report provides background information regarding the JCI property. Field activities, including drilling and soil sampling, are summarized in Section 3.0. Laboratory analysis and results of the soil sampling is presented in Section 4.0. Section 5.0 provides a summary of data validation and quality assurance/quality control (QA/QC) issues. Section 6.0 presents IDW results and summarizes waste management activities. Section 7.0 presents recommendations, and references are provided in Section 8.0.

2 SITE BACKGROUND

In 1943, Stauffer Chemical Company purchased 18 acres of land located on Normandie Avenue in Torrance, California, including what are now the Montrose and JCI properties. This property had previously been the Hughes-Mitchell plant and included a sulfuric acid plant. The sulfuric acid plant reportedly used the Manheim furnace process; this process burns or roasts sulfide ore raw material to generate sulfur dioxide. The sulfur dioxide was then reportedly converted to sulfur trioxide, and absorbed in sulfuric acid (Levine-Fricke, 1995). From 1943 until approximately 1952, Stauffer continued to operate the sulfuric acid plant on what is currently the JCI property, but may have switched to producing sulfuric acid by burning sulfur. The sulfuric acid plant was subsequently dismantled after 1965. An aerial photograph of the Stauffer and Montrose Properties from 1952 is provided as **Figure 3**.

JCI leased 5 acres from Stauffer beginning in approximately 1955 for use as an ammonia and chlorine cylinder filling plant. In 1968, JCI purchased the land from Stauffer and continues to operate a bulk industrial chemical plant at the property today. JCI manufactures a variety of industrial chemicals including industrial bleach (sodium hypochlorite) and sodium bisulfite. At various times, JCI has additionally repackaged some industrial chemicals for distribution.

From 1947 to 1982, Montrose leased 13 acres from Stauffer and operated a technical grade DDT manufacturing plant. The Montrose DDT plant was demolished in 1983, and the site was re-graded in 1985 and paved with asphalt. With the exception of some temporary soil storage cells constructed by EPA, the Montrose Property is vacant and asphalt covered.

2.1 SITE LOCATION AND DESCRIPTION

The JCI property is located at 1401 West Del Amo Boulevard, Torrance, California. Although the JCI property is generally referred to as “the Torrance plant”, the property is officially located within the City of Los Angeles, whose limits in this area are Western Avenue to the west and Normandie Avenue to the east. This is an active industrial facility with permanent structures enclosed by a fence with a secured entrance. The entrance to the property is at the southwest corner along Del Amo Boulevard, east of Denker Avenue.

The Montrose Property borders JCI to the north and east. To the south, JCI is bordered by a Los Angeles Department of Water and Power (LADWP) right-of-way, including one electrical substation. To the west, JCI is bordered by a second LADWP electrical substation and a Frito-Lay Corporation distribution facility. The JCI, Montrose, and surrounding properties are shown in **Figure 4**.

The primary structures present at the JCI property are buildings, tanks, process units, and an active railroad spur. The office and warehouse buildings are located in the northwestern corner of the property. Other smaller buildings, employee facilities and machine shops, are located in the northeastern corner of the property. The plant process units and associated tanks are located along the southern portion of the property, east of the entrance driveway and adjacent to the

active railroad spur. The spur runs primarily east-west along the southern boundary of the plant process units. A stormwater drainage ditch is located along the southern edge of the railroad spur, is concrete lined for most of its length, and serves to route stormwater flow east to the Normandie Avenue ditch area. A 30-foot petroleum pipeline right-of-way (Exxon/Mobil) is located along the very southern property boundary. The existing JCI property features are shown in **Figure 2**.

Historical property features relevant to this soil investigation are shown in **Figure 5**. The former sulfuric acid plant was located in the northeast corner of the JCI property, just southeast of the current employee locker/lunch room. The former sulfur burner was located along the northern property boundary. Based on a review of historical aerial photographs, truck traffic routes at the JCI property are additionally shown in this figure. Finally, this figure shows the location of an inactive 10-inch diameter industrial sewer pipe, which reportedly ran from the former Montrose waste pond to the East Torrance Extension Trunk.

2.2 TOPOGRAPHY

The topography at the JCI property is generally even and planar, with a surface elevation of approximately 48 to 49 feet above mean sea level (MSL) along the northern border. The surface of the property slopes to the south, towards the surface drainage ditch, to an elevation of approximately 44 to 45 feet above MSL as shown in **Table 1**. The majority of the JCI property is paved with asphalt or concrete, with the exception of a 30-foot wide right-of-way along the southern boundary that is uncovered.

2.3 GEOLOGY

The JCI and Montrose properties are located within the West Coast Basin of the Torrance Plain. The Ballona Escarpment bounds the West Coast Basin to the north, the Newport-Inglewood Uplift to the east, Palos Verdes Hills to the southwest, and the Pacific Ocean to the west. There are four major structural features in the vicinity of the JCI property within the Torrance Plain: the Charnock Fault, the Palos Verdes Fault, the Torrance Anticline, and the Gardena Syncline (EPA, 1998; and, California Department of Water Resources [CDWR], 1961).

The stratigraphy of the West Coast Basin includes Quaternary age continental and marine deposits and Tertiary age marine sediments overlying a basement complex of igneous and metamorphic rocks. The geologic units of hydrogeologic interest are (in order from oldest to youngest): the Pico Formation; the San Pedro Formation; the Lakewood Formation; and, older dune sand, alluvium, and active dune sand (EPA, 1998; CDWR, 1961).

Hydrogeologic units in the West Coast Basin include aquitards and aquifers of varying compositions and water-yielding properties. These units, in order from first water encountered to deeper units, include: the Upper Bellflower Aquitard, the Bellflower Aquifer, the Gage Aquifer, the Lynwood Aquifer, and the Silverado Aquifer. A detailed discussion of the regional

geologic, hydrogeologic, and physiographic setting is presented in the RI Report (USEPA, 1998).

2.4 SITE-SPECIFIC GEOLOGY

Shallow soils at the JCI Property are primarily composed of low permeability silts and clays with 10% to 40% sand. In a small number of borings, thin sand layers were observed and contained between 20% and 40% silt/clay. The shallow soils observed at the JCI property are consistent with the soil types observed at the adjacent Montrose Property (excluded reworked material). Shallow soils at the adjacent Montrose Property have been classified as Playa Deposits with the following description:

> Playa Deposits (PD): This layer is found near surface to depths of approximately 25 feet bgs. According to grain size analyses of soil samples collected in this layer silt and clay comprise more than 65 percent of these soils.

No groundwater was reported in any of the soil borings, although moist conditions were observed in some borings drilled along existing surface water drainage channels (e.g. average moisture content of 23.5% at boring C165). At the adjacent Montrose Property, groundwater is known to occur at 60 feet bgs. A copy of the soil boring logs is provided in **Appendix B**.

2.5 PREVIOUS JCI PROPERTY SOIL INVESTIGATIONS

Previous soil investigation activities at the JCI property are summarized in the *Final Remedial Investigation (RI) Report for the Montrose Superfund Site* (USEPA, 1998) and the *Preliminary Endangerment Assessment* for the Jones Chemical Facility (Levine-Fricke, 1995). JCI property soils have been investigated for the presence of pesticides on three separate occasions in the past. EPA established Characterization Objective No. 1 in order to delineate the lateral and vertical extent of elevated DDT and BHC concentrations previously detected at the JCI property.

In 1981, 4 soil samples were collected from two locations (*13 and *15) within the surface drainage ditch as shown in **Figure 6**. These samples were collected at the request of the Los Angeles County Department of Health Services to investigate impacts to soils from surface water drainage pathways. A surface sample was collected at *15, and at *13, soil samples were collected at 0.5, 1, and 1.5 feet. DDT was detected in all 4 samples in concentrations ranging from 1 to 30 mg/kg. Only the 30 mg/kg detected in the surface sample at *15 exceeded the present characterization benchmark.

In 1986, 5 soil borings were drilled along the northern border of the JCI property by Hargis + Associates, Inc. at the locations shown in **Figure 6** (JC001 through JC005). The borings were shallow and drilled to between 4 and 8 feet bgs. A total of 27 soil samples were collected from these 5 borings and analyzed for the presence of pesticides. Total DDT constituents were detected in 22 of the 27 samples in concentrations ranging from 0.022 mg/kg to 760 mg/kg as shown in **Figure 7**. Six of the 27 samples contained Total DDT above the present characterization benchmark as follows:

- JC002: 100 mg/kg at 1-foot bgs
- JC003: 760 mg/kg at 1.75-feet bgs
- JC003: 560 mg/kg at 2.25-feet bgs
- JC003: 170 mg/kg at 2.75-feet bgs
- JC003: 22.72 mg/kg at 5.5-feet bgs
- JC005: 590 mg/kg at 1-foot bgs

JC003 and JC005 were located north of the JCI office building and south of the Montrose Property. Total BHC constituents were detected in only 1 of the 27 soil samples, 0.063 mg/kg at 5.5-feet in JC003, as shown in **Figure 8**. However, 4 of the 26 soil samples in which no BHC isomers were detected had elevated reporting limits above at least one of the respective benchmarks. The reporting limits in these 4 samples were raised due to the presence of Total DDT in concentrations exceeding 100 mg/kg.

In 1994, 77 soil borings (LF-1 through LF-77) were drilled by Levine-Fricke, Inc. to characterize JCI property soils. A total of 71 soil samples were analyzed for the presence of pesticides from 30 of the 77 soil borings as shown in Figures 7 and 8. 28 of the 30 soil borings were shallow, with samples collected between 1 and 10-feet bgs. 2 of the 30 soil borings, LF-33 and LF-34, were drilled to between 35 and 45 feet bgs to characterize soil conditions adjacent to the former dry well. Total DDT constituents were detected in 66 of the 71 soil samples in concentrations ranging 0.0006 to 805 mg/kg as shown in Figure 7. 3 of the 66 samples contained Total DDT above the present characterization benchmark as follows:

- LF-10: 805 mg/kg at 1-foot bgs
- LF-14: 13.59 mg/kg at 3 feet bgs
- LF-34: 64.2 mg/kg at 15 feet bgs

LF-10 is located east of the warehouse building and former railroad tracks. LF-14 is located at the northern JCI property boundary, and LF-34 is located next to the former dry well. Total BHC constituents were detected in 44 of the 71 soil samples in concentrations ranging from 0.00027 to 73 mg/kg as shown in Figure 8. 2 of the 44 samples contained Total BHC constituents above the present characterization benchmarks as follows:

- LF-10: 55.6 mg/kg at 1-foot bgs
- LF-48: 73 mg/kg at 1.5 feet bgs

The BHC concentration at LF-10 is co-located with an elevated concentration of Total DDT. LF-48 is located in the southeastern corner of the JCI property and is not co-located with Total DDT above the benchmark. None of the 27 soil samples in which no BHC isomers were detected had elevated reporting limits above the respective benchmarks.

2.6 VEHICLE TRAFFIC ROADWAYS

From review of historical aerial photos, no separation of vehicular traffic between the JCI and Montrose sites is evident during a portion of the Montrose manufacturing history (from 1947 to 1982). In some aerial photos, roadways are observed to extend across the boundary between the two properties at three locations as shown in Figure 5 and summarized as follows:

Roadway No. 1: A north-south route extended from the JCI property entrance up to the Montrose property, between the Montrose trash dike and salvage area.

Roadway No. 2: An east-west route located south of the Stauffer acid plant and Montrose grinding plant, crossing the eastern Montrose rail spurs.

Roadway No. 3: A north-south route located between the Stauffer acid plant and Montrose grinding plant.

Additional roadways between the Stauffer sulfur burner and the acid plant are shown in Figure 5, but these roadways did not extend to the Montrose property. EPA established Characterization Objective No. 2 in order to investigate if pesticides were transported to the JCI property by truck traffic from the Montrose property.

2.7 SURFACE STAINING

White staining of the surface around the Montrose formulating and grinding plant, on the west and south sides, is visible in some aerial photos from the 1960s. EPA established Characterization Objective No. 3 to investigate if Montrose grinding plant operations impacted shallows soils at the JCI property.

2.8 AERIAL DISPERSION PATHWAY

EPA identified aerial dispersion as a possible pathway for pesticide migration to the JCI property. EPA established Characterization Objective No. 4 to investigate if pesticides migrated to the JCI property via aerial dispersion from former Montrose plant operations.

2.9 STORMWATER PATHWAY

EPA identified historical stormwater flow as a possible transport mechanism for pesticides, either directly from the Montrose property or for pesticides previously transported to the JCI property by aerial dispersion. Although only one of the historical surface water drainage pathways originated from the Montrose Property (southeast corner of JCI property), EPA established Characterization Objective No. 5 to investigate if pesticides migrated to or across the JCI property as a result of historical stormwater flow.

3 FIELD ACTIVITIES

Section 3.0 describes the field work performed at the JCI property to document site conditions and to collect soil samples for laboratory analyses. Soil sampling activities at the JCI property were conducted November 5 to 9, 2007 (borings C153 through C177B) and on March 13, 2008 (borings C178 through C186). All soil sampling activities were conducted in accordance with the Montrose FSP, the JCI Addendum, and the Montrose QAPP.

3.1 SOIL SAMPLING LOCATIONS

A total of 34 soil borings were drilled at the JCI property in 2007 and 2008 as shown in **Figure 9**. The locations for the 25 soil borings drilled in November 2007 were selected based on the investigation objectives as specified in the 2005 FSP Addendum (Earth Tech, 2005c) and summarized as follows:

Rationale for Soil Boring Locations

Boring ID	Characterization Objective					Notes
	No. 1	No. 2	No. 3	No. 4	No. 5	
C153	X					Delineate west of JC005
C154	X					Delineate south of JC005
C155	X					Delineate south of JC003
C156	X	X			X	Delineate south of LF14
C157	X		X			Delineate south of JC002
C158	X					Delineate north of LF10
C159	X					Delineate west of LF10
C160B	X	X			X	Delineate east of LF10
C161	X					Delineate south of LF10
C162	X	X	X			Delineate west of LF48
C163	X				X	Delineate south of LF48
C164	X				X	Delineate vertical extent at *15
C165	X				X	Delineate vertical extent at LF56
C166		X				N/S roadway near JCI entrance
C167B		X				N/S roadway near RR tracks
C168		X				E/W roadway south of transformer
C169		X	X		X	E/W roadway south of Stauffer acid plant
C170		X	X			E/W roadway south of Montrose grinding plant
C171		X				E/W roadway north of transformer
C172		X	X			E/W roadway north of Stauffer acid plant
C173				X		South of Montrose grinding plant
C174				X		South of Stauffer acid plant
C175				X	X	SW of process tanks in low lying area
C176				X		South of JCI warehouse
C177B				X		SW corner of JCI property
Total	**13**	**10**	**5**	**5**	**7**	

Borings C160B, C167B, and C177B are identified as having a "B" suffix, which was added to denote that the borings were intentionally moved from the original planned locations. Borings C160 and C167 were re-positioned in order to additionally characterize shallow soils along the inactive 10-inch diameter sewer line as requested in the September 2007 EPA conditional approval letter (EPA, 2007). Boring C160 was moved south along the stormwater pathway, and boring C167 was moved northwest within the historical truck traffic route. Additionally, boring C177 was relocated due to the presence of JCI plant fire water lines.

The locations for the 9 soil borings drilled in March 2008 were selected to delineate the lateral and vertical extent of pesticides detected in the 2007 soil borings. A summary of the rationale for each boring location is provided below:

- C178: Delineate east of C155 and north of C158/C159
- C179: Delineate south of C154
- C180: Delineate east of C158
- C181: Delineate vertical extent at C172
- C182: Delineate NE of C167B
- C183: Delineate north of C177B
- C184: Delineate SW of C167B
- C185: Delineate south of C162
- C186: Delineate east of C177B

Some of the 9 borings drilled in 2008 additionally served to address other characterization objectives. Borings C182 and C184 were positioned along the inactive 10-inch diameter sewer line. Boring C180 was positioned along a historical stormwater pathway. Borings C180, C181, C182, and C184 were also positioned along historical truck routes.

3.2 SOIL SAMPLING DEPTHS

Borings C153 through C177B were drilled to 10 feet bgs, with soil samples collected at 1, 3, 5, 7, and 10 feet bgs. Borings C178-C180 and C182-C186 were drilled to 3 feet bgs, with soil samples collected at 1 and 3 feet bgs. Boring C181 was drilled to 20 feet bgs, with soil samples collected at 15 and 20 feet bgs. A summary of the soil samples collected at the JCI property in 2007 and 2008 is provided in **Table 2**.

3.3 UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

Prior to the 2007 and 2008 soil sampling activities, Underground Service Alert of Southern California (Dig Alert) was notified of the drilling activities intended at the JCI property. For the November 2007 investigation, Dig Alert provided confirmation ticket number, A73040693. For the March 2008 investigation, Dig Alert provided confirmation ticket number, A81371257.

3.4 SURVEYING OF SOIL BORING LOCATIONS

A certified land surveyor, WM Surveys, Inc. identified the soil boring locations based on a geo-referenced aerial image. Soil sampling locations were surveyed to the nearest 0.05-foot. Survey results include the easting (X) and northing (Y) coordinates in Universal Transverse Mercator (UTM), Zone 11, North American Datum (NAD) 1983 coordinate system and the ground surface elevation.

WM Surveys, Inc. surveyed the initial locations of the 25 soil borings on October 9, 2007, prior to drilling. Some of the soil borings were moved or relocated during the investigation, and the final locations of the soil borings were resurveyed on December 19, 2007. The 2008 soil boring locations were surveyed on March 26, 2008, following drilling. The final survey coordinates and elevations for all soil borings are summarized in **Table 1**.

3.5 GEOPHYSICAL CLEARANCES AND SURFACE PAVEMENT CORING

Prior to drilling, each borehole location was geophysically cleared by Spectrum Geophysics on October 17, 2007. No additional geophysical clearance was needed for the step-out boring locations drilled in 2008. For both the 2007 and 2008 sampling events, Concrete Coring Company cored 4-inch diameter holes through the surface cover at all paved sampling locations.

3.6 SAMPLE COLLECTION – DIRECT PUSH AND HAND AUGER DRILLING AND SAMPLING

From November 5 to 9, 2007, Gregg Drilling & Testing, Inc., drilled and sampled soil from 25 soil borings at the JCI plant property at locations shown in Figure 9. On March 13, 2008, 9 additional soil borings were drilled at the JCI property by Gregg Drilling. Two sampling techniques, direct-push and hand auger, were used to collect the soil samples for analyses during this investigation. The following sections describe the work performed using direct-push and hand-auger drilling and soil sampling techniques.

3.6.1 Direct Push Soil Sampling at JCI Property (Borings C153-C162, C166-C176, and C178-C186)

The soil borings were drilled at the JCI property in accordance with the schedule shown as **Table 2**. The drilling schedule was established in advance of each sampling event and was designed to accommodate the available capacity/throughput of the analytical laboratory. On average, 6 to 7 soil borings were drilled per day resulting in 6 days of sampling, excluding collection of IDW samples. The sampling schedule shown has been revised to show the final, completed sampling dates for the various soil borings.

A direct push drill rig was used to sample soil at target depths between 1 and 20 feet bgs. Soil was collected using an 18-inch long sampler containing three 6-inch long and 1-inch diameter stainless steel sleeves. The sampler was driven from 6 inches above the target depth to 12 inches below the target depth, such that the upper and middle sleeves bracketed the target depth (e.g., 2.5 to 3.5 feet bgs for a target depth of 3.0 feet bgs). Soil contained in the upper and middle

sleeves were submitted for laboratory analysis. A small portion of the soil contained in the middle sleeve was also used to evaluate sample headspace. Soil contained in the bottom sleeve was not submitted for laboratory analysis but was logged for lithology.

At the completion of each soil boring, the sampling tools and any direct push rods were removed from the soil boring. The resulting soil boring was filled with hydrated bentonite clay chips to grade or near grade. A soil boring that first required coring through pavement was filled to a level corresponding to the bottom of the paving material. The core hole was filled with concrete dyed to match the existing pavement. If a soil boring was drilled through surface soil with no paving, then it was filled with hydrated bentonite chips to within an inch or two of surface grade. Native soil was then placed in the soil boring and filled to final grade.

3.6.2 Hand Auger Soil Sampling at JCI Property (Borings C163, C164, C165 and C177B)

For health and safety reasons due to the proximity of railroad cars containing caustic material, soil borings C164 and C165 were drilled and sampled using hand auger drilling equipment on November 7, 2007. Similarly, soil boring C177B was drilled using a hand auger on November 8, 2007 due to the proximity of an underground water service pipeline. Soil boring C163 was drilled using a hand auger on November 9, 2007 due to physical obstructions that prevented access for the direct push rig to this sampling location.

At these four borings, soil from the hand auger at the target depth (6 inches above to 6 inches below the target depth) was emptied in a stainless steel bowl and field homogenized before collecting the soil sample in glass jars. The stainless steel bowl was decontaminated between uses in accordance with the procedures identified in Section 3.10. The soil samples in glass jars were handled as described in Section 3.9.2.

Soil borings C163 and C177B were backfilled and resurfaced in the same manner as described above in Section 3.6.1. Soil borings C164 and C165, located along the railroad tracks, were filled with bentonite clay chips to within an inch or two of surface grade. Native soil was then placed in the soil boring and filled to grade.

3.7 SOIL BORING LOGGING

Earth Tech identified sampled soils using the Unified Soil Classification system (USCS) described in American Society of Testing and Materials (ASTM) Standard Practice for Description and Identification of Soils - Visual-Manual Procedure Designation D 2488-93 (ASTM, 1993). Soil sample descriptions were documented on lithologic logs for each soil boring drilled. Copies of the final soil boring logs are provided in **Appendix B.**

3.8 FID AND PID SAMPLE SCREENING

Earth Tech used a flame ionization detector (FID) and a photo-ionization detector (PID) to measure concentrations of organic vapors present in the headspace of collected soil samples.

The FID was a Thermo Environmental TVA Model 1000. The PID was a MiniRAE Model 2000.

The FID and PID were calibrated daily in the morning prior to the start of work. The calibration regime consisted of following the manufacturer's guidance to zero the instruments followed by calibration with known volatile gases at specific concentrations. The FID was calibrated with hexane gas at a concentration of 100 parts per million (ppm). The PID was calibrated with isobutylene gas at a concentration of 100 ppm.

Soil samples were field screened for organic vapors using both the FID and PID. For field screening, a soil sample from each sample interval was placed and sealed in a re-sealable plastic bag. The sealed sample was manipulated by hand as needed to disaggregate the sample. After sample disaggregation, the sealed sample was allowed to volatilize in the bag for approximately 5 to 10 minutes. At the end of this time, the bag was pierced with a metal tool and the intake probe on the FID/PID was inserted into the bag**.** The concentration of organic vapors present in the headspace of the bag was measured with both instruments and the values recorded on the soil boring logs. Refer to the soil boring logs in **Appendix B** for the headspace sample measurement results.

3.9 SAMPLE NUMBERING, HANDLING, PREPARATION, PACKING, TRANSPORT, CHAIN-OF-CUSTODY

This section describes the sample management that occurred during the soil investigations at the JCI property. The tasks described are also outlined in the Montrose FSP (Earth Tech, 2005a).

3.9.1 Sample Numbering

The sample numbering corresponds to soil boring locations shown in **Figure 9**. Duplicate samples were collected at a frequency of 10% of the primary samples. Duplicate samples were numbered similarly to the primary samples with one addition. The duplicate was distinguished by adding a value of 100 to the boring depth from the additional sample collected from the unique sample. An example of duplicate numbering is given below and is summarized in **Table 2**:

- Sample C156-5 – Primary sample from soil boring C156 at a depth from 4.5 to 5.5 feet bgs; and
- Sample C156-105 – Duplicate sample from soil boring C156 at a depth of 4.5 to 5.5 feet bgs.

MS/MSD samples were collected at a frequency of 1 for every 20 primary samples. MS/MSD samples were numbered using the standard sampling system as shown in **Table 2**. The designation MS/MSD was added to the chain-of-custody (COC) form for the MS/MSD samples.

An equipment blank sample was collected daily for every field soil sampling day. This sample was an aqueous sample of laboratory supplied Type II reagent-grade water to rinse off the decontaminated soil sampler. The equipment blank sample designation comprised the abbreviation "EB" and the calendar date (for example, EB110507). The EB samples were collected in two 1-liter amber glass bottles.

3.9.2 Sample Handling and Preparation

Stainless Steel Sleeves: Soil was collected using an 18-inch long sampler containing three 6-inch long and 1-inch diameter stainless steel sleeves. Except for a small portion of the middle sleeve, which was retained for headspace analysis, soil contained in the upper and middle sleeves were submitted for laboratory analysis. The sleeves were sealed properly on both ends with Teflon™ tape and caps, labeled, and custody seals were placed across the end caps. The sleeves were placed in a re-sealable plastic bag and immediately placed in a cooler with ice for transport to the analytical laboratory. The process for packing and transport of samples is described in Section 3.9.3. The laboratory was instructed to homogenize the sample prior to analysis. Soil contained in the bottom sleeve was not submitted for laboratory analysis but was logged for lithology.

Glass Jars: Duplicate, split, and MS/MSD samples were collected in glass jars and handled in the same manner. The soil from both the upper and middle sleeves were emptied into a stainless steel bowl and homogenized in the field. The homogenized soil was then placed into two glass jars containing equal portions of soil, with one jar identified as the primary sample and the second jar identified as either the duplicate, split, or MS/MSD sample, as appropriate. Soil samples collected using hand auger methods were also field homogenized in a stainless steel bowl and placed in glass jars. The stainless steel bowl was decontaminated between uses in accordance with the procedures identified in Section 3.10. The samples in the jars were sealed, labeled, and custody seals were placed across the jar lids. Each glass jar was placed in a re-sealable plastic bag and immediately placed in a cooler with ice for transport to the analytical laboratory. The laboratory was instructed to homogenize the sample prior to analysis.

3.9.3 Sample Packing and Transport

A multi-step process was used to pack the soil samples (i.e., sleeves, jars) for shipment. Two double-bagged plastic bags were first placed into a portable cooler used for sample shipment. Void space in the cooler between the samples was filled with double-bagged plastic bags of water ice and plastic bubble wrap. Four to five additional bags of double-bagged water ice were placed on top of the containers. When the cooler was full, the interior plastic bags were tie-wrapped shut. The COC form, when completed, was placed inside a self-sealing plastic bag. The bag was taped to the inside of the top cooler lid. The cooler lid was sealed with two courses of strapping tape around the entire cooler. The drain plug in the side of the cooler was sealed with tape on the inside and outside of the cooler. An initialed and dated custody seal was placed across the lid and body of the cooler. Packed sample coolers were delivered daily to a local Federal Express shipping office for overnight delivery to TestAmerica Laboratories, Inc.

(TestAmerica), a California-certified analytical laboratory formerly known as Severn Trent Laboratories, Inc. (STL) in West Sacramento, California.

3.9.4 Chain-of-Custody

COC forms were completed at the time of sampling and cross-checked against the contents of each cooler prior to shipment. Samples were transported under standard COC procedures. COCs are included with the laboratory reports in **Appendix C**.

3.10 DECONTAMINATION PROCEDURES

Prior to soil drilling activities, drilling equipment such as direct-push rods and hand augers were steam cleaned and allowed to air dry. Sampling equipment that contacted samples were decontaminated in a designated decontamination area. 5-Gallon polyethylene buckets and 1-liter labeled plastic spray bottles were used to decontaminate the field sampling equipment. A small pop-up decontamination pool was used as a secondary containment basin to "catch" rinse water. Cleaned equipment was drained on top of an aluminum grate placed over the basin. Sampling equipment generally was decontaminated using the following procedure before its initial use and after use at each soil sampling location:

- Scrub and wash with a solution of potable water and Alconox (non-phosphate detergent);
- Double rinse with potable tap water;
- Rinse with trace element grade 0.1N Nitric Acid Solution (10% in deionized water);
- Rinse with high-performance liquid chromatography (HPLC), organic free water;
- Rinse with pesticide-grade methanol (pesticide-free) solvent;
- Rinse with HPLC, organic free water; and
- Air-dry equipment on a clean aluminum grate surface.

Cleaned equipment was stored in a clean area, and potentially contaminated equipment was restricted to the decontamination area. Rinse water and decontamination fluids were transferred from the basin and buckets to labeled 55-gallon drums for subsequent sealing and temporary storage pending characterization for off-site disposal.

An area was set up adjacent to the decontamination area to decontaminate personal protective equipment (PPE) and to collect spent PPE such as Tyvek® protective suits, nitrile gloves, and other PPE. Trash bags were used to collect used Tyvek® suits, gloves, emptied sample liners, and other PPE. PPE and other collected solid wastes were placed in 55-gallon drums for subsequent sealing and temporary storage pending characterization for off-site disposal.

4 LABORATORY ANALYSIS AND RESULTS

All soil samples were analyzed for pesticides by EPA Method 8081A. Analytical services were provided by TestAmerica Inc., a California-certified laboratory located in West Sacramento, California. The final laboratory reports and raw data packages are provided on compact disk (CD) in **Appendix C**. Tables of the final validated laboratory data are provided in **Appendix D**.

4.1 ANALYTICAL METHODS

The soil samples collected from the JCI property were shipped to TestAmerica in West Sacramento, California for analyses. In all cases, the laboratory received the samples within 24 hours of shipment. Soil samples were analyzed by TestAmerica for pesticides by EPA Method 8081A, and the laboratory analytical reports and associated chains-of-custody are provided in **Appendix C**.

Dry Weight Correction for Pesticides

At the request of EPA, all pesticide results were reported on a dry weight basis. Concentrations on a wet weight basis are corrected to dry weight based on the moisture content of the sample. Accordingly, all soil samples were additionally analyzed for moisture content by ASTM Test Method D2216-90. The dry weight concentrations are slightly higher than the wet weight concentrations, as the moisture content of the samples was typically between 3% and 29%. For this investigation, only concentrations on a dry weight basis were presented and discussed. No wet weight concentrations are presented in this investigation report. Moisture content laboratory results are provided in **Appendices C and D**.

4.2 LABORATORY RESULTS

Pesticides were detected at varying concentrations and frequencies in the soil samples collected from the JCI property as shown in **Table 3**. Pesticides detected in the soil samples from the JCI property in at least one sample are summarized below by frequency of detection and in descending numerical order (i.e., from highest to lowest frequency of detection):

- 4,4'-DDT (90% frequency of detection)
- 4,4'-DDE (80% frequency of detection)
- 4,4'-DDD (79% frequency of detection)
- 2,4'-DDT (71% frequency of detection)
- 2,4'-DDD (41% frequency of detection)
- beta-BHC (38% frequency of detection)
- 2,4'-DDE (27% frequency of detection)
- alpha-BHC (27% frequency of detection)
- gamma-BHC (27% frequency of detection)
- delta-BHC (16% frequency of detection)
- gamma-Chlordane (2% frequency of detection)

- Endosulfan Sulfate (1% frequency of detection)
- alpha-Chlordane (<1% frequency of detection)
- Heptachlor (<1% frequency of detection)

There were 10 pesticide constituents that were not detected in any soil samples as shown in Table 3. The detected chemical concentrations were compared against the characterization benchmarks for soil as specified in Section 3.0 of the FSP including 10 mg/kg for Total DDT and EPA Region 9 Preliminary Remediation Goals (PRGs; USEPA, 2004b) for all other pesticide constituents. The pesticides that were found to exceed the characterization benchmarks in at least one soil sample are summarized as follows:

- Total DDT
- alpha-BHC
- beta-BHC
- gamma-BHC

The chlordane isomers, endosulfan sulfate, and heptachlor concentrations did not exceed the characterization benchmarks in any soil samples. Additionally, there is no EPA PRG or characterization benchmark for delta-BHC. Total DDT and BHC isomer concentrations in soil at the JCI Property are presented in **Tables 4 through 7** and **Figures 10 through 13**. In these tables, soil samples with concentrations exceeding their respective benchmark are highlighted in yellow.

4.2.1 Total DDT

At least one DDT, DDE, or DDD isomer was detected in 131 of the 143 soil samples analyzed by EPA Method 8081A, equal to a 92% frequency of detection. Total DDT concentrations detected in these samples ranged from 0.0003 to 36,620 mg/kg. Of the 143 total soil samples analyzed, 21 samples (15% of the total samples) were found to have Total DDT concentrations exceeding the characterization benchmark as shown in **Table 4**. As shown in this table, Total DDT concentrations exceeding the characterization benchmark were primarily found in soil samples collected at 1-foot bgs (39% of the samples). At depths below 1-foot bgs, less than 10% of the samples were found to contain Total DDT concentrations exceeding the benchmark. A summary of the soil samples exceeding the Total DDT benchmark by depth is provided below:

Total DDT
Frequency of Samples Exceeding Characterization Benchmark by Depth

Sample Depth (feet bgs)	Total No. of Soil Samples	No. Samples Exceeding Benchmark	Percentage of Samples Exceeding Benchmark	Maximum Detected Total DDT Concentration (mg/kg)
1	33	13	39%	36,620.0
3	33	2	6%	13,350.0
5	25	2	8%	689.3
7	25	2	8%	201.9
10	25	1	4%	15.6
15	1	0	0%	0.9
20	1	1	100%	16.1

Total DDT concentrations at 1-foot bgs are mapped in **Figure 10**. The highest Total DDT impacts to soils are observed in the northwestern portion of the JCI Property at C153, C155, C159, and C178 (2,574 to 36,620 mg/kg). These borings are located north of the office building and east of the warehouse building, along the former railroad tracks.

Total DDT concentrations at 3-feet bgs are mapped in **Figure 11**. With the exception of borings C159, C178, and LF-14, soil samples at 3-feet bgs were not impacted with Total DDT in concentrations exceeding the benchmark.

The maximum Total DDT concentration detected at any depth is mapped in **Figure 12**. The only additional impacts to soil shown in this figure, other than what is shown in Figures 10 and 11, are at borings C172/181 and LF-34. Total DDT concentrations of 689 mg/kg at 5 feet bgs and 64 mg/kg at 15 feet bgs were detected at these locations. LF-34 is located next to the former dry well, and C172/181 is located next to a former surface water drainage pathway.

The contribution of DDT, DDE, and DDD isomers to the Total DDT concentration is presented in **Table 5**. For the 21 soil samples found to contain Total DDT exceeding the benchmark, DDT isomers composed 73% of the Total DDT concentration on average. A summary of isomer contributions is provided below:

DDT, DDE, and DDD Isomer Contribution to Total DDT Concentrations

Constituent	Minimum	Maximum	Average
DDT, 2,4’ and 4,4’	14.7%	94.1%	73.2%
DDE, 2,4’ and 4,4’	1.1%	73.9%	16.7%
DDD, 2,4’ and 4,4’	2.4%	35.2%	10.1%

4.2.2 BHC

At least one BHC isomer was detected in 67 of the 143 soil samples analyzed by EPA Method 8081A, equal to a 47% frequency of detection. Total BHC concentrations detected in these samples ranged from 0.001 to 50.5 mg/kg. Of the 143 total soil samples analyzed, 10 samples (7% of the total samples) were found to have BHC isomer concentrations exceeding their respective characterization benchmark as shown in **Table 6**. As shown in this table, BHC concentrations exceeding the characterization benchmark were primarily found in soil samples collected at 1-foot bgs (21% of the samples). At depths below 1-foot bgs, less than 6% of the samples were found to contain BHC concentrations exceeding the benchmark. A summary of the soil samples exceeding the BHC isomer benchmarks by depth is provided below:

Total BHC
Frequency of Samples Exceeding Characterization Benchmark by Depth

Sample Depth (feet bgs)	Total No. of Soil Samples	No. Samples Exceeding Benchmark	Percentage of Samples Exceeding Benchmark	Maximum Detected Total BHC Concentration (mg/kg)
1	33	7	21%	50.5
3	33	2	6%	29.4
5	25	1	4%	2.8
7	25	0	0%	0.3
10	25	0	0%	0.05
15	1	0	0%	0.02
20	1	0	0%	0.2

The maximum Total BHC concentration detected at any depth is mapped in **Figure 13**. The highest concentrations of Total BHC occur at the southeastern corner of the JCI Property at borings C162 and LF-48 (51 and 73 mg/kg respectively). BHC isomer concentrations exceeding the characterization benchmarks additionally occur in the northwest corner of the JCI Property and adjacent to the office and warehouse buildings, co-located with the occurrence of elevated Total DDT concentrations. Eight of the 10 soil samples exceeding the BHC isomer benchmarks were co-located with exceedances of the Total DDT benchmark. Only boring C163 in the southeast corner of the JCI Property, south of LF-48, had soil samples exceeding the BHC isomer benchmarks that were not co-located with Total DDT benchmark exceedances.

The contribution of BHC isomers to the Total BHC concentration is presented in **Table 7**. For the 10 soil samples found to contain BHC isomers exceeding their respective benchmarks, beta-BHC composed 47% of the Total BHC concentration on average. A summary of isomer contributions is provided below:

BHC Isomer Contribution to Total BHC Concentrations

Constituent	Minimum	Maximum	Average
alpha-BHC	0.0%	100%	25.3%
beta-BHC	0.0%	100%	47.4%
delta-BHC	0.0%	100%	14.5%
gamma-BHC	0.0%	47.5%	12.8%

The 3-foot sample at boring C159, located adjacent to the warehouse building, exhibited a delta-BHC concentration of 28 mg/kg. Although the other three isomers for which there are benchmarks were not detected in this sample, the reporting limit was elevated (100 mg/kg) due to matrix interference from the elevated DDT concentration detected in this sample (1,705 mg/kg). For this reason, this sample was included among the 10 samples identified as having BHC concentrations exceeding the characterization benchmarks.

Similarly, there are 15 soil samples where no BHC isomers were detected but the reporting limits were elevated and exceeded at least one of the isomer benchmarks, including C155-1, C159-1, and C178-1 (3,498 to 36,620 mg/kg Total DDT). Ten of the 15 soil samples with elevated BHC reporting limits (but no BHC detections) were co-located with Total DDT concentrations exceeding the characterization benchmark of 10 mg/kg. Matrix interferences from the elevated Total DDT concentrations resulted in elevated reporting limits for the BHC isomers in these samples.

4.3 LABORATORY RESULTS BY OBJECTIVE

As identified in Section 1.1, the JCI property soil investigation consisted of 5 characterization objectives. The results associated with each objective are discussed in this section.

4.3.1 Delineate Elevated Historical Pesticide Detections

Total DDT and BHC isomer concentrations exceeding the characterization benchmarks were previously detected at 7 historical boring locations as summarized in Section 2.5: JC002, JC003, JC005, LF-10, LF-14, LF-48, and *15. The soil samples collected in 2007 and 2008 effectively delineated the lateral and vertical extent of pesticides surrounding these historical soil boring locations as follows:

JC003, JC005, LF-10, LF-14: These four historical borings were located in the northwest corner of the JCI property, where 11 new soil borings were drilled in 2007 and 2008. Elevated concentrations of Total DDT between 434 and 36,620 mg/kg were detected in this portion of the JCI property at borings C153, C154, C155, C158, C159, and C178. Total DDT impacts in this area extend to the northern and western JCI property boundaries. The eastern and southern extents of Total DDT impacts in this area were defined by samples collected at C156, C160B, C161, and C180, where concentrations between 0.2 and 5.8 mg/kg were reported. Although a

Total DDT concentration of 24 mg/kg was detected at C179 (south of C154), the extent of Total DDT impacts in this area is defined by LF-11 where only 2.9 mg/kg were detected in 1994.

The lateral extent of Total DDT impacts to soil in the northwest corner of the JCI Property has been delineated to the property boundaries. Total DDT impacts to soil at the Montrose Property to the north have been delineated by separate investigation activities. Additional delineation to the west at the Frito-Lay Property is not practical since that property has been significantly redeveloped in recent years, including over-excavation and re-grading to a height that is approximately 3 feet higher than the JCI Property (i.e., original soil surface is not present). Additional delineation to the west at the LADWP electrical substation is not practical due to safety concerns. Although some uncertainty still exists regarding the extent of Total DDT impacts to soil, the available data are sufficient for purposes of feasibility studies.

JC002: Boring C157 was drilled south of JC002 to delineate the lateral extent of Total DDT impacts to soil detected in 1986 (100 mg/kg). No DDT, DDE, or DDD were detected in samples collected at C157, thereby effectively characterizing the extents of Total DDT south of JC002.

LF-48: Borings C162, C163, and C185 were drilled north, south, and west of historical boring LF-48 to delineate the lateral extent of BHC impacts to soils detected in 1994 (73 mg/kg). BHC isomer concentrations exceeding their respective benchmarks were detected both north and south of LF-48 (at C162 and C163). Therefore, the northern and eastern extents of BHC impacts to soils at this location are the JCI property boundaries, while the southern extent is the existing railroad tracks. To the west, the extent of BHC impacts was determined by soil samples collected at C185, where a maximum Total BHC concentration of 0.3 mg/kg was detected.

*15: Boring C164 was drilled adjacent to historical boring *15 to delineate the vertical extent of Total DDT detected in a surface sample in 1981 (30 mg/kg). None of the soil samples collected at C164 exceeded the characterization benchmark (maximum of 0.3 mg/kg), and therefore, the vertical extent of Total DDT impacts at this location is less than 1 foot.

LF-55: A Total DDT concentration of 9.1 mg/kg was detected in the 3-foot sample at boring LF55 in 1994. Although this concentration is slightly below the characterization benchmark, boring C165 was drilled to delineate the vertical extent of Total DDT impacts at this location. Although 11.25 mg/kg of Total DDT was detected in the 1-foot sample at C165, all deeper samples had Total DDT concentrations below the benchmark. Therefore, the vertical extent of DDT impacts at this location was effectively delineated between 1 and 3 feet bgs.

4.3.2 Vehicle Traffic Roadways

A total of 14 soil borings were drilled in 2007 and 2008 along historical truck routes at the JCI property, two of which were at the same location (C172/181). Total DDT concentrations exceeding the characterization benchmark, 13 to 689 mg/kg, were detected at 6 of the 14 soil borings including C162, C166, C167B, C170, and C172/181. 5 of the 6 borings also serve to

address other characterization objectives, and therefore, only the 13 mg/kg Total DDT concentration detected in the 1-foot bgs sample at boring C166 is exclusive to the historical truck route objective. The maximum Total DDT concentration detected at the remaining 8 soil borings located along former truck traffic routes ranged from <0.1 to 7 mg/kg.

4.3.3 Surface Staining

A total of 6 soil borings were drilled in 2007 and 2008 along the JCI property boundary bordering the former Montrose grinding plant, where surface staining was observed in historical aerial photos. Total DDT concentrations exceeding the benchmark were detected in 4 of the 6 borings including C162, C170, and C172/181. None of the soil samples from borings C157 and C169 contained Total DDT in excess of the characterization benchmark.

At borings C162 and C170, Total DDT was detected at 620 and 14 mg/kg respectively in the 1-foot bgs samples. None of the deeper samples from these two borings contained Total DDT in excess of the benchmark.

At borings C172/181, only deeper soil samples at 5, 7, 10, and 20 feet bgs were impacted with Total DDT in excess of the benchmark. Although the 1 and 3-foot samples at boring C172 contained only 3.4 and 9.3 mg/kg Total DDT respectively, the 5, 7, and 10-foot samples contained 689, 202, and 16 mg/kg Total DDT respectively. At boring C181, located adjacent to boring C172, the 15 and 20-foot samples contained 0.9 and 16 mg/kg Total DDT respectively. DDT is a solid at site conditions and is relatively immobile in subsurface soils unless in the presence of a solubilizing agent, such as a chlorinated volatile organic compound (VOC). The occurrence of Total DDT at greater depths in these borings may reflect co-occurrence with a chlorinated VOC, and it is noted that tetrachloroethylene (PCE) was previously detected in soils at this location, up to 520 mg/kg at 10 feet bgs in boring LF-36. JCI has proposed additional characterization of soils in this area for VOCs, i.e., proposed borings J-SB-84 and J-SB-85 (Levine-Fricke, 2008). Although some uncertainty still exists regarding the vertical extent of Total DDT impacts to soil at this location, the available data are sufficient for purposes of feasibility studies.

4.3.4 Aerial Dispersion Pathway

A total of 8 soil borings were drilled in 2007 and 2008 along the southern portion of the JCI property to investigate if aerial dispersion from former Montrose plant operations have impacted JCI property soils. None of the samples from 7 of the 8 soil borings were found to exceed the Total DDT characterization benchmark including: C173, C174, C175, C176, C183, C185, and C186. Only the 1-foot sample at boring C177B was found to have a Total DDT concentration (1,283 mg/kg) exceeding the benchmark. The Total DDT concentrations in the remaining 4 samples collected at C177B (3, 5, 7, and 10 feet) were all below the characterization benchmark.

Delineation of Total DDT to the west and south of boring C177B, within the JCI Property, was obstructed by the presence of underground water and petroleum pipelines. However, southwest and southeast of boring C177B, Total DDT in soil was previously delineated in 2005 by borings C66 and C67 located along the northern boundary of the LADWP right-of-way as shown in Figures 10 through 13. Maximum Total DDT concentrations of 0.8 and 0.4 mg/kg were detected at borings C66 and C67 respectively in 2005 as shown in Figure 12.

4.3.5 Stormwater Pathway

A total of 8 soil borings were drilled in 2007 and 2008 along historical stormwater pathways at the JCI property. None of the soil samples from 7 of the 8 borings were found to contain Total DDT in concentrations exceeding the benchmark including: C156, C160B, C163, C164, C169, C175, and C180. Only the 1-foot sample collected at C165 was found to have a Total DDT concentration (11 mg/kg) exceeding the benchmark. The Total DDT concentrations in the remaining 4 samples collected at C165 (3, 5, 7, and 10 feet) were all below the characterization benchmark.

4.3.6 Inactive Sewer Line

A total of 4 soil borings were drilled in 2007 and 2008 along the inactive 10-inch diameter sewer line at the JCI property. None of the soil samples from 3 of the 4 borings were found to contain Total DDT in concentrations exceeding the benchmark including: C160B, C182, and C184. Only the 1-foot sample collected at C167B was found to have a Total DDT concentration (240 mg/kg) exceeding the benchmark. The Total DDT concentrations in the remaining 4 samples collected at C167B (3, 5, 7, and 10 feet) were all below the characterization benchmark.

5 DATA REVIEW AND VALIDATION

This data quality assessment section discusses the quality and usability of the definitive-level analytical data for the soil samples collected during sampling conducted from November 5 to 9, 2007 and March 13, 2008.

All of the soil samples and associated equipment blanks were analyzed for pesticides (SW846 8081A) and the soil samples were analyzed for soil moisture content (D2216) so results could be reported on a dry-weight basis. The analyses were performed by TestAmerica formerly known as STL, of West Sacramento, California, according to the requirements of *SW846 Test Methods for Evaluating Solid Waste Physical/Chemical Methods* (USEPA, 1996) and the Montrose QAPP (Earth Tech, 2005b).

In addition, one soil sample and one water sample were collected and analyzed for the characterization of IDW by TestAmerica, which is a California Certified Laboratory. These data were used for characterization and disposal of the IDW according to the applicable regulations. Although waste characterization data are not required to undergo data validation, the results for the IDW samples are included in this data quality assessment.

The analytical data were provided in U.S. EPA Level IV format. Level IV data packages included the case narratives, completed COC documentation, laboratory analysis results reporting forms, QC summary forms, and the raw data generated from each analytical method performed, such as sample preparation sheets, instrument run logs, calibration data, chromatograms, calculation sheets, and instrument generated quantitation reports.

Level III validation was performed on 100% of the environmental samples collected for this data set, with Level IV review performed on approximately 10 percent of the analytical data, as specified in the QAPP. The analytical data consisted of 11 sample delivery group (SDGs), which were analyzed by TestAmerica. The samples, matrices, and analytical parameters for which the data were analyzed and the level at which they were validated are identified in **Table 9**.

The laboratory data for the definitive level samples were reviewed for conformance to the requirements of the SW846 methods, the QAPP, and the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 1999) (the Functional Guidelines) as applicable to SW-846 method 8081A. The reviewer's professional judgment was used to evaluate data quality when called for in the Functional Guidelines. The data validation process was performed by Earth Tech chemists in Long Beach and San Jose, California.

Data validation is a systematic process of reviewing and qualifying the analytical data presented against an established set of criteria. Validation is performed to ensure the quality of collected data and to assess limitations on usability, as well as to evaluate laboratory compliance with specified methods and protocols. The following documentation and criteria were evaluated.

Organic Analyses

- Case Narrative
- Data Summary Sheets
- Sample Custody
- Holding Times
- Initial and Continuing Calibrations
- Method Blanks
- Laboratory Control Sample (LCS) and LCS duplicate (LCSD) Recoveries and Relative Percent Differences (RPDs)
- MS/MSD Recoveries and RPDs
- Surrogate Recoveries for System Monitoring Compounds
- Target Compound Identification and Quantitation (Level IV only)
- MDL and RL
- Instrument Run Logs
- Sample Chromatograms (Level IV only)
- Sample Preparation Sheets
- Field Duplicates

Data validation qualifiers were assigned by the data validator to all definitive-level data that failed to meet specified analytical and QC criteria according to requirements specified in Table 5 (Method SW8081A) of the QAPP and the Functional Guidelines. Instances where specified criteria were not met are discussed in the respective Quality Assurance Summary Reports (QASR) included as **Appendix G**.

No data were qualified as "R" as rejected and considered unusable. Data qualified with the "J" or “UJ” qualifiers are considered estimated and usable within the constraints of the final data usability assessment. Data qualified with the "U" qualifier are considered non-detected at the reported value, and are usable to demonstrate the analyte is not present above the reported concentration. The qualifiers used to flag validated and verified analytical data are summarized below. The validation qualifiers are:

J	The analyte was reported as detected by the laboratory, the result is an estimate due to QC parameter exceeding specified control limits.
UJ	The analyte was reported as ND by the laboratory, the result is an estimate due to QC parameter exceeding specified control limits.
U (detected, but blank-qualified)	The analyte was tested for and detected above the MDL, but is considered non-detected (ND) at the reported value due to detection in an associated blank at a level greater than one-fifth the reported concentration in the sample.
R (unusable)	The result is rejected due to QC failure or data quality limitations. The presence or absence of the analyte in the sample cannot be verified, or the reported result is so severely compromised as to be unusable.

All results for all analytical runs for each sample were validated and qualifiers applied, as specified in the QASRs (**Appendix G)**. Note that for each sample, one analytical result was determined to be most appropriate for reporting purposes for each analyte by the laboratory according to dilution and QA/QC results. These results have been used for reporting purposes and are provided in the sample results tables in **Appendix D**.

A technical completeness of 100 percent for the data was achieved for this project. None of the data were qualified as rejected (R), 0.15 percent of the data were blank-qualified as non-detected (U), and 5.6 percent were qualified as estimated (J/UJ) in data validation for exceeding quality assurance objectives (QAOs) specified for precision, accuracy, representativeness, comparability, and completeness (PARCC) in the QAPP. Note that the only data for EPA Method SW8081A have been used for calculating percent compliance for PARCC objectives, data for moisture content by Method D2216 are not included in these calculations. All data validation qualifiers were reviewed with respect to usability for project objectives. All of the estimated and blank-qualified data were determined to be usable and to meet project objectives. Data quality, data usability, completeness, and PARCC assessment for each method is summarized in the following sections.

5.1 DATA QUALITY ASSESSMENT FOR PESTICIDES—SW8081A

A total of 143 soil samples, 15 field duplicate samples, 1 IDW soil sample, 1 IDW water sample, and 6 equipment blanks (EBs) were analyzed by EPA Method SW8081A for pesticides. In data validation, for the data determined to be used for reporting purposes, no sample results were qualified as rejected (R), six sample results (0.15 percent of the data) were blank-qualified as non-detected (U), and 5.6 percent of the data were qualified as estimated (J/UJ), mostly related to calibration verifications exceeding 15 percent difference (%D).

5.1.1 Data Usability Assessment of Qualified Data for EPA Method SW8081A—Pesticides

For samples with results reported from more than one analytical run, the analytical result most appropriate for reporting purposes for each analyte was reported by the laboratory. No results exceeding the calibration range for method SW8081A were reported by the laboratory.

All results reported as detected at less than the RL but greater than the MDL were reported by the laboratory with the "J" laboratory qualifier (approximately 10.9 percent of the SW8081A data). Note that RLs and MDLs are adjusted for dilutions, and the laboratory "J" qualifier applied as appropriate. This qualifier appears in the "Results" column of the results tables. Such results may be quantitatively and qualitatively uncertain due to uncertainty near the limits of detection. No validation qualifiers were assigned as these results are not representative of QA/QC problems.

Twenty-eight detected results were reported by the laboratory with the laboratory qualifier "PG", meaning these results had a greater than 40% D between the primary and confirmation analyses (approximately 0.7 percent of the SW8081A data). These qualifiers appear in the "Results" column of the results tables. No additional validation qualifiers were applied in data validation. Of the 28 affected results, 26 were reported as detected below the RL and the remaining 2 results were reported as detected marginally above the RL. Note that for results at such low concentrations, small differences in concentrations between the columns result in high percent differences. These differences are not expected to significantly affect project objectives.

Approximately 5.5 percent of the SW8081A data were qualified as estimated and assigned the "J" or "UJ" qualifiers in data validation due to initial calibration verification standards (ICVs) or continuing calibration verification standards (CCVs) that exceeded specified criteria. No sample results were rejected due to exceeded calibration criteria. Due to the nature of the matrix, CCV criterion of $\leq$ 15%D was not met in some analytical runs for some analytes after the analysis of field samples caused increasing interference on the instrument. This problem was noted for the data set from the last sampling events and was also noted by the EPA Region 9 Laboratory. As a result of this difficult matrix, TestAmerica proposed to widen the PEM and CCV criteria to $\leq$ 30%D for all samples that have a total analyte concentration of < 2 ppm or > 20 ppm. This proposal was accepted by EPA, and data were reported by the laboratory accordingly. Therefore, the 15%D was not used by the laboratory for corrective action purposes; however, all data associated with CCVs greater than 15%D on either column were validated and qualified as estimated according to the Functional Guidelines, as described below.

For ICVs or CCVs greater than 15%D with a high bias, only detected results were qualified. For ICVs or CCVs greater than 15%D with a low bias, all detected and non-detected results were qualified. Qualifications due to calibration verification standards that exceeded 15%D indicate potential quantitative uncertainty. High or low bias was generally in the 15-30% range. Refer to the data validation reports for specific information on ICVs and CCVs for specific sample

results. Although quantitatively uncertain, the estimated results are considered usable for decision-making purposes.

Six sample results (0.15 percent of the data) were blank-qualified as non-detected (U) due to a trace detection (result reported as detected below the RL but greater than the MDL) in the associated method blank. No results were qualified for detections above the RL in the method blanks for this analysis. Associated results are generally not assessed and no qualifiers are assigned for blank contamination below the RL, per the QAPP. However, as the blank-qualified results were reported at similar concentrations to the result in the blank, the blank-qualification rules were applied and the following results were blank-qualified. The reported trace results less than the sample-specific RLs for 4,4-DDT in samples C180-3 (0.0038 mg/kg), C185-1 (0.03 mg/kg), and C185-3 (0.0078 mg/kg); and the low concentration results less than two times the RL for 4,4-DDT in samples C183-3 (0.0079 mg/kg), C184-3 (0.0076 mg/kg), and C186-3 (0.0056 mg/kg) were blank-qualified with (U). The blank-qualified results are all less than two times the sample-specific RLs, and the qualifications are not expected to affect project objectives. Note that 4,4'-DDT was also detected in equipment blank EB031308 associated with the results listed above, and in the associated aqueous method blank. No additional qualifiers were required, as the associated field sample results were qualified for the soil method blank.

One sample result (approximately 0.03 percent of the SW8081A data) was qualified as estimated and assigned the "J" qualifier in data validation due to a surrogate recovery exceeding specified control limits. The trace result for 4,4'-DDT in sample C169-7 was qualified as estimated due to a marginally high surrogate recovery. Note that this result is also qualified with the "J" and "PG" laboratory qualifiers for detection between the RL and MDL and for high percent difference between the primary and confirmation columns, respectively. This detected result is considered quantitatively uncertain and may be biased high.

Six sample results (approximately 0.3 percent of the SW8081A data) were qualified as estimated and assigned the "UJ" qualifiers in data validation due to LCS recoveries exceeding specified control limits. The non-detected results for endrin aldehyde in six samples were qualified as estimated due to a 32 %R LCS recovery (35-125 %R control limits). The qualifications are not expected to significantly affect project objectives.

MS/MSD analyses were performed on parent field samples at a frequency of 7.6 percent, exceeding the minimum requirement of 1:20 samples. For most of the MS/MSD analyses, spike recoveries could not be calculated due to the dilutions performed on the samples due to high concentrations of target analytes. For those samples for which MS/MSD recoveries were calculated, the results for the same six non-detected results for endrin aldehyde qualified as estimated for a low LCS recovery (approximately 0.3 percent of the SW8081A data) were additionally qualified for low MS/MSD recoveries of 31 %R and 32 %R (35-125 %R control limits). The qualifications are not expected to significantly affect project objectives.

Field duplicate samples were collected and analyzed at a frequency of 10.5 percent, exceeding the minimum requirement of 1:10 samples. The guideline for RPD between sample and field

duplicate sample results is ≤50 RPD. The RPD value is not defined and is not calculated for field duplicate pairs for which both results are below the RL. For values less than five-times the RL, RPDs are not be used for evaluation. In these cases, the ≤50 RPD guideline may not be appropriate, and results within ±2 RL for soils are considered acceptable. No qualifiers are assigned, as data are not qualified for field duplicate precision according to the Functional Guidelines. For the 15 field duplicate sample pairs (360 results), only seven results exceeded the specified criteria. Approximately 98.1 percent compliance with the precision criteria was achieved for all reported results for the field duplicate samples; therefore field duplicate precision is considered acceptable.

All qualified data were determined to be usable for project objectives in data assessment. The data are considered usable for the purposes of determining pesticide contamination and delineation. PARCC for EPA Method SW8081A is discussed in Section 5.2.

5.1.2 Completeness for EPA Method SW8081A—Pesticides

Results flagged with the "R" qualifier are not considered valid results with respect to completeness. The completeness for EPA Method SW8081A for this project is 100 percent.

Completeness for all EPA Method EPA Method SW8081A analytes is acceptable for this project. The data validation and data usability assessment results indicate the overall acceptable quality of the definitive-level data for EPA Method SW8081A collected for this project. The data meet project objectives and can be used within the constraints of specified qualifiers for decision-making purposes.

5.2 PARCC ASSESSMENT

The following paragraphs discuss the overall data quality in terms of the PARCC goals established for this project.

Precision

Precision measures the reproducibility of the experimental value for the same parameter in the same sample under the same conditions. The parameters evaluated to assess precision during the data validation process are the RPDs for duplicate samples, MS/MSDs, and field duplicates.

The RPDs for the MS/MSDs and sample duplicate analyses were acceptable. None of the data were qualified due to RPD results outside of acceptance criteria. Field duplicate samples were collected for approximately 10.5 percent of sample analyses, and achieved 98.1 percent compliance with the precision criteria for EPA Method SW8081A. Precision is considered acceptable for this data set.

Accuracy

One of the major objectives of the data validation process is to evaluate the accuracy of the data collected. Accuracy measures the deviation between the reported or experimental value and the true value. To assess accuracy, known concentrations of the analytes of interest were spiked into samples and percent recoveries of the spiked analytes were calculated. The parameters evaluated to assess accuracy during the data validation process include surrogate recoveries where applicable, laboratory control samples, and matrix spike recoveries. Additional factors affecting accuracy such as calibration, analyte identification and quantitation were also reviewed.

The surrogate and MS/MSD recoveries are indicators of interference specific to the sample matrix. LCS recoveries are indicators of laboratory performance. When MS/MSD recoveries outside the control limits are compared with acceptable LCS results, matrix related interference is indicated. Spike, surrogate, calibration, quantitation problems, and other accuracy related parameters resulted in the estimation of approximately 5.6 percent of the data, mostly related to calibration verifications exceeding 15 %D. No problems severe enough to significantly affect the usability of the qualified data for decision-making purposes are indicated.

Representativeness

Representativeness measures how accurately the sample data reflect the actual media and environmental conditions being measured. Sampling locations that were representative of the medium being sampled were chosen. Sampling protocols were developed to ensure that samples collected represented the actual medium and that no contamination was introduced during sample collection. Proper sample handling and preservation were observed in the field to ensure that the samples maintained their integrity while being transported to the laboratory for analysis.

The protocols followed by the field crew while collecting the samples were described in the *Revised Quality Assurance Project Plan for Montrose Superfund Site Supplemental Soil Investigation, 20201 South Normandie Avenue, Torrance, California 90502* (Earth Tech, 2005b).

Completeness

Completeness is defined as the percentage of data that are within the acceptance criteria for a given data set and are, therefore, considered valid. Completeness is measured by comparing the total number of acceptable parameters (valid data) against the total number of parameters analyzed. Valid or acceptable data consist of parameters that met all the QC acceptance criteria and parameters that were estimated and qualified as "J" or "UJ" and can still be used for their intended purpose.

The data reviewed for this project showed a completeness of 100 percent for EPA Method SW8081A.

Comparability

Comparability reflects the internal consistency of the measurements and how well the data set can be compared to another data set generated by a different organization. The generation of comparable data requires the use of certified or approved laboratories and established and widely accepted protocols that produce comparable results. Review of the data generated for this project include the use of approved and nationally accepted sampling and testing methods approved by the EPA, thereby ensuring a high degree of comparability.

5.3 ELECTRONIC DATABASE

TestAmerica provided electronic deliverable data (EDDs) to Earth Tech, and a copy of the EDDs are provided on CD in **Appendix E**. Using these EDDs, Earth Tech uploaded the laboratory results into an electronic database. A copy of the database is provided in **Appendix F** on CD in a Microsoft Access format consistent with the Montrose Data Management Plan.

6 INVESTIGATION DERIVED WASTE

IDW was generated daily during soil sampling activities. The IDW consisted of discarded soil samples/cores, decontamination water/fluids, and used PPE. Each day during sampling activities, wastes were collected in 55-gallon steel drums. The drums were sealed, labeled, and transported off-site to the temporary IDW curbed storage pad at the Montrose property at the end of each day of sampling.

IDW characterization samples were collected and analyzed. The waste was subsequently characterized as hazardous waste under 40CFR261.24 and properly manifested for off-site disposal at a Class I facility. The drums of IDW soil and water were transported by Pacific Trans Environmental Services on January 31, 2008 and March 26, 2008 to U.S. Ecology in Beatty, Nevada for treatment and disposal. The IDW PPE was transported by Clean Harbors Environmental Services to the Clean Harbors facility in Aragonite, Utah on February 1, 2008.

Copies of IDW waste sample results, laboratory data, waste profiles, and disposal manifests documenting this process are provided in **Appendix H**. Earth Tech obtained temporary EPA Identification Number CAC002625440 for the IDW, and the waste manifests reflect this project-specific generator identification number.

7 CONCLUSIONS

A total of 34 soil borings were drilled at the JCI property in 2007/2008 to characterize the extent of pesticides in shallow soils. A total of 143 primary soil samples were analyzed for pesticides by EPA Method 8081A. DDT, DDE, and DDD were the most frequently detected pesticides in the soil samples, with frequency of detections between 27% and 90% for the various isomers. Total DDT concentrations in soil ranged from 0.0003 to 36,620 mg/kg, with approximately 15% of the samples exhibiting concentrations above the characterization benchmark of 10 mg/kg. The highest Total DDT concentrations were detected in the northwest corner of the JCI property, adjacent to the office building, warehouse building, and former railroad tracks. In this area, Total DDT concentrations between 2,574 and 36,620 mg/kg were detected at borings C153, C155, C159, and C178. The majority of soil samples with Total DDT concentrations exceeding the benchmark were detected at 1-foot bgs. Below 1-foot bgs, Total DDT impacts to soil in excess of the benchmark were only detected at three locations: C159, C172/181, and C178.

BHC isomers were the second most frequently detected pesticides in the soil samples, with frequency of detections between 16% and 38% for the various isomers. Total BHC concentrations in soil ranged from 0.001 to 50.5 mg/kg, with approximately 7% of the samples exhibiting concentrations above the characterization benchmarks. The highest Total BHC concentrations were detected in the southeast corner of the JCI property at boring C162 and in the northwest corner at borings C153, C159, and C178. Soils with BHC impacts above the benchmarks were co-located with Total DDT impacts in 8 of 10 samples. The majority of soil samples with BHC isomer concentrations exceeding benchmarks were detected at 1-foot bgs. Below 1-foot bgs, BHC impacts to soil in excess of the benchmarks were only detected at three locations: C159, C163, and C178.

The characterization objectives were met by the investigation activities and effectively delineated the lateral and vertical extent of pesticides impacts at the JCI property, including pesticide characterization:

- Of elevated historical pesticide detections
- Along historical truck routes
- In areas where surface staining was observed in historical aerial photos
- In areas potentially affected by aerial dispersion
- Along historical stormwater pathways
- Along an inactive sewer line

All of the pesticide laboratory results were validated in accordance with the Montrose QAPP requirements. None of the soil results were rejected, and all soil results were considered usable for purposes of characterization although a small percentage of results were qualified as either non-detectable or estimated (less than 5.6%). In conclusion, no additional soil sampling is necessary to characterize the nature and extent of pesticides in soil at the JCI property.

8 REFERENCES

American Society for Testing and Materials, 1993, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure),* ASTM Designation D 2488 – 93, 11 pages.

California Department of Water Resources (CDWR). 1961. *Planned Utilization of the Ground Water Basins for the Coastal Plain of Los Angeles County, Appendix A, Ground Water Geology*. Bulletin No.104.

Earth Tech. 2004a. Letter to Ms. Susan Keydel, EPA Region 9. *Proposed Scope of Work for Supplemental Soil Investigation, Jones Chemical Property*, 1401 W. Del Amo Boulevard, Torrance, California. June 30.

Earth Tech. 2005a. *Final Revised Field Sampling Plan for Montrose Superfund Site Supplemental Soil Investigation*, Torrance, California. March.

Earth Tech. 2005b. *Revised Quality Assurance Project Plan for Montrose Superfund Site Supplemental Soil Investigation*, Torrance, California. March.

Earth Tech. 2005c. *Addendum to Final Revised Field Sampling Plan, Supplemental Soils Investigation, Montrose Superfund Site, Jones Chemical Property*, 1401 W. Del Amo Boulevard, Torrance, California. August 17.

Earth Tech. 2007a. Email to Mr. Russell Mechem, EPA Region 9. Jones Chemical Property – Photograph. August 15.

Earth Tech. 2007b. Email to Mr. Russell Mechem, EPA Region 9. Draft Preliminary Schedule for Supplemental Soil Sampling, Jones Chemical Property. September 4.

Earth Tech. 2008. *Supplemental Soil Investigation Report*, Jones Chemical Property, 1401 W. Del Amo Boulevard, Torrance, CA 90501. October 8.

Levine-Fricke. 1995. *Preliminary Endangerment Assessment (PEA), Jones Chemical Facility, Torrance, California*. Volumes I and II. June 28.

Levine-Fricke. 2008. *Draft Remedial Investigation Workplan*, JCI Jones Chemicals Inc., Torrance, California. November 21.

Los Angeles, City of. 1996. *Harbor Gateway Community Plan.* December 6.

U.S. EPA. 1998. *Final Remedial Investigation Report for Montrose Superfund Site.* Prepared by CH2M HILL. May 18.

U.S. Environmental Protection Agency. 1999. *National Functional Guidelines for Organic Data Review*. EPA/540/R-99/008. October.

U.S. EPA. 2005a. Letter to Mr. Joseph Kelly, Montrose Chemical Corporation, *Conditional Approval of Final Revised Field Sampling Plan, Supplemental Soils Investigation, Montrose Superfund Site*. March 16.

U.S. EPA. 2005b. Letter to Mr. Joseph Kelly, Montrose Chemical Corporation, *Conditional Approval of Revised Quality Assurance Project Plan, Supplemental Soils Investigation, Montrose Superfund Site*. March 24.

U.S. EPA. 2007. Letter to Mr. Joseph Kelly, Montrose Chemical Corporation, *Conditional Approval of Addendum to Final Revised Field Sampling Plan, Supplemental Soils Investigation, Montrose Superfund Site*. September 7.

U.S. EPA. 2009. Letter to Mr. Joseph Kelly, Montrose Chemical Corporation, EPA Comments on the *Supplemental Soil Investigation Report, Jones Chemical Property, 1401 W. Del Amo Boulevard, Torrance, California, Earth Tech AECOM, October 8, 2008, Montrose Superfund Site*. January 16.

TABLES

TABLE 1
SUMMARY OF SOIL BORING SURVEY COORDINATES
Supplemental Soil Investigation
Jones Chemical Property

	Original Survey Locations			Resurveyed Locations			Final Survey Locations		
Point	Easting	Northing	Elevation	Easting	Northing	Elevation	Easting	Northing	Elevation
C153	6469682.37	1767311.10	48.62	--	--	--	6469682.37	1767311.10	48.62
C154	6469694.21	1767283.77	48.02	--	--	--	6469694.21	1767283.77	48.02
C155	6470033.27	1767225.67	--	6469770.39	1767284.28	49.29	6469770.39	1767284.28	49.29
C156	6469862.03	1767284.44	47.68	--	--	--	6469862.03	1767284.44	47.68
C157	6470029.40	1767279.88	48.85	--	--	--	6470029.40	1767279.88	48.85
C158	6469843.47	1767213.47	48.33	--	--	--	6469843.47	1767213.47	48.33
C159	6469812.35	1767175.09	49.16	--	--	--	6469812.35	1767175.09	49.16
C160B	6469891.94	1767154.29	--	6469891.52	1767158.61	47.68	6469891.52	1767158.61	47.68
C161	6469844.05	1767146.69	47.76	--	--	--	6469844.05	1767146.69	47.76
C162	6469765.50	1767092.76	--	6470330.63	1767092.68	45.87	6470330.63	1767092.68	45.87
C163	6470380.31	1767025.34	45.43	--	--	--	6470380.31	1767025.34	45.43
C164	6469961.39	1767091.32	--	6469994.74	1766978.95	44.01	6469994.74	1766978.95	44.01
C165	6470056.23	1767110.67	--	6470163.01	1766977.18	43.86	6470163.01	1766977.18	43.86
C166	6469821.02	1766993.91	45.05	--	--	--	6469821.02	1766993.91	45.05
C167B	6469847.59	1767082.74	46.20	--	--	--	6469847.59	1767082.74	46.20
C168	6470330.22	1767093.01	--	6469977.42	1767146.06	48.45	6469977.42	1767146.06	48.45
C169	6470094.94	1767144.14	47.54	--	--	--	6470094.94	1767144.14	47.54
C170	6470159.47	1767096.72	47.47	--	--	--	6470159.47	1767096.72	47.47
C171B	6469970.23	1767237.13	48.09	--	--	--	6469970.23	1767237.13	48.09
C172	6470073.11	1767007.72	--	6470042.46	1767217.43	48.68	6470042.46	1767217.43	48.68
C173	6470173.91	1766999.49	--	6470248.46	1767053.52	46.76	6470248.46	1767053.52	46.76
C174	6470045.39	1767101.83	47.52	--	--	--	6470045.39	1767101.83	47.52
C175	6470372.79	1767004.92	--	6469911.19	1767012.54	44.96	6469911.19	1767012.54	44.96
C176	6469775.62	1767086.92	45.09	--	--	--	6469775.62	1767086.92	45.09
C177B	6469815.05	1766983.64	--	6469708.88	1766995.71	47.81	6469708.88	1766995.71	47.81
C178	6469818.06	1767262.99	49.04	--	--	--	6469818.06	1767262.99	49.04
C179	6469691.03	1767244.45	47.40	--	--	--	6469691.03	1767244.45	47.40
C180	6469874.14	1767211.73	47.91	--	--	--	6469874.14	1767211.73	47.91
C181	6470042.16	1767217.94	48.66	--	--	--	6470042.16	1767217.94	48.66
C182	6469869.57	1767104.93	46.91	--	--	--	6469869.57	1767104.93	46.91
C183	6469707.89	1767028.65	47.93	--	--	--	6469707.89	1767028.65	47.93
C184	6469827.84	1767058.86	45.19	--	--	--	6469827.84	1767058.86	45.19
C185	6470317.30	1767064.05	45.90	--	--	--	6470317.30	1767064.05	45.90
C186	6469739.35	1766997.27	46.89	--	--	--	6469739.35	1766997.27	46.89

Notes:
-- = not applicable/not available
All points surveyed by WM Surveys Inc.
Elevations reported in feet above mean sea level (AMSL)
BENCHMARK:
VERTICAL DATUM NGVD29
CITY OF LOS ANGELES BM @21-02268 SPBM "STAMPED 21-02268 1983"
EAST CURB NORMANDIE AVE, 38' SOUTH OF BCR SOUTH OF FRANCISCO ST
1985 ELEV= 46.525 FEET NGVD29
Z Accuracy = 0.5cm
HORIZONTAL DATUM NAD83
XY Accuracy = 1cm
NGS PID STATIONS AI4438 AND AJ1853 EPOCH DATE 2000.35

TABLE 2
FINAL SOIL SAMPLING SCHEDULE
Supplemental Soil Investigation
Jones Chemical Property

Boring Location Information						Soil Sampling Depth (feet, bgs)								
Date	Sampling Location To Be Completed	Total Depth (feet bgs)	Boring I.D.	Drill Rig/ Sampling Type	Sample ID **XX=depth** (in feet bgs)	1-foot	3-feet	5-feet	7-feet	10-feet	15-feet	20-feet	Pesticides (8081A)	**Total Samples Submitted to the Lab**
Day 1	C176	10	Equipment Blank		**EB110507**								X	
November 5, 2007	C166	10	C176	DP	**C176-XX**	X	X	X	X	X			X	
Monday	C153	10	Duplicate		**C176-103**		D						X	
	C154	10	C166	DP	**C166-XX**	X	X	X	X	X			X	**Equipment Blank = 1**
	C155	10	Duplicate		**C166-101**	D							X	**Pesticides = 25**
			C153	DP	**C153-XX**	X	X	X	X	X			X	**Duplicate = 3**
			C154	DP	**C154-XX**	X	X	X	X	X			X	**MS/MSD = 1**
			Duplicate		**C154-101**	D							X	
			C155	DP	**C155-XX**	X	X	X	X	X			X	
			MS/MSD		**C155-5**			M					X	
Day 2	C157	10	Equipment Blank		**EB110607**								X	
November 6, 2007	C156	10	C157	DP	**C157-XX**	X	X	X	X	X			X	
Tuesday	C158	10	C156	DP	**C156-XX**	X	X	X	X	X			X	
	C168	10	Duplicate		**C156-105**			D					X	**Equipment Blank = 1**
	C171	10	C158	DP	**C158-XX**	X	X	X	X	X			X	**Pesticides = 25**
			MS/MSD		**C158-7**				M				X	**Duplicate = 2**
			C168	DP	**C168-XX**	X	X	X	X	X			X	**MS/MSD = 2**
			MS/MSD		**C168-10**					M			X	
			C171	DP	**C171-XX**	X	X	X	X	X			X	
			Duplicate		**C171-107**				D				X	
Day 3	C167B	10	Equipment Blank		**EB110707**								X	
November 7, 2007	C160B	10	C167B	DP	**C167B-XX**	X	X	X	X	X			X	
Wednesday	C161	10	C160B	DP	**C160B-XX**	X	X	X	X	X			X	
	C164	10	C161	DP	**C161-XX**	X	X	X	X	X			X	
	C165	10	Duplicate		**C161-105**			D					X	**Equipment Blank = 1**
	C175	10	C164	HA	**C164-XX**	X	X	X	X	X			X	**Pesticides = 30**
			Duplicate		**C164-103**		D						X	**Duplicate = 3**
			C165	HA	**C165-XX**	X	X	X	X	X			X	**MS/MSD = 1**
			Duplicate		**C165-110**					D			X	
			C175	DP	**C175-XX**	X	X	X	X	X			X	
			MS/MSD		**C175-3**		M						X	
Day 4	C177B	10	Equipment Blank		**EB110807**								X	
November 8, 2007	C159	10	C177B	HA	**C177B-XX**	X	X	X	X	X			X	
Thursday	C169	10	MS/MSD		**C177B-1**	M							X	
	C172	10	C159	DP	**C159-XX**	X	X	X	X	X			X	
	C173	10	Duplicate		**C159-103**		D						X	**Equipment Blank = 1**
			C169	DP	**C169-XX**	X	X	X	X	X			X	**Pesticides = 25**
			Duplicate		**C169-110**					D			X	**Duplicate = 3**
			C172	DP	**C172-XX**	X	X	X	X	X			X	**MS/MSD = 2**
			Duplicate		**C172-107**				D				X	
			C173	DP	**C173-XX**	X	X	X	X	X			X	
			MS/MSD		**C173-5**			M					X	
Day 5	C163	10	Equipment Blank		**EB110907**								X	
November 9, 2007	C162	10	C163	HA	**C163-XX**	X	X	X	X	X			X	
Friday	C170	10	C162	DP	**C162-XX**	X	X	X	X	X			X	**Equipment Blank = 1**
	C174	10	Duplicate		**C162-105**			D					X	**Pesticides = 20**
			C170	DP	**C170-XX**	X	X	X	X	X			X	**Duplicate = 2**
			Duplicate		**C170-101**	D							X	
			C174	DP	**C174-XX**	X	X	X	X	X			X	
Day 6	C179	3	Equipment Blank		**EB031308**								X	
March 13, 2008	C178	3	C179	DP	**C179-XX**	X	X						X	
	C180	3	C178	DP	**C178-XX**	X	X						X	
	C181	20	Duplicate		**C178-103**		D						X	
	C185	3	C180	DP	**C180-XX**	X	X						X	
	C182	3	C181	DP	**C181-XX**						X	X	X	**Equipment Blank = 1**
	C184	3	Duplicate		**C181-120**							D	X	**Pesticides =18**
	C186	3	C185	DP	**C185-XX**	X	X						X	**Duplicate =2**
	C183	3	C182	DP	**C182-XX**	X	X						X	**MS/MSD = 1**
			C184	DP	**C184-XX**	X	X						X	
			C186	DP	**C186-XX**	X	X						X	
			C183	DP	**C183-XX**	X	X						X	
			MS/MSD		**C183-1**		M						X	

Notes:

bgs = below grade surface
DP = Direct Push
HA= Hand Auger
X = Pesticides Sample Symbol
D = Duplicate soil sample to be collected
M = Matrix spike (MS)/Matrix spike duplicate (MSD) sample for laboratory

Table 3
Summary of Pesticide Detections (all samples)
JCI Property Supplemental Soil Investigation (2007/2008)

Chemical Constituent	Number of Primary Samples Tested	Number of Detections	Frequency of Detections	Average Concentration of Detections (mg/kg)	Maximum Detected Concentration (mg/kg)
EPA Method 8081A					
aldrin	143	0	0.0%	ND	ND
alpha-BHC	143	39	27.3%	1.124	16.000
beta-BHC	143	54	37.8%	1.029	22.000
delta-BHC	143	23	16.1%	1.714	28.000
gamma-BHC	143	38	26.6%	1.105	24.000
alpha-chlordane	143	1	0.7%	0.040	0.040
gamma-chlordane	143	3	2.1%	0.002	0.003
2,4'-DDD	143	59	41.3%	15.840	530.000
2,4'-DDE	143	39	27.3%	2.414	26.000
2,4'-DDT	143	101	70.6%	113.457	6,000.000
4,4'-DDD	143	113	79.0%	35.397	1,700.000
4,4'-DDE	143	115	80.4%	11.112	390.000
4,4'-DDT	143	129	90.2%	403.670	28,000.000
dieldrin	143	0	0.0%	ND	ND
alpha-endosulfan	143	0	0.0%	ND	ND
beta-endosulfan	143	0	0.0%	ND	ND
endosulfan sulfate	143	2	1.4%	0.001	0.001
endrin	143	0	0.0%	ND	ND
endrin aldehyde	143	0	0.0%	ND	ND
endrin ketone	143	0	0.0%	ND	ND
heptachlor	143	1	0.7%	0.001	0.001
heptachlor epoxide	143	0	0.0%	ND	ND
methoxychlor	143	0	0.0%	ND	ND
toxaphene	143	0	0.0%	ND	ND

Notes:

mg/kg = milligrams per kilogram

ND = not detected

For samples with duplicate results, the higher of the two concentrations are shown in this table

Yellow highlighting indicates constituents with at least one detected concentration

Table 4
Final Validated Total DDT Concentrations in Soil
JCI Property Supplemental Soil Investigation (2007/2008)

Borehole ID	Total DDT Concentrations (mg/kg) Sampling Interval (feet below ground surface)						
	1	3	5	7	10	15	20
C153	2,574.000	0.066	0.025	0.093	0.089	NS	NS
C154	482.400	0.009	0.015	0.016	0.078	NS	NS
C155	3,498.000	0.627	0.067	0.074	0.013	NS	NS
C156	0.064	1.580	0.155	0.002	0.001	NS	NS
C157	<1.6	<1.6	<0.084	<0.0040	0.001	NS	NS
C158	433.700	0.015	0.011	0.028	0.006	NS	NS
C159	7,800.000	1,705.000	20.970	111.500	0.063	NS	NS
C160B	0.203	0.018	0.003	0.001	<0.0044	NS	NS
C161	0.591	0.012	2.177	0.006	0.001	NS	NS
C162	620.000	0.734	1.716	0.069	0.018	NS	NS
C163	3.802	0.012	6.733	0.100	0.031	NS	NS
C164	0.068	0.014	0.017	0.275	0.117	NS	NS
C165	11.250	5.670	0.161	0.137	0.234	NS	NS
C166	12.560	0.007	0.007	0.005	0.023	NS	NS
C167B	239.800	0.092	0.014	0.001	0.219	NS	NS
C168	6.960	0.003	0.015	<0.0039	0.002	NS	NS
C169	0.049	1.984	0.013	0.001	0.005	NS	NS
C170	14.210	0.353	0.120	0.011	0.004	NS	NS
C171	0.094	0.003	0.012	0.003	0.0003	NS	NS
C172	3.370	9.270	689.300	201.900	15.570	NS	NS
C173	4.030	3.600	7.860	0.255	0.219	NS	NS
C174	0.216	<0.0040	0.010	<0.0038	<0.0041	NS	NS
C175	6.840	<0.040	0.083	<0.0042	1.364	NS	NS
C176	4.470	0.431	<0.0041	0.001	0.015	NS	NS
C177B	1,283.000	2.608	0.334	2.826	1.760	NS	NS
C178	36,620.000	13,350.000	NS	NS	NS	NS	NS
C179	23.710	2.845	NS	NS	NS	NS	NS
C180	5.803	0.006	NS	NS	NS	NS	NS
C181	NS	NS	NS	NS	NS	0.877	16.080
C182	0.051	0.129	NS	NS	NS	NS	NS
C183	0.298	0.012	NS	NS	NS	NS	NS
C184	0.099	0.010	NS	NS	NS	NS	NS
C185	0.068	0.022	NS	NS	NS	NS	NS
C186	0.125	0.010	NS	NS	NS	NS	NS

Notes:
mg/kg = Milligrams per kilogram
NS = Not sampled.
Total DDT concentrations are sum of 2,4' and 4,4' isomers for DDD, DDE, and DDT
For samples with duplicate results, the higher of the two concentrations are shown in this table
Yellow highlighting indicates samples with Total DDT greater than characterization benchmark of 10 mg/kg

Table 5
Total DDT Isomers Exceeding Characterization Goals
JCI Property Supplemental Soil Investigation (2007/2008)

Sample ID	DDD (mg/kg)	DDE (mg/kg)	DDT (mg/kg)	Total DDT (mg/kg)	Percent of Total DDT		
					DDD	DDE	DDT
C178-1	2,230.0	390.0	34,000.0	36,620.0	6.1%	1.1%	92.8%
C178-103	940.0	210.0	12,200.0	13,350.0	7.0%	1.6%	91.4%
C159-1	860.0	140.0	6,800.0	7,800.0	11.0%	1.8%	87.2%
C155-1	160.0	48.0	3,290.0	3,498.0	4.6%	1.4%	94.1%
C153-1	159.0	75.0	2,340.0	2,574.0	6.2%	2.9%	90.9%
C159-3	160.0	35.0	1,510.0	1,705.0	9.4%	2.1%	88.6%
C177B-1	99.0	54.0	1,130.0	1,283.0	7.7%	4.2%	88.1%
C172-5	21.8	90.5	577.0	689.3	3.2%	13.1%	83.7%
C162-1	15.0	66.0	539.0	620.0	2.4%	10.6%	86.9%
C154-101	170.0	17.4	295.0	482.4	35.2%	3.6%	61.2%
C158-1	33.7	11.0	389.0	433.7	7.8%	2.5%	89.7%
C167B-1	38.0	17.8	184.0	239.8	15.8%	7.4%	76.7%
C172-107	9.9	142.0	50.0	201.9	4.9%	70.3%	24.8%
C159-7	10.0	1.5	100.0	111.5	9.0%	1.3%	89.7%
C179-1	4.5	0.6	18.6	23.7	19.0%	2.6%	78.4%
C159-5	1.4	2.2	17.4	21.0	6.7%	10.3%	83.0%
C181-20	0.5	6.6	9.0	16.1	3.2%	40.8%	56.0%
C172-10	1.8	11.5	2.3	15.6	11.4%	73.9%	14.7%
C170-1	0.4	1.1	12.7	14.2	2.9%	7.7%	89.4%
C166-101	4.1	6.2	2.3	12.6	32.6%	49.4%	18.0%
C165-1	0.6	4.7	6.0	11.3	5.2%	41.7%	53.1%
Average					**10.1%**	**16.7%**	**73.2%**

Notes:

mg/kg = Milligrams per kilogram

Concentrations are the sum of 2,4' and 4,4' isomers

For samples with duplicate results, the higher of the two concentrations are shown in this table.

Yellow highlighting indicates samples with Total DDT greater than the characterization benchmark of 10 mg/kg.

Table 6
Final Validated Total BHC Isomers Concentrations in Soil
JCI Property Supplemental Soil Investigation (2007/2008)

Borehole ID	Total BHC Concentrations (mg/kg) Sampling Interval (feet below ground surface)						
	1	3	5	7	10	15	20
C153	37.800	<0.0040	<0.0019	<0.0096	<0.0042	NS	NS
C154	3.300	0.008	<0.0019	<0.0020	0.001	NS	NS
C155	<200	<0.040	<0.0040	<0.0040	<0.0041	NS	NS
C156	0.119	<0.40	0.024	<0.0020	<0.0022	NS	NS
C157	<0.81	<0.81	<0.042	<0.0020	0.000	NS	NS
C158	9.600	<0.020	<0.010	<0.0020	<0.0020	NS	NS
C159	<1,000	28.000	0.207	<1.9	<0.010	NS	NS
C160B	<0.0036	<0.0020	<0.0020	<0.0020	<0.0022	NS	NS
C161	<0.010	0.283	0.019	<0.0020	<0.0019	NS	NS
C162	50.500	0.088	0.193	0.014	0.007	NS	NS
C163	7.400	0.025	2.802	0.267	0.049	NS	NS
C164	0.039	0.012	0.022	0.008	0.009	NS	NS
C165	<1.1	<0.41	<0.0044	<0.0044	<0.0046	NS	NS
C166	0.460	<0.0019	<0.0020	<0.0021	<0.0021	NS	NS
C167B	<3.6	0.053	0.003	0.001	0.002	NS	NS
C168	0.027	<0.0020	0.001	0.001	<0.0021	NS	NS
C169	<0.010	<0.041	<0.020	<0.0019	<0.0020	NS	NS
C170	<2.1	<0.010	<0.0041	<0.0019	<0.0020	NS	NS
C171	0.001	<0.0020	<0.0020	<0.0019	0.000	NS	NS
C172	0.004	0.140	<9.0	<4.4	<1.2	NS	NS
C173	<0.40	0.080	0.270	0.019	0.050	NS	NS
C174	0.075	<0.0020	<0.0020	<0.0019	<0.0021	NS	NS
C175	0.710	0.007	0.008	0.006	0.010	NS	NS
C176	0.058	0.023	<0.0021	<0.0021	<0.0022	NS	NS
C177B	5.500	0.031	0.010	0.029	<0.097	NS	NS
C178	<450	29.400	NS	NS	NS	NS	NS
C179	1.700	0.178	NS	NS	NS	NS	NS
C180	<0.095	<0.0020	NS	NS	NS	NS	NS
C181	NS	NS	NS	NS	NS	0.019	0.213
C182	0.062	<0.0026	NS	NS	NS	NS	NS
C183	0.006	<0.0020	NS	NS	NS	NS	NS
C184	0.021	<0.0020	NS	NS	NS	NS	NS
C185	0.255	0.098	NS	NS	NS	NS	NS
C186	0.020	0.001	NS	NS	NS	NS	NS

Notes:

mg/kg = Milligrams per kilogram

NS = Not sampled

Total BHC concentrations are the sum of alpha, beta, delta, and gamma isomers

For samples with duplicate results, the higher of the two concentrations are shown on this table

Yellow highlighting indicates samples with BHC isomer concentrations exceeding characterization benchmarks:

EPA Region 9 PRGs: alpha BHC = 0.36; beta BHC = 1.3; gamma BHC = 1.7 mg/kg

Table 7
Total BHC Isomers Exceeding Characterization Goals
JCI Property Supplemental Soil Investigation (2007/2008)

Sample ID	alpha-BHC (mg/kg)	beta-BHC (mg/kg)	delta-BHC (mg/kg)	gamma-BHC (mg/kg)	Total BHC (mg/kg)	Percent of Total BHC			
EPA PRG	**0.36**	**1.3**	**NA**	**1.7**	**NA**	**alpha**	**beta**	**delta**	**gamma**
C162-1	4.5	22.0	<19	24.0	50.5	8.9%	43.6%	0.0%	47.5%
C153-1	16.0	9.0	7.0	5.8	37.8	42.3%	23.8%	18.5%	15.3%
C178-3	14.0	4.2	3.0	8.2	29.4	47.6%	14.3%	10.2%	27.9%
C159-103	<100	<100	28.0	<100	28.0	0.0%	0.0%	100.0%	0.0%
C158-1	5.1	<10	1.1	3.4	9.6	53.1%	0.0%	11.5%	35.4%
C163-1	0.1	7.1	0.2	0.1	7.4	0.7%	95.9%	2.4%	0.9%
C177B-1	<20	5.5	<20	<20	5.5	0.0%	100.0%	0.0%	0.0%
C154-101	3.3	<10	<10	<10	3.3	100.0%	0.0%	0.0%	0.0%
C163-5	0.0	2.7	0.1	0.0	2.8	0.6%	96.4%	2.2%	0.7%
C179-1	<2.1	1.7	<2.1	<2.1	1.7	0.0%	100.0%	0.0%	0.0%
Average						**25.3%**	**47.4%**	**14.5%**	**12.8%**

Notes:

mg/kg = Milligrams per kilogram

NA = Not applicable

Total BHC concentrations are the sum of alpha, beta, delta, and gamma isomers

For samples with duplicate results, the higher of the two concentrations are shown on this table

Yellow highlighting indicates samples with BHC isomer concentrations exceeding characterization benchmarks:

EPA Region 9 PRGs: alpha BHC = 0.36; beta BHC = 1.3; gamma BHC = 1.7 mg/kg

There were additionally 15 soil samples where no BHC isomers were detected but the reporting limit exceeded at least one of the benchmarks

Table 8
November 2007 and March 2008 Analytical Sample Summary
JCI Property Supplemental Soil Investigation

SDG	Lab ID	Field Sample ID	Matrix/ Sample Type	Date Sampled	Level of Validation	SW8081A	D2216
G7K060348	001	C153-7	Soil	11/5/2007	III	Y	Y
G7K060348	002	C153-10	Soil	11/5/2007	III	Y	Y
G7K060348	003	C154-1	Soil	11/5/2007	III	Y[(b)]	Y[(b)]
G7K060348	004	C154-101	Field Duplicate Soil	11/5/2007	III	Y[(b)]	Y[(b)]
G7K060348	005	C154-3	Soil	11/5/2007	III	Y	Y
G7K060348	006	C154-5	Soil	11/5/2007	III	Y	Y
G7K060348	007	C154-7	Soil	11/5/2007	III	Y	Y
G7K060348	008	C154-10	Soil	11/5/2007	III	Y	Y
G7K060348	009	C155-1	Soil	11/5/2007	III	Y	Y
G7K060348	010	C155-3	Soil	11/5/2007	III	Y	Y
G7K060348	011	C155-5	Soil	11/5/2007	III	Y[(a)]	Y
G7K060348	012	C155-7	Soil	11/5/2007	III	Y	Y
G7K060348	013	C155-10	Soil	11/5/2007	III	Y	Y[(a)]
G7K060352	001	EB110507	Equipment Blank	11/5/2007	IV	Y	
G7K060352	002	C176-1	Soil	11/5/2007	IV	Y	Y
G7K060352	003	C176-3	Soil	11/5/2007	IV	Y[(b)]	Y[(b)]
G7K060352	004	C176-103	Field Duplicate Soil	11/5/2007	IV	Y[(a,b)]	Y[(b)]
G7K060352	005	C176-5	Soil	11/5/2007	IV	Y	Y
G7K060352	006	C176-7	Soil	11/5/2007	IV	Y	Y
G7K060352	007	C176-10	Soil	11/5/2007	IV	Y	Y
G7K060352	008	C166-1	Soil	11/5/2007	IV	Y[(b)]	Y[(b)]
G7K060352	009	C166-101	Field Duplicate Soil	11/5/2007	IV	Y[(b)]	Y[(b)]
G7K060352	010	C166-3	Soil	11/5/2007	IV	Y	Y
G7K060352	011	C166-5	Soil	11/5/2007	IV	Y	Y
G7K060352	012	C166-7	Soil	11/5/2007	IV	Y	Y
G7K060352	013	C166-10	Soil	11/5/2007	IV	Y	Y
G7K060352	014	C153-1	Soil	11/5/2007	IV	Y	Y
G7K060352	015	C153-3	Soil	11/5/2007	IV	Y	Y
G7K060352	016	C153-5	Soil	11/5/2007	IV	Y	Y
G7K070431	001	C158-7	Soil	11/6/2007	III	Y[(a)]	Y
G7K070431	002	C158-10	Soil	11/6/2007	III	Y	Y
G7K070431	003	C168-1	Soil	11/6/2007	III	Y	Y[(a)]
G7K070431	004	C168-3	Soil	11/6/2007	III	Y	Y
G7K070431	005	C168-5	Soil	11/6/2007	III	Y	Y
G7K070431	006	C168-7	Soil	11/6/2007	III	Y	Y
G7K070431	007	C168-10	Soil	11/6/2007	III	Y[(a)]	Y
G7K070431	008	C171-1	Soil	11/6/2007	III	Y	Y
G7K070431	009	C171-3	Soil	11/6/2007	III	Y	Y
G7K070431	010	C171-5	Soil	11/6/2007	III	Y	Y
G7K070431	011	C171-7	Soil	11/6/2007	III	Y[(b)]	Y[(b)]
G7K070431	012	C171-107	Field Duplicate Soil	11/6/2007	III	Y[(b)]	Y[(b)]
G7K070431	013	C171-10	Soil	11/6/2007	III	Y	Y
G7K070437	001	EB110607	Equipment Blank	11/6/2007	III	Y	
G7K070437	002	C157-1	Soil	11/6/2007	III	Y[(a)]	Y
G7K070437	003	C157-3	Soil	11/6/2007	III	Y	Y
G7K070437	004	C157-5	Soil	11/6/2007	III	Y	Y
G7K070437	005	C157-7	Soil	11/6/2007	III	Y	Y
G7K070437	006	C157-10	Soil	11/6/2007	III	Y	Y
G7K070437	007	C156-1	Soil	11/6/2007	III	Y	Y
G7K070437	008	C156-3	Soil	11/6/2007	III	Y	Y
G7K070437	009	C156-5	Soil	11/6/2007	III	Y[(b)]	Y[(b)]

Table 8
November 2007 and March 2008 Analytical Sample Summary
JCI Property Supplemental Soil Investigation

SDG	Lab ID	Field Sample ID	Matrix/ Sample Type	Date Sampled	Level of Validation	SW8081A	D2216
G7K070437	010	C156-105	Field Duplicate Soil	11/6/2007	III	Y[b]	Y[b]
G7K070437	011	C156-7	Soil	11/6/2007	III	Y	Y[a]
G7K070437	012	C156-10	Soil	11/6/2007	III	Y	Y
G7K070437	013	C158-1	Soil	11/6/2007	III	Y	Y
G7K070437	014	C158-3	Soil	11/6/2007	III	Y	Y
G7K070437	015	C158-5	Soil	11/6/2007	III	Y	Y
G7K080406	001	EB110707	Equipment Blank	11/7/2007	III	Y	
G7K080406	002	C167B-1	Soil	11/7/2007	III	Y	Y
G7K080406	003	C167B-3	Soil	11/7/2007	III	Y	Y
G7K080406	004	C167B-5	Soil	11/7/2007	III	Y	Y
G7K080406	005	C167B-7	Soil	11/7/2007	III	Y	Y
G7K080406	006	C167B-10	Soil	11/7/2007	III	Y	Y
G7K080406	007	C160B-1	Soil	11/7/2007	III	Y	Y
G7K080406	008	C160B-3	Soil	11/7/2007	III	Y[a]	Y
G7K080406	009	C160B-5	Soil	11/7/2007	III	Y	Y
G7K080406	010	C160B-7	Soil	11/7/2007	III	Y	Y
G7K080406	011	C160B-10	Soil	11/7/2007	III	Y	Y
G7K080406	012	C161-1	Soil	11/7/2007	III	Y	Y
G7K080406	013	C161-3	Soil	11/7/2007	III	Y	Y
G7K080406	014	C161-5	Soil	11/7/2007	III	Y[b]	Y[b]
G7K080406	015	C161-105	Field Duplicate Soil	11/7/2007	III	Y[b]	Y[b]
G7K080406	016	C161-7	Soil	11/7/2007	III	Y	Y
G7K080406	017	C161-10	Soil	11/7/2007	III	Y	Y
G7K080407	001	C164-1	Soil	11/7/2007	III	Y	Y
G7K080407	002	C164-3	Soil	11/7/2007	III	Y[b]	Y[b]
G7K080407	003	C164-103	Field Duplicate Soil	11/7/2007	III	Y[b]	Y[b]
G7K080407	004	C164-5	Soil	11/7/2007	III	Y	Y[a]
G7K080407	005	C164-7	Soil	11/7/2007	III	Y	Y
G7K080407	006	C164-10	Soil	11/7/2007	III	Y	Y
G7K080407	007	C165-1	Soil	11/7/2007	III	Y	Y
G7K080407	008	C165-3	Soil	11/7/2007	III	Y	Y
G7K080407	009	C165-5	Soil	11/7/2007	III	Y	Y
G7K080407	010	C165-7	Soil	11/7/2007	III	Y	Y
G7K080407	011	C165-10	Soil	11/7/2007	III	Y[b]	Y[b]
G7K080407	012	C165-110	Field Duplicate Soil	11/7/2007	III	Y[b]	Y[b]
G7K080407	013	C175-1	Soil	11/7/2007	III	Y	Y
G7K080407	014	C175-3	Soil	11/7/2007	III	Y[a]	Y
G7K080407	015	C175-5	Soil	11/7/2007	III	Y	Y
G7K080407	016	C175-7	Soil	11/7/2007	III	Y	Y
G7K080407	017	C175-10	Soil	11/7/2007	III	Y	Y
G7K090408	001	EB110807	Equipment Blank	11/8/2007	III	Y	
G7K090408	002	C177B-1	Soil	11/8/2007	III	Y[a]	Y
G7K090408	003	C177B-3	Soil	11/8/2007	III	Y	Y
G7K090408	004	C177B-5	Soil	11/8/2007	III	Y	Y
G7K090408	005	C177B-7	Soil	11/8/2007	III	Y	Y
G7K090408	006	C177B-10	Soil	11/8/2007	III	Y	Y
G7K090408	007	C159-1	Soil	11/8/2007	III	Y	Y
G7K090408	008	C159-3	Soil	11/8/2007	III	Y[b]	Y[b]
G7K090408	009	C159-103	Field Duplicate Soil	11/8/2007	III	Y[b]	Y[b]
G7K090408	010	C159-5	Soil	11/8/2007	III	Y	Y
G7K090408	011	C159-7	Soil	11/8/2007	III	Y	Y
G7K090408	012	C159-10	Soil	11/8/2007	III	Y	Y
G7K090408	013	C169-1	Soil	11/8/2007	III	Y	Y
G7K090408	014	C169-3	Soil	11/8/2007	III	Y	Y[a]

Table 8
November 2007 and March 2008 Analytical Sample Summary
JCI Property Supplemental Soil Investigation

SDG	Lab ID	Field Sample ID	Matrix/ Sample Type	Date Sampled	Level of Validation	SW8081A	D2216
G7K090408	015	C169-5	Soil	11/8/2007	III	Y	Y
G7K090409	001	C169-7	Soil	11/8/2007	III	Y	Y
G7K090409	002	C169-10	Soil	11/8/2007	III	Y[(b)]	Y[(b)]
G7K090409	003	C169-110	Field Duplicate Soil	11/8/2007	III	Y[(b)]	Y[(b)]
G7K090409	004	C172-1	Soil	11/8/2007	III	Y	Y
G7K090409	005	C172-3	Soil	11/8/2007	III	Y	Y
G7K090409	006	C172-5	Soil	11/8/2007	III	Y	Y
G7K090409	007	C172-7	Soil	11/8/2007	III	Y[(b)]	Y[(b)]
G7K090409	008	C172-107	Field Duplicate Soil	11/8/2007	III	Y[(b)]	Y[(b)]
G7K090409	009	C172-10	Soil	11/8/2007	III	Y	Y
G7K090409	010	C173-1	Soil	11/8/2007	III	Y	Y
G7K090409	011	C173-3	Soil	11/8/2007	III	Y	Y
G7K090409	012	C173-5	Soil	11/8/2007	III	Y[(a)]	Y
G7K090409	013	C173-7	Soil	11/8/2007	III	Y	Y
G7K090409	014	C173-10	Soil	11/8/2007	III	Y	Y
G7K100235	001	C170-1	Soil	11/9/2007	III	Y[(b)]	Y[(b)]
G7K100235	002	C170-101	Field Duplicate Soil	11/9/2007	III	Y[(a,b)]	Y[(b)]
G7K100235	003	C170-3	Soil	11/9/2007	III	Y	Y
G7K100235	004	C170-5	Soil	11/9/2007	III	Y	Y
G7K100235	005	C170-7	Soil	11/9/2007	III	Y	Y
G7K100235	006	C170-10	Soil	11/9/2007	III	Y	Y
G7K100235	007	C174-1	Soil	11/9/2007	III	Y	Y[(a)]
G7K100235	008	C174-3	Soil	11/9/2007	III	Y	Y
G7K100235	009	C174-5	Soil	11/9/2007	III	Y	Y
G7K100235	010	C174-7	Soil	11/9/2007	III	Y	Y
G7K100235	011	C174-10	Soil	11/9/2007	III	Y	Y
G7K100236	001	EB110907	Equipment Blank	11/9/2007	III	Y	
G7K100236	002	C163-1	Soil	11/9/2007	III	Y[(a)]	Y
G7K100236	003	C163-3	Soil	11/9/2007	III	Y	Y
G7K100236	004	C163-5	Soil	11/9/2007	III	Y	Y
G7K100236	005	C163-7	Soil	11/9/2007	III	Y	Y
G7K100236	006	C163-10	Soil	11/9/2007	III	Y	Y
G7K100236	007	C162-1	Soil	11/9/2007	III	Y	Y
G7K100236	008	C162-3	Soil	11/9/2007	III	Y	Y
G7K100236	009	C162-5	Soil	11/9/2007	III	Y[(b)]	Y[(b)]
G7K100236	010	C162-105	Field Duplicate Soil	11/9/2007	III	Y[(b)]	Y[(b)]
G7K100236	011	C162-7	Soil	11/9/2007	III	Y	Y
G7K100236	012	C162-10	Soil	11/9/2007	III	Y	Y
G7K100236	013	IDW-SOIL	Waste Soil	11/9/2007	III	Y	Y
G7K100236	014	IDW-WATER	Waste Water	11/9/2007	III	Y	
G8C150141	001	C182-1	Soil	3/13/2008	III	Y	Y
G8C150141	002	C182-3	Soil	3/13/2008	III	Y	Y
G8C150141	003	C181-15	Soil	3/13/2008	III	Y	Y
G8C150141	004	C184-1	Soil	3/13/2008	III	Y	Y
G8C150141	005	C184-3	Soil	3/13/2008	III	Y	Y
G8C150141	006	C183-1	Soil	3/13/2008	III	Y[(a)]	Y
G8C150141	007	C183-3	Soil	3/13/2008	III	Y	Y
G8C150141	008	C186-1	Soil	3/13/2008	III	Y	Y
G8C150141	009	C186-3	Soil	3/13/2008	III	Y	Y
G8C150141	010	C180-1	Soil	3/13/2008	III	Y	Y
G8C150141	011	C180-3	Soil	3/13/2008	III	Y	Y
G8C150141	012	C185-1	Soil	3/13/2008	III	Y	Y
G8C150141	013	C185-3	Soil	3/13/2008	III	Y	Y
G8C150141	014	C178-1	Soil	3/13/2008	III	Y	Y

Table 8
November 2007 and March 2008 Analytical Sample Summary
JCI Property Supplemental Soil Investigation

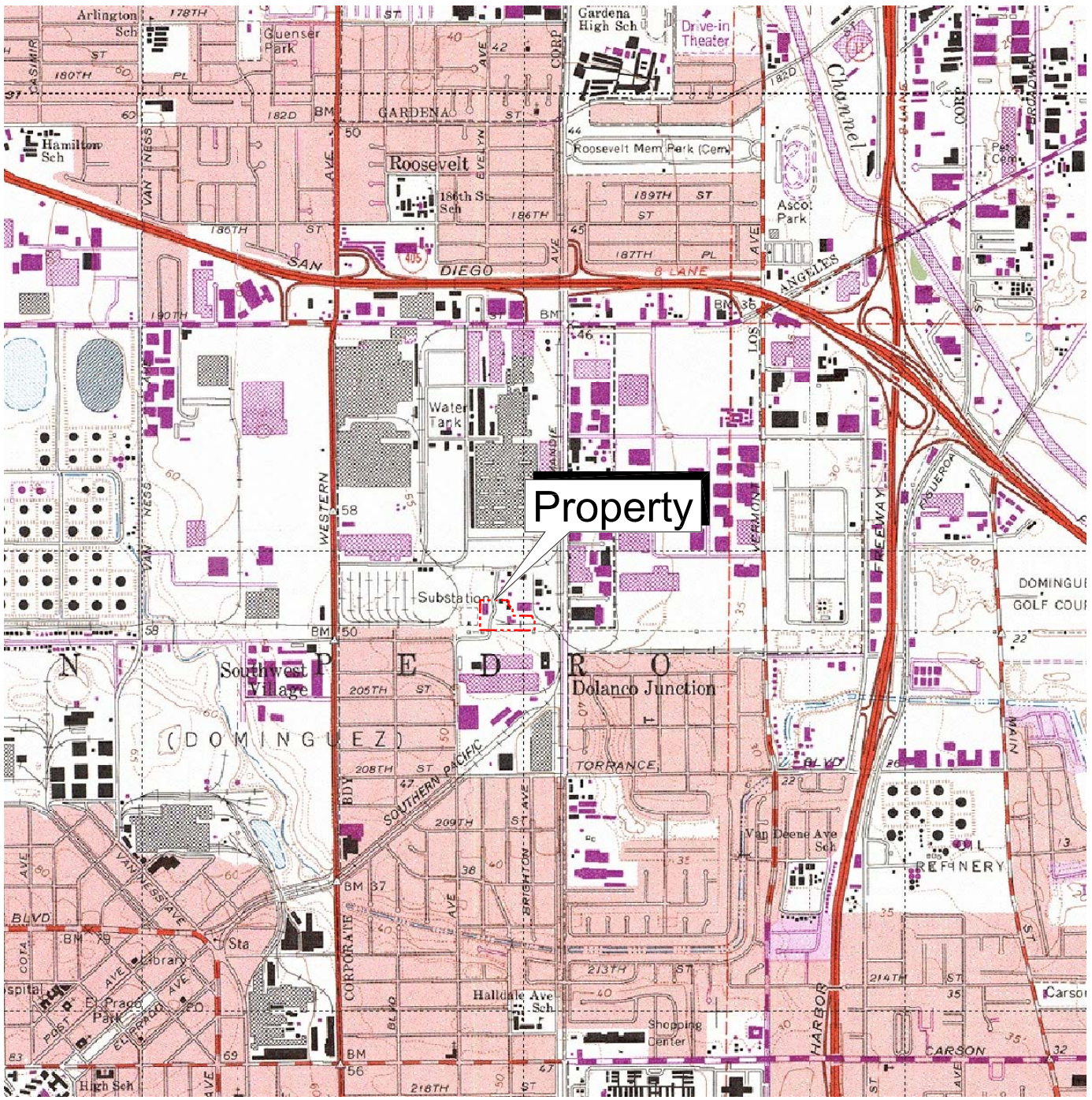
SDG	Lab ID	Field Sample ID	Matrix/ Sample Type	Date Sampled	Level of Validation	SW8081A	D2216
G8C150141	015	EB031308	Equipment Blank	3/13/2008	III	Y	
G8C150141	016	C181-20	Soil	3/13/2008	III	Y[(b)]	Y[(b)]
G8C150141	017	C181-120	Field Duplicate Soil	3/13/2008	III	Y[(b)]	Y[(b)]
G8C150141	018	C178-3	Soil	3/13/2008	III	Y[(b)]	Y[(b)]
G8C150141	019	C178-103	Field Duplicate Soil	3/13/2008	III	Y[(b)]	Y[(b)]
G8C150141	020	C179-1	Soil	3/13/2008	III	Y	Y
G8C150141	021	C179-3	Soil	3/13/2008	III	Y	Y[(a)]

[(a)] Matrix spike/matrix spike duplicate (MS/MSD) for SW8081A or laboratory duplicate analysis for D2216 performed on this sample.
[(b)] Field duplicate sample pair.

Analytical Parameters by Method (Y = Yes, analysis by this method was requested and performed):

SW8081A = Organochlorine Pesticides by Gas Chromatography (GC)
D2216 = Soil Moisture Content

FIGURES



NORTH

0 1,000 2,000 FEET

SCALE: 1"= 2,000'

Reference:

1. U.S.G.S. Topographic Map, Torrance, California 7.5 Minute Quadrangle. Georeferenced using the State of California's CASIL Online GIS Database, Copyright 2009.

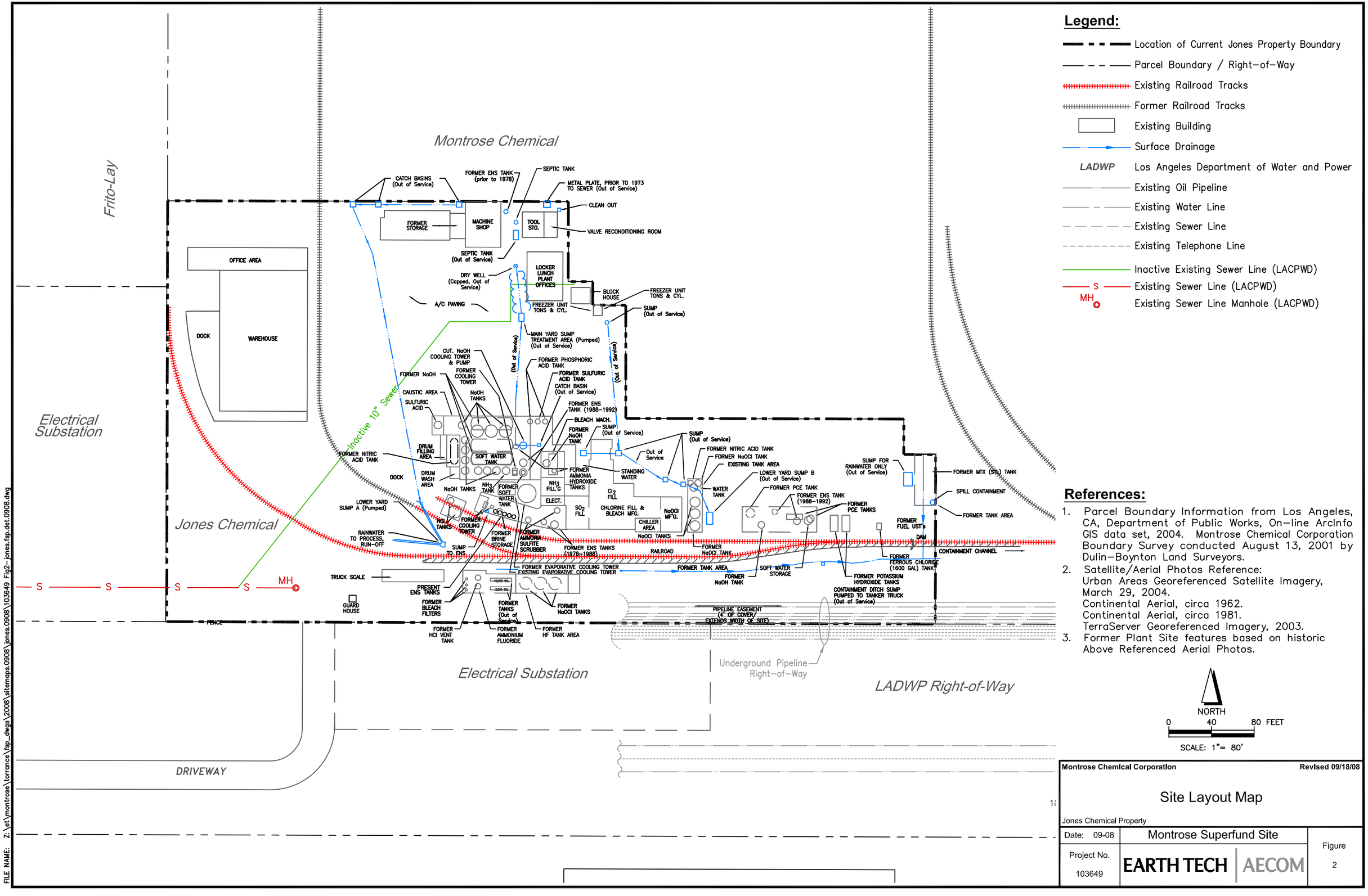
Montrose Chemical Corporation — Revised 03/31/09

Site Location Map

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	1

FILE NAME: Z:\ET\MONTROSE\TORRANCE\SLM\2009\SLM.0309\103649 FIG1-JCI-SLM.033109.DWG



Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Existing Oil Pipeline
- Existing Water Line
- Existing Sewer Line
- Existing Telephone Line
- Inactive Existing Sewer Line (LACPWD)
- S — Existing Sewer Line (LACPWD)
- MH — Existing Sewer Line Manhole (LACPWD)

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

NORTH

0 40 80 FEET

SCALE: 1"= 80'

Montrose Chemical Corporation — **Revised 09/18/08**

Site Layout Map

Jones Chemical Property

Date: 09-08	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	2

FILE NAME: Z:\et\montrose\torrance\fsp_dwgs\2008\sitemaps.0908\jones.0908\103649 Fig2- jones fsp det.0908.dwg

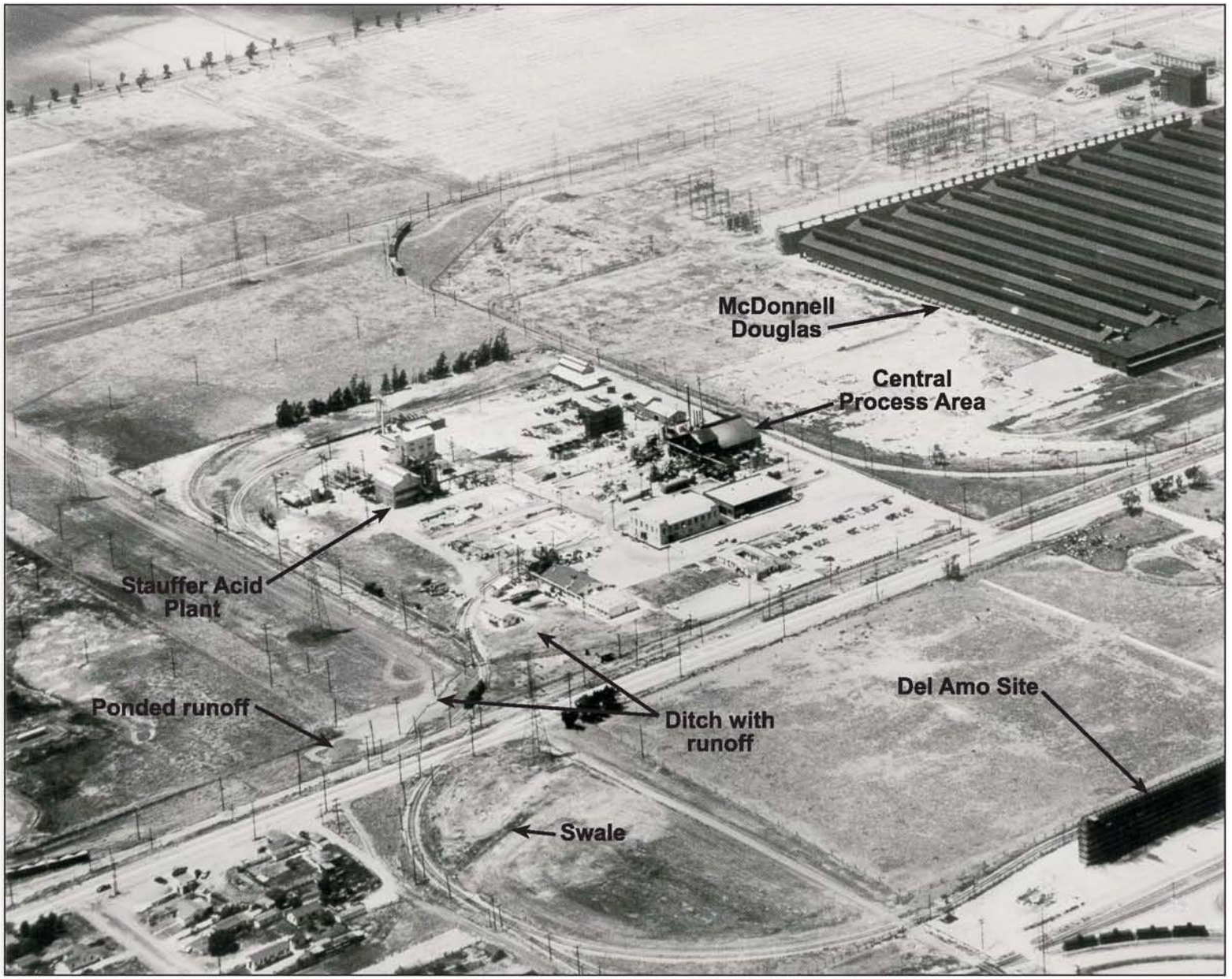


Figure 3
Montrose Property - 1952
Montrose Chemical Corporation of California

Source: PAI/UCSB, Photo No. N-2030, May 10, 1952

CH2MHILL

E042002301SCO175845.FI.01 mont52e fh 6/04

References:

1. Satellite/Aerial Photo Provided by CH2MHILL

NORTH
0 150 300 FEET
SCALE: 1"= 300'

Montrose Chemical Corporation — Revised 09/18/08

Site Vicinity Map

Jones Chemical Property

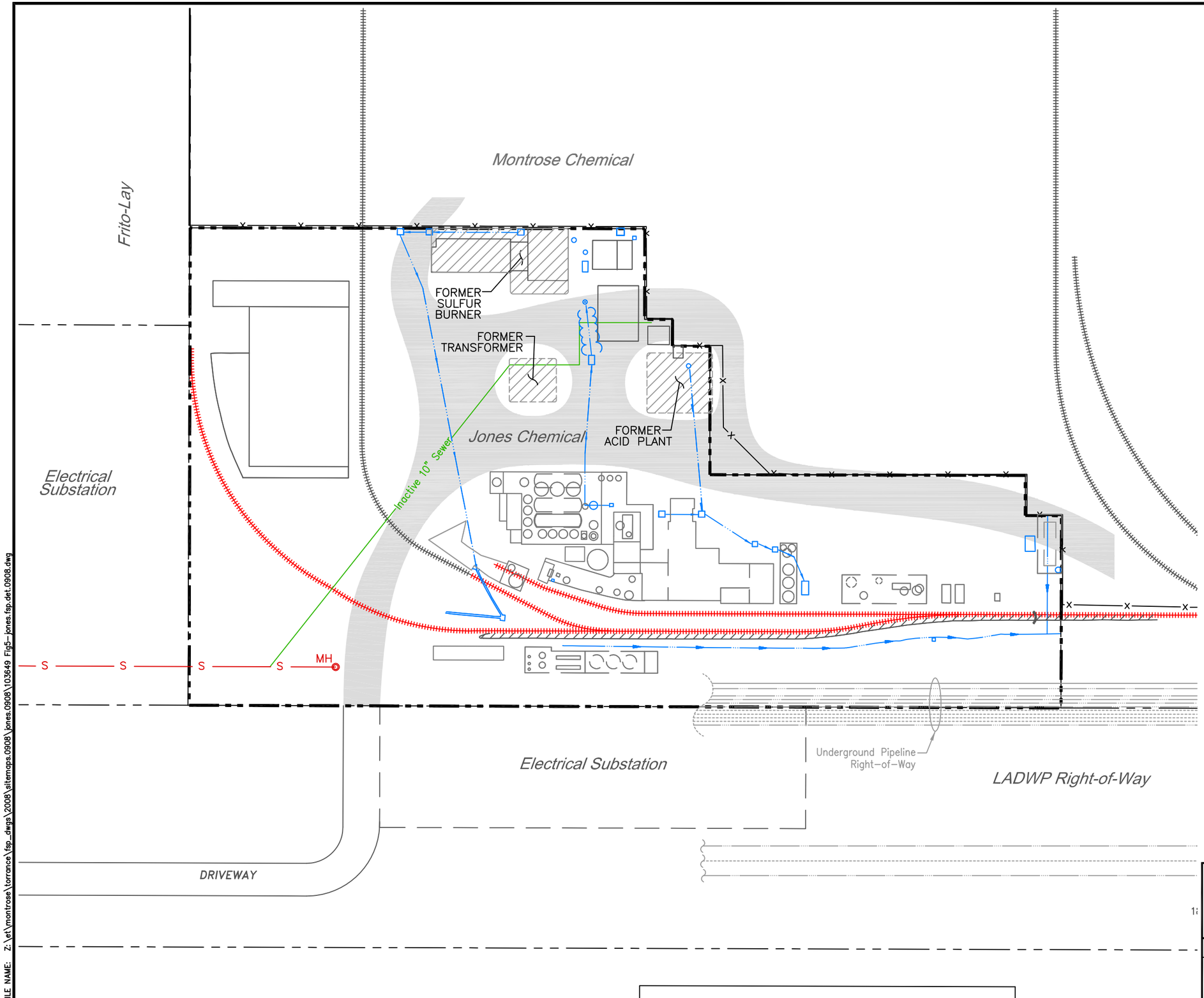
Date: 09-08

Project No. 103649

EARTH TECH | AECOM

Figure 4

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2008\SITEMAPS.0908\JONES.0908\103649 FIG4-JONES.FSP.DET.0908.DWG



Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Existing Oil Pipeline
- Existing Water Line
- Existing Sewer Line
- Existing Telephone Line
- Former Truck Traffic Routes based on Oblique Aerial from EPA, est. circa 1965–1970
- S — Inactive Existing Sewer Line (LACPWD)
- S — Existing Sewer Line
- MH — Existing Sewer Line Manhole (LACPWD)

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

NORTH

0 40 80 FEET

SCALE: 1"= 80'

Montrose Chemical Corporation — Revised 09/18//08

Historical Site Features

Jones Chemical Property

Date: 09-08	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	5

FILE NAME: Z:\et\montrose\torrance\fsp_dwgs\2008\sitemaps.0908\jones.0908\103649 Fig5-jones.fsp.det.0908.dwg

Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Soil Boring Sampled in May 1981 By Montrose, Jones Chemical, and DHS. (ref: EPA 1998b)
- Soil Boring Sampled During 1985 to 1988 by Hargis + Associates, inc.
- Soil Boring Sampled in March 1995 by Levine Fricke inc.

Montrose Chemical

Frito-Lay

Jones Chemical

Electrical Substation

Electrical Substation

LADWP Right-of-Way

DRIVEWAY

Underground Pipeline Right-of-Way

JC005 JC004 JC003 JC002 JC001

LF-1 LF-2 LF-3 LF-4 LF-5 LF-6 LF-7 LF-8 LF-9 LF-10 LF-11 LF-12 LF-13 LF-14 LF-15 LF-16 LF-17 LF-18 LF-19 LF-20 LF-21 LF-22 LF-23 LF-24 LF-25 LF-26 LF-27 LF-28 LF-29 LF-30 LF-31 LF-32 LF-33 LF-34 LF-35 LF-36 LF-37 LF-38 LF-39 LF-40 LF-41 LF-42 LF-43 LF-44 LF-45 LF-46 LF-46 LF-48 LF-49 LF-50 LF-51 LF-52 LF-53 LF-54 LF-55 LF-56 LF-57 LF-58 LF-59 LF-60 LF-61 LF-62 LF-63 LF-64 LF-65 LF-66 LF-67 LF-68 LF-69 LF-70 LF-71 LF-72 LF-73 LF-74 LF-75 LF-76 LF-77

15

13

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

NORTH

0 40 80 FEET

SCALE: 1"= 80'

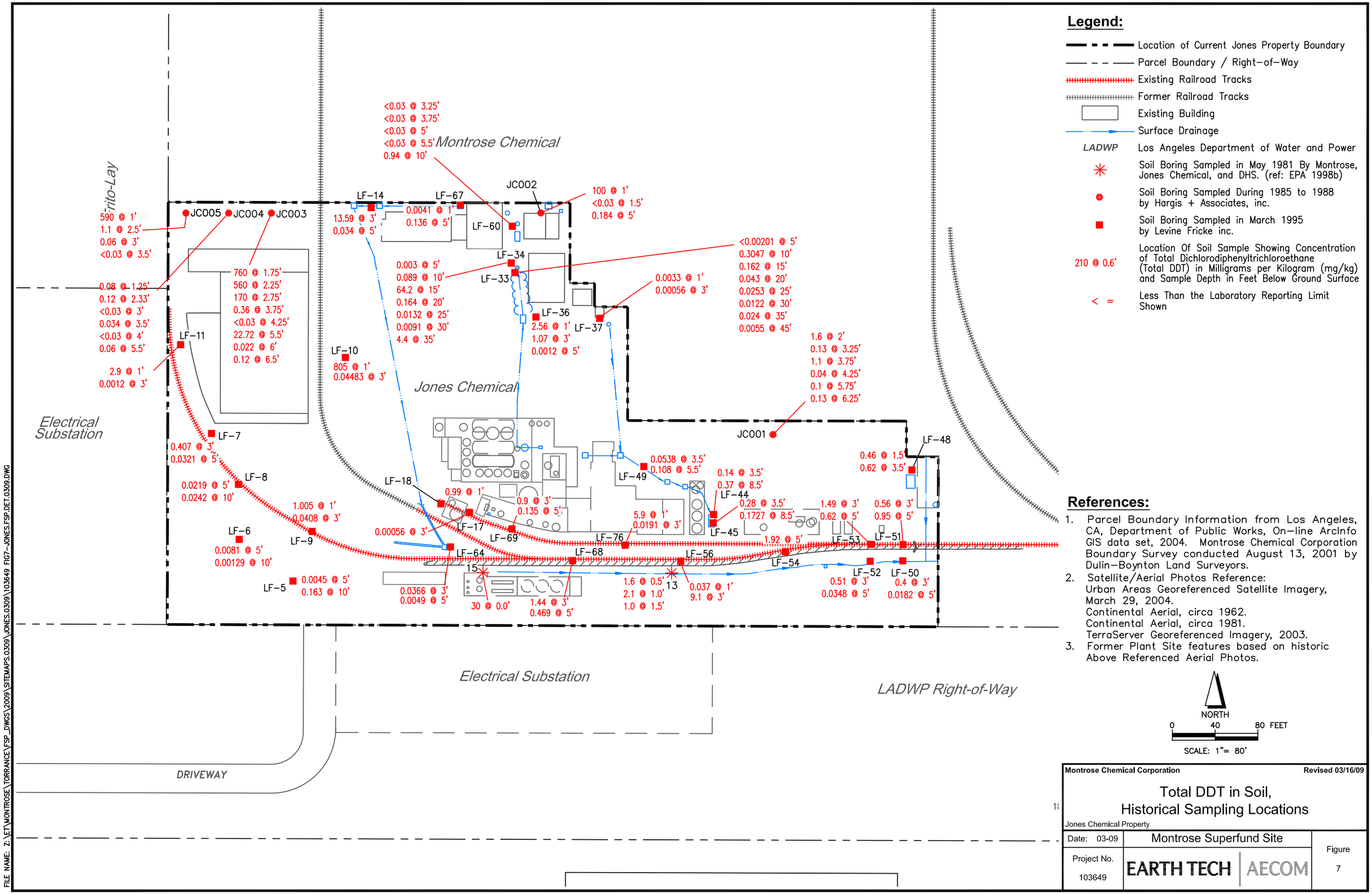
Montrose Chemical Corporation — Revised 03/16/09

Historical Boring Locations

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	6

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG6--JONES.FSP.DET.0309.DWG



References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

NORTH

0 40 80 FEET

SCALE: 1"= 80'

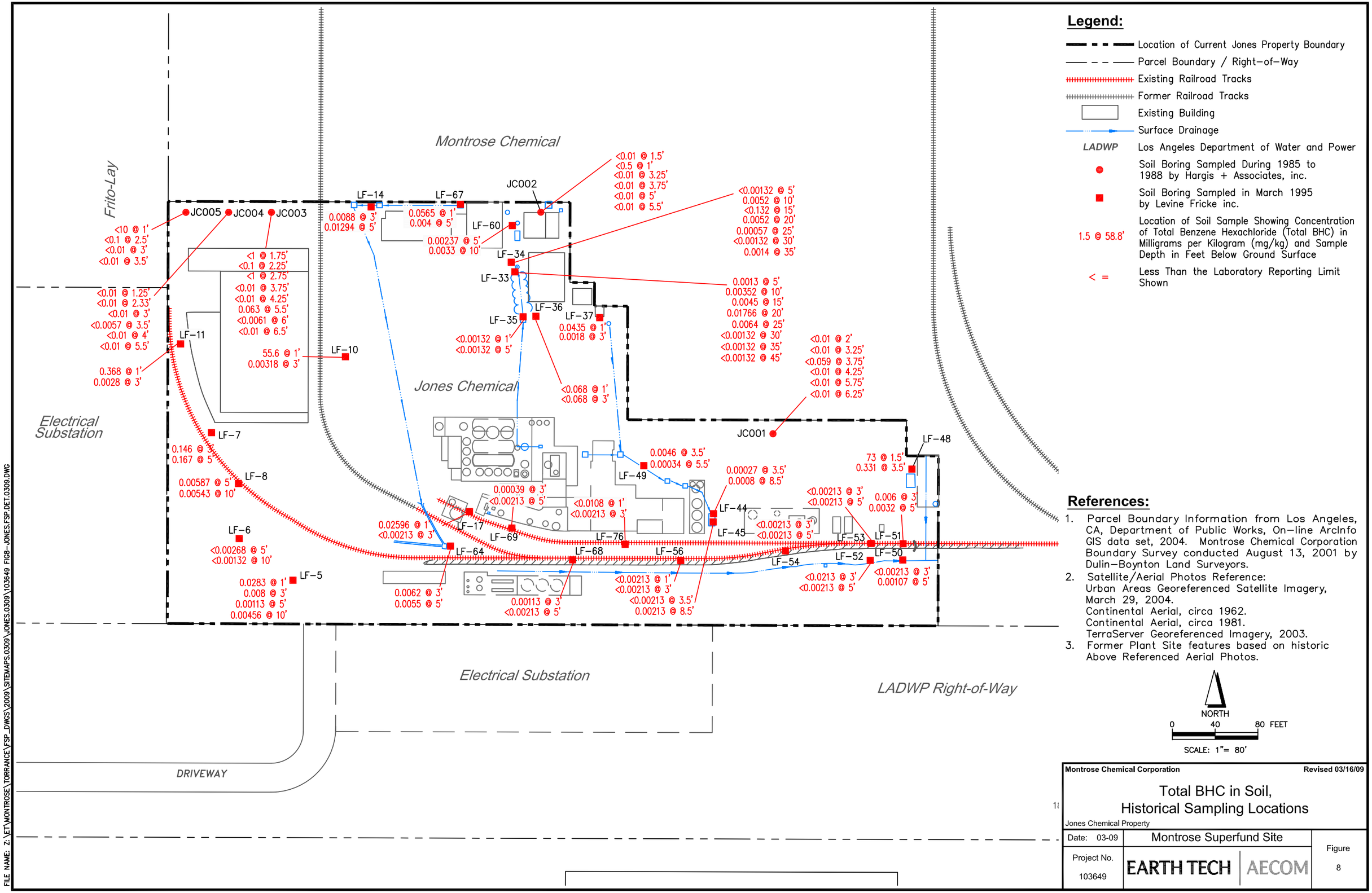
Montrose Chemical Corporation — Revised 03/16/09

Total DDT in Soil, Historical Sampling Locations

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	7

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG7-JONES.FSP.DET.0309.DWG



Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Soil Boring Sampled During 1985 to 1988 by Hargis + Associates, inc.
- Soil Boring Sampled in March 1995 by Levine Fricke inc.
- 1.5 @ 58.8' — Location of Soil Sample Showing Concentration of Total Benzene Hexachloride (Total BHC) in Milligrams per Kilogram (mg/kg) and Sample Depth in Feet Below Ground Surface
- < = Less Than the Laboratory Reporting Limit Shown

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

NORTH

0 40 80 FEET

SCALE: 1"= 80'

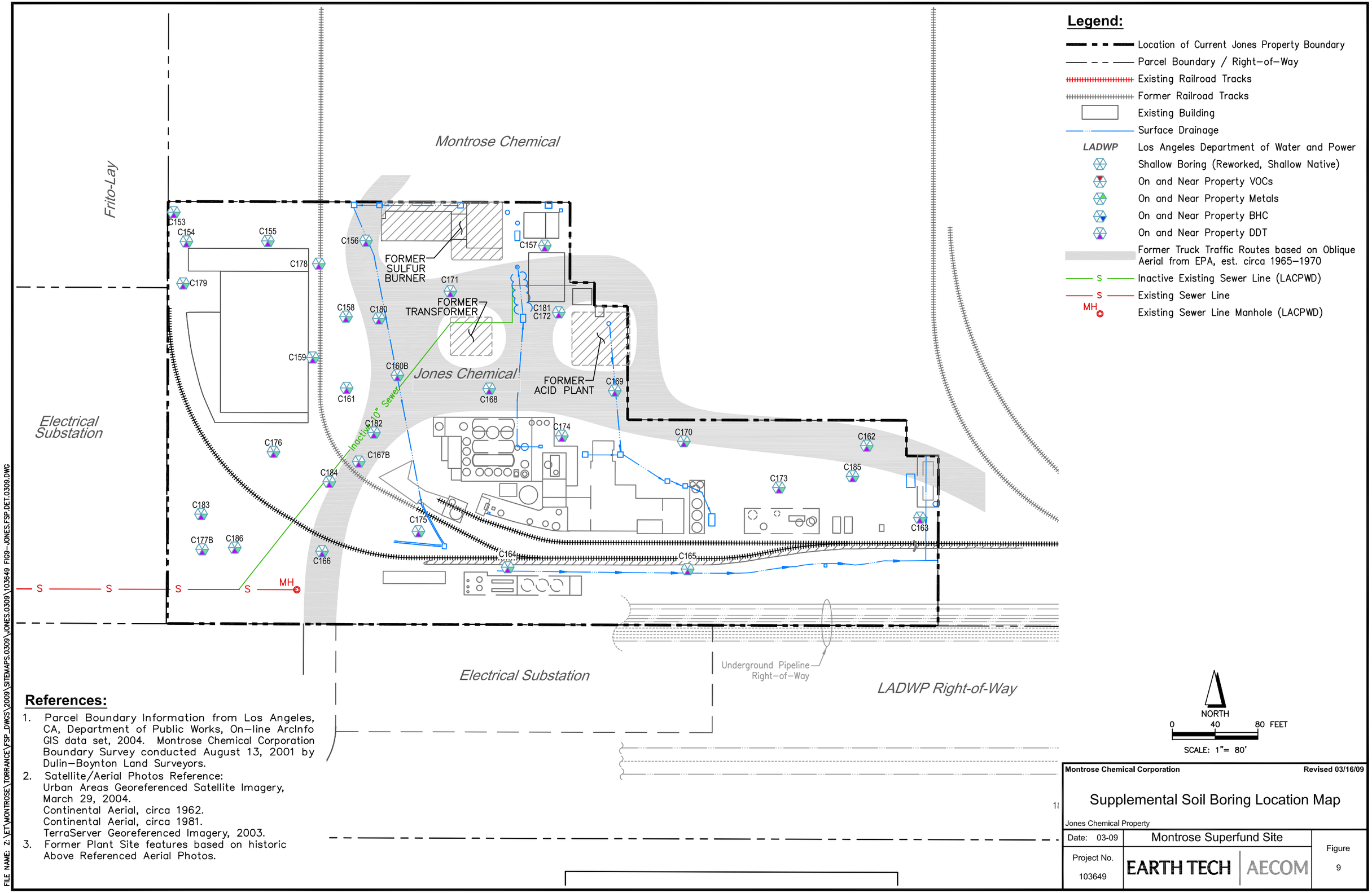
Montrose Chemical Corporation — **Revised 03/16/09**

Total BHC in Soil, Historical Sampling Locations

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	8

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG8-JONES.FSP.DET.0309.DWG



References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

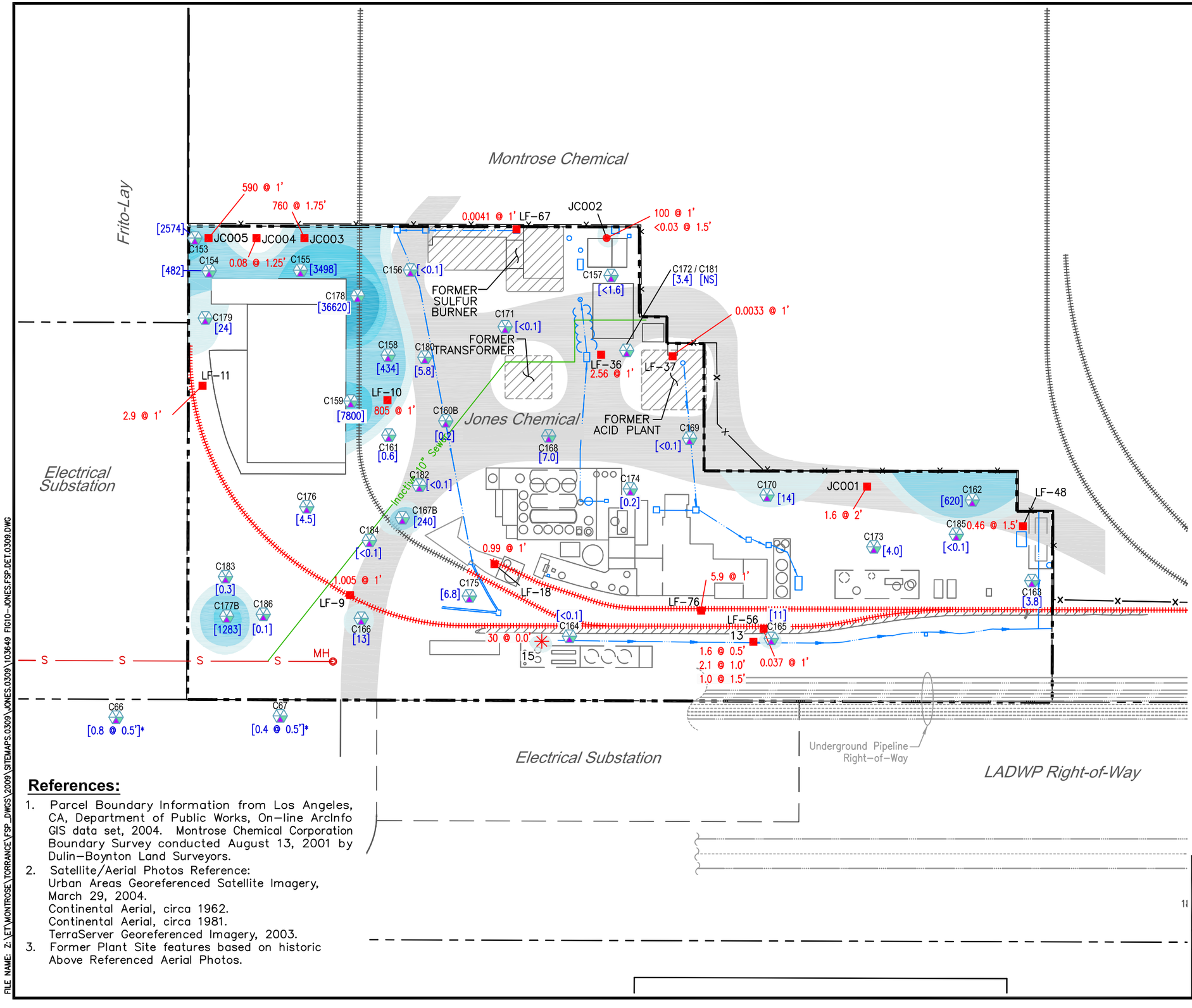
Montrose Chemical Corporation — **Revised 03/16/09**

Supplemental Soil Boring Location Map

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	9

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG9-JONES.FSP.DET.0309.DWG



Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Shallow Boring (Reworked, Shallow Native)
- On and Near Property VOCs
- On and Near Property Metals
- On and Near Property BHC
- On and Near Property DDT
- Soil Boring Sampled in May 1981 By Montrose, Jones Chemical, and DHS. (ref: EPA 1998b)
- Soil Boring Sampled During 1985 to 1988 by Hargis + Associates, inc.
- Soil Boring Sampled in March 1995 by Levine Fricke inc.
- Former Truck Traffic Routes based on Oblique Aerial from EPA, est. circa 1965–1970
- [434] — Soil Sample Location Showing Concentration of Total Dichlorodiphenyltrichloroethane from 11/07 and 3/08 (Total DDT) in Milligrams per Kilogram (mg/kg) at Sample Depth 1 Foot Below Ground Surface
- * — 2005 Montrose Supplemental Soil Investigation
- [NS] — Not Sampled
- 760 @ 1.75' — Soil Sample Location Showing Historical Concentration of Total DDT and Sample Depth in Feet Below Ground Surface
- S — Inactive Existing Sewer Line (LACPWD)
- S — Existing Sewer Line (LACPWD)
- MH — Existing Sewer Line Manhole (LACPWD)
- DDT Isoconcentration in Soil Contour Interval 10–100 mg/kg
- DDT Isoconcentration in Soil Contour Interval 100–1,000 mg/kg
- DDT Isoconcentration in Soil Contour Interval 1,000–10,000 mg/kg
- DDT Isoconcentration in Soil Contour Interval 10,000–100,000 mg/kg
- < = — Less Than the Laboratory Reporting Limit Shown

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

NORTH

0 40 80 FEET

SCALE: 1"= 80'

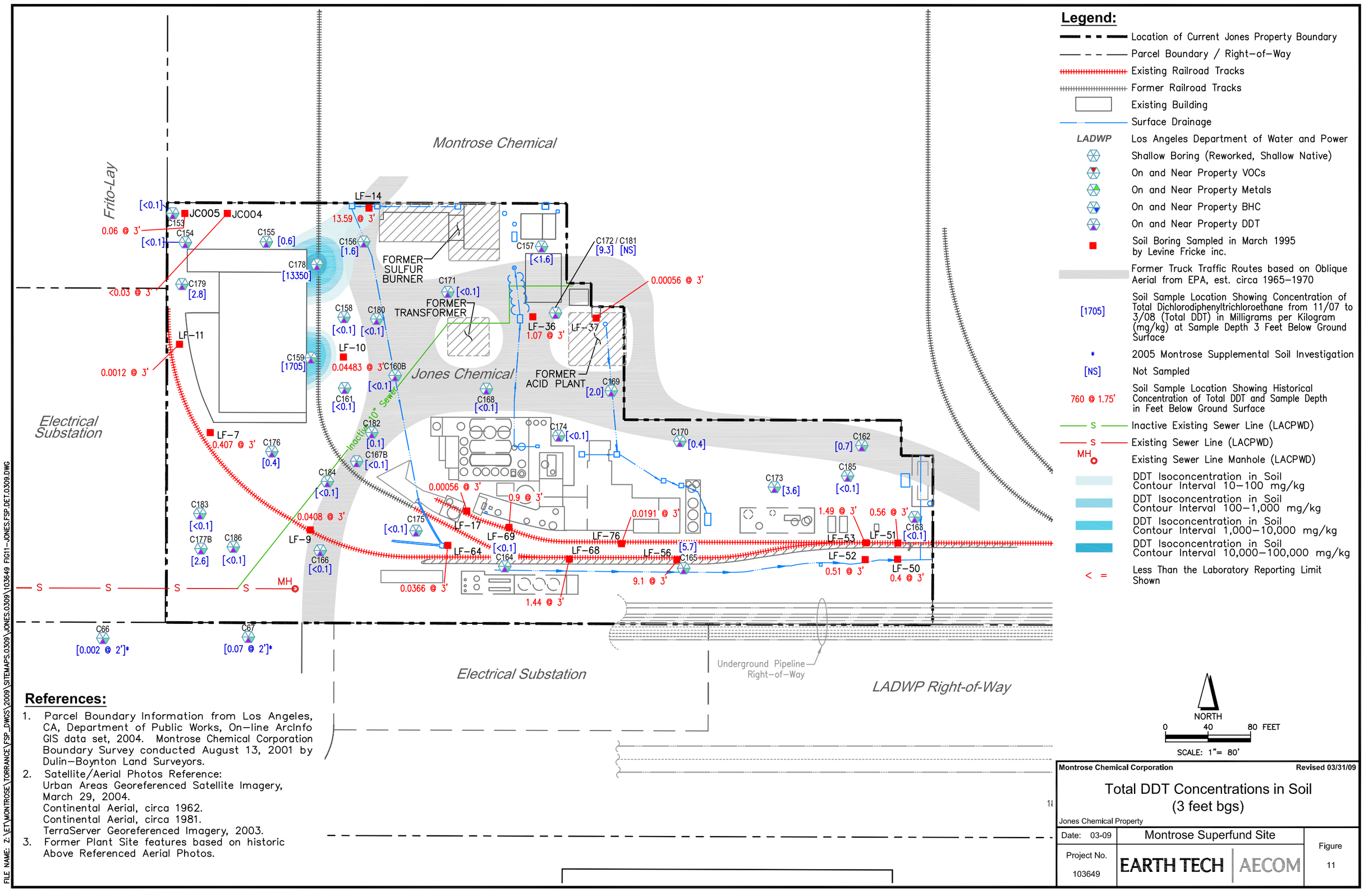
Montrose Chemical Corporation — Revised 03/31/09

Total DDT Concentrations in Soil (1 foot bgs)

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	10

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG10-JONES.FSP.DET.0309.DWG



References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Shallow Boring (Reworked, Shallow Native)
- On and Near Property VOCs
- On and Near Property Metals
- On and Near Property BHC
- On and Near Property DDT
- Soil Boring Sampled in March 1995 by Levine Fricke inc.
- Former Truck Traffic Routes based on Oblique Aerial from EPA, est. circa 1965-1970
- [1705] — Soil Sample Location Showing Concentration of Total Dichlorodiphenyltrichloroethane from 11/07 to 3/08 (Total DDT) in Milligrams per Kilogram (mg/kg) at Sample Depth 3 Feet Below Ground Surface
- * — 2005 Montrose Supplemental Soil Investigation
- [NS] — Not Sampled
- 760 @ 1.75' — Soil Sample Location Showing Historical Concentration of Total DDT and Sample Depth in Feet Below Ground Surface
- S — Inactive Existing Sewer Line (LACPWD)
- S — Existing Sewer Line (LACPWD)
- MH — Existing Sewer Line Manhole (LACPWD)
- DDT Isoconcentration in Soil Contour Interval 10-100 mg/kg
- DDT Isoconcentration in Soil Contour Interval 100-1,000 mg/kg
- DDT Isoconcentration in Soil Contour Interval 1,000-10,000 mg/kg
- DDT Isoconcentration in Soil Contour Interval 10,000-100,000 mg/kg
- < = — Less Than the Laboratory Reporting Limit Shown

NORTH

0 40 80 FEET

SCALE: 1"= 80'

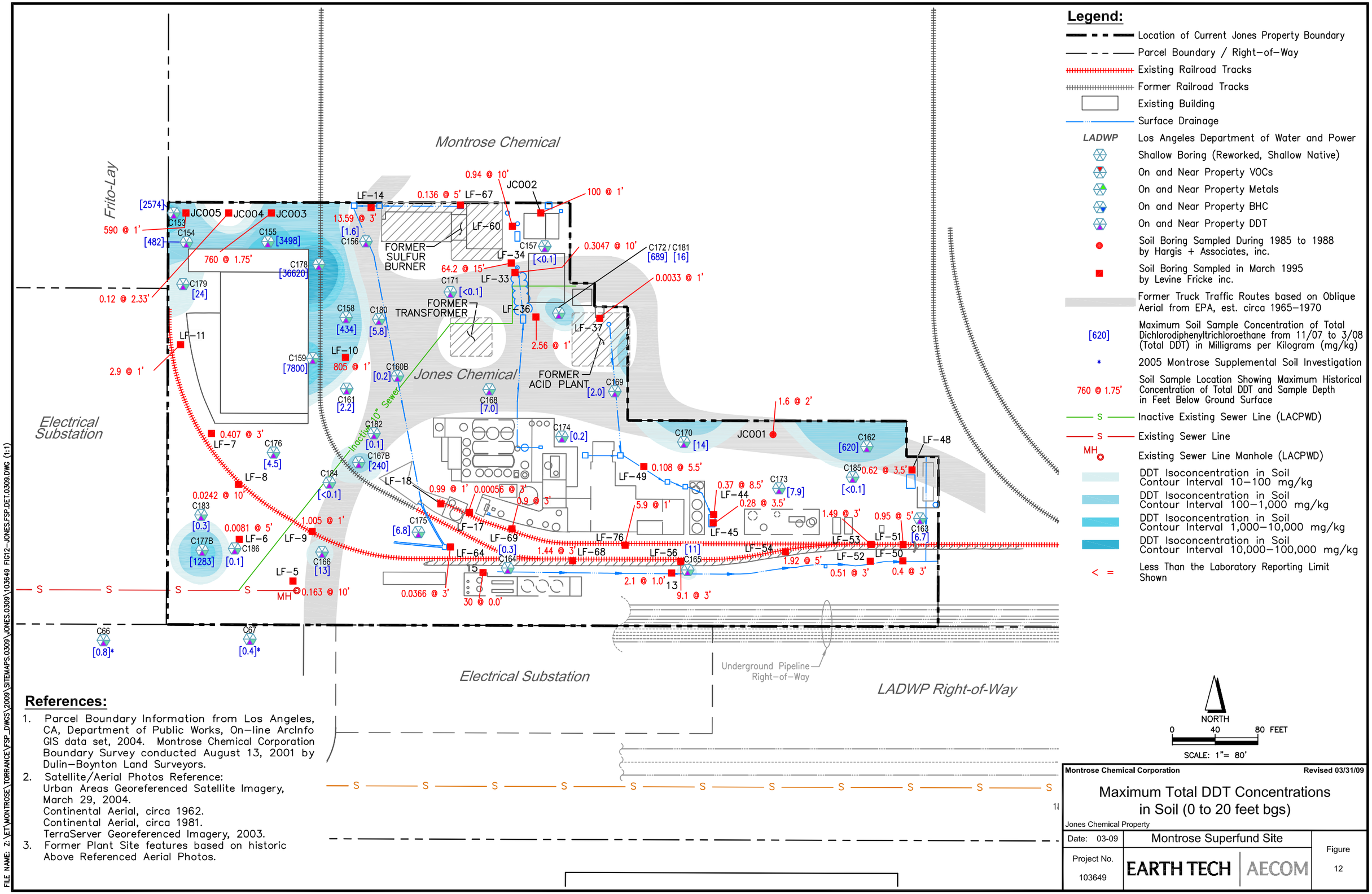
Montrose Chemical Corporation — **Revised 03/31/09**

Total DDT Concentrations in Soil (3 feet bgs)

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	11

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG11-JONES.FSP.DET.0309.DWG



Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Shallow Boring (Reworked, Shallow Native)
- On and Near Property VOCs
- On and Near Property Metals
- On and Near Property BHC
- On and Near Property DDT
- Soil Boring Sampled During 1985 to 1988 by Hargis + Associates, inc.
- Soil Boring Sampled in March 1995 by Levine Fricke inc.
- Former Truck Traffic Routes based on Oblique Aerial from EPA, est. circa 1965–1970
- [620] — Maximum Soil Sample Concentration of Total Dichlorodiphenyltrichloroethane from 11/07 to 3/08 (Total DDT) in Milligrams per Kilogram (mg/kg)
- * — 2005 Montrose Supplemental Soil Investigation
- 760 @ 1.75' — Soil Sample Location Showing Maximum Historical Concentration of Total DDT and Sample Depth in Feet Below Ground Surface
- S — Inactive Existing Sewer Line (LACPWD)
- S — Existing Sewer Line
- MH — Existing Sewer Line Manhole (LACPWD)
- DDT Isoconcentration in Soil Contour Interval 10–100 mg/kg
- DDT Isoconcentration in Soil Contour Interval 100–1,000 mg/kg
- DDT Isoconcentration in Soil Contour Interval 1,000–10,000 mg/kg
- DDT Isoconcentration in Soil Contour Interval 10,000–100,000 mg/kg
- < = — Less Than the Laboratory Reporting Limit Shown

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

NORTH
0 40 80 FEET
SCALE: 1"= 80'

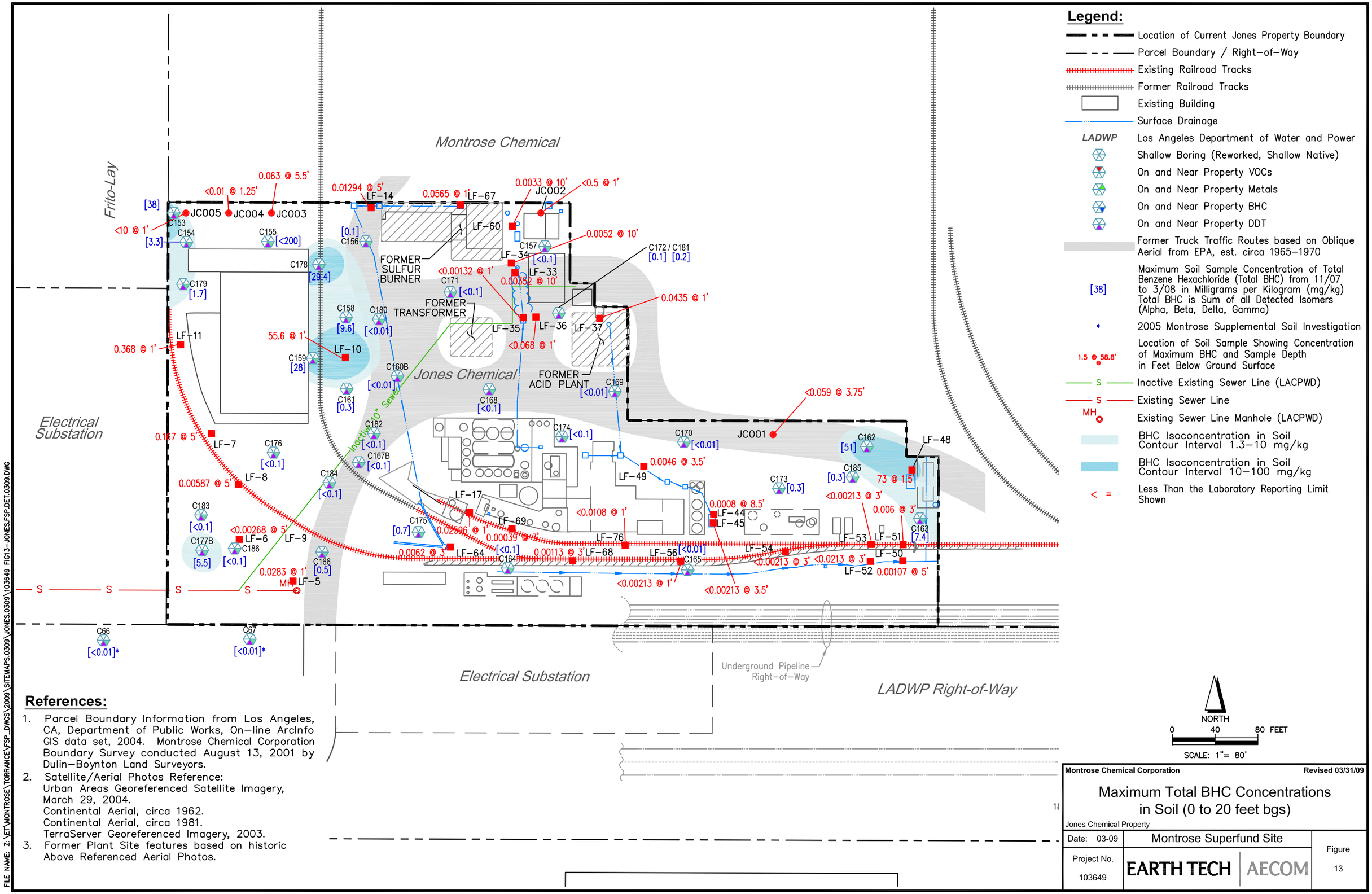
Montrose Chemical Corporation — Revised 03/31/09

Maximum Total DDT Concentrations in Soil (0 to 20 feet bgs)

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	12

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG12-JONES.FSP.DET.0309.DWG (1:1)



Legend:

- Location of Current Jones Property Boundary
- Parcel Boundary / Right-of-Way
- Existing Railroad Tracks
- Former Railroad Tracks
- Existing Building
- Surface Drainage
- LADWP — Los Angeles Department of Water and Power
- Shallow Boring (Reworked, Shallow Native)
- On and Near Property VOCs
- On and Near Property Metals
- On and Near Property BHC
- On and Near Property DDT
- Former Truck Traffic Routes based on Oblique Aerial from EPA, est. circa 1965–1970
- [38] — Maximum Soil Sample Concentration of Total Benzene Hexachloride (Total BHC) from 11/07 to 3/08 in Milligrams per Kilogram (mg/kg) Total BHC is Sum of all Detected Isomers (Alpha, Beta, Delta, Gamma)
- * — 2005 Montrose Supplemental Soil Investigation
- 1.5 @ 58.8' — Location of Soil Sample Showing Concentration of Maximum BHC and Sample Depth in Feet Below Ground Surface
- S — Inactive Existing Sewer Line (LACPWD)
- S — Existing Sewer Line
- MH — Existing Sewer Line Manhole (LACPWD)
- BHC Isoconcentration in Soil Contour Interval 1.3–10 mg/kg
- BHC Isoconcentration in Soil Contour Interval 10–100 mg/kg
- < = — Less Than the Laboratory Reporting Limit Shown

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, On-line ArcInfo GIS data set, 2004. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin-Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference:
   Urban Areas Georeferenced Satellite Imagery, March 29, 2004.
   Continental Aerial, circa 1962.
   Continental Aerial, circa 1981.
   TerraServer Georeferenced Imagery, 2003.
3. Former Plant Site features based on historic Above Referenced Aerial Photos.

Montrose Chemical Corporation — **Revised 03/31/09**

Maximum Total BHC Concentrations in Soil (0 to 20 feet bgs)

Jones Chemical Property

Date: 03-09	Montrose Superfund Site	Figure
Project No. 103649	EARTH TECH | AECOM	13

FILE NAME: Z:\ET\MONTROSE\TORRANCE\FSP_DWGS\2009\SITEMAPS.0309\JONES.0309\103649 FIG13-JONES.FSP.DET.0309.DWG