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South Valley and Ridge Area
Non-Ordnance and Explosives Remediation Report
Tourtelot Cleanup Project
Benicia, California

March 22, 2004

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California Environmental Protection Agency
Department of Toxic Substances Control
Sacramento, California

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March 22, 2004

Rizgar Ghazi
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Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826

Subject: South Valley and Ridge Area Non-OE Remediation Report, Tourtelot Cleanup Project, Benicia, California

Dear Mr.Ghazi:

Enclosed are three copies of the South Valley and Ridge Area Non-OE Remediation Report, prepared by Northgate Environmental Management, Inc ("Northgate") and Exponent. This report has been prepared on behalf of Pacific Bay Homes to describe remediation in the South Valley and Ridge Area of the Tourtelot Project Site. The remediation work has been performed in substantial conformance with the requirements of the Remedial Action Plan (Earth Tech, 2002a) and the Final Non-Ordnance and Explosives Remedial Design Document (Northgate, 2002).

If you have any questions regarding the enclosed report, please contact the undersigned.

Sincerely,

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BIP	blow-in-place
BTAG	Biological Technical Assistance Group
Cal EPA	California Environmental Protection Agency
CAM	California Administrative Manual
CFR	Code of Federal Regulations
DNT	2,4-dinitrotoluene
DOD	Department of Defense
DOE	Department of Energy
DTSC	Department of Toxic Substances Control
ECR	Excess Cancer Risk
FSLP	Field Sampling and Laboratory Analysis Plan
HI	Hazard Index
HSDB	Hazardous Substances Databank
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Contingency Plan
Non-OE	non-ordnance and explosives
Northgate	Northgate Environmental Management, Inc.
OE	ordnance and explosives
PAH	polynuclear aromatic hydrocarbon
pg/g	picograms per gram
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RAP	Remedial Action Plan
RI/FS	Remedial Investigation/Feasibility Study
RDD	Remedial Design Document
SCM	site conceptual model
SF	slope factor
TCDD	tetrachlorodibenzo-p-dioxin
TEPH	total extractable petroleum hydrocarbons
TNT	trinitrotoluene
TRV	toxicity reference value
USACE	U.S. Army Corps of Engineers
US EPA	United States Environmental Protection Agency
UCL	upper confidence limit
UTL	upper tolerance limit

1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This report has been prepared on behalf of Pacific Bay Homes by Northgate Environmental Management, Inc. ("Northgate") and Exponent to describe non-ordnance and explosive (Non-OE) remedial work completed from February 2002 through February 2004 at the Tourtelot Project Site ("Project Site") in the Ridge Area and South Valley. The Project Site is located in the City of Benicia, Solano County, California (Figure 1-1). Pacific Bay Homes acquired ownership in 2003 of the majority of the Project Site and has agreed with Granite Management Corporation and FN Projects to complete the project. For purposes of this report, these entities are collectively referred to as "Pacific Bay Homes."

Non-OE work at the Project Site is being performed in accordance with the Final Non-Ordnance and Explosives Remedial Design Document (Non-OE RDD; Northgate, 2002). The Non-OE RDD describes the technical and operational plans for remediating chemically affected soils in accordance with the Remedial Investigation/Feasibility Study (RI/FS; Earth Tech, 2001) and Remedial Action Plan (RAP; Earth Tech 2002a). The RI/FS describes soil, surface water, and groundwater sampling and analysis activities and OE investigations at the Project Site. The RI/FS report develops and evaluates alternatives for the remediation of both OE and chemically affected soil at the site. The RI/FS recommends that Alternative 5A be implemented at the Project Site. The California Environmental Protection Agency Department of Toxic Substance Control (DTSC) reviewed the RI/FS and concurred that this alternative meets remedial criteria as defined in the National Hazardous Oil and Hazardous Substances Contingency Plan (NCP 40 CFR 300.430). Major components of the OE cleanup under Alternative 5A of the RAP include OE point clearance, installation of a crushed bedrock layer in the planned residential areas, and monitoring. The plan for remediation of OE and OE scrap is addressed in a separate companion document, the Final Tourtelot Project Site Ordnance and Explosives Remedial Design Document (OE RDD; Earth Tech, 2002b).

The Project Site is situated in rolling hillside topography, including two valleys referred to as the "North Valley" and the "South Valley," which are separated by the "Ridge Area." The results of investigations and remedial activities in the North Valley were previously reported in the North Valley Non-Ordnance and Explosives Remediation Report (Northgate 2003a) and the TNT Strips Ordnance and Explosives and Non-Ordnance and Explosives Remediation Report (Northgate 2003c). The results of investigations in other areas of the Project Site that did not require remediation were reported in the Non-Ordnance and Explosives Investigation Areas Report (Northgate 2003b).

This report addresses the Flare Sites 1 and 3 and Demolition Sites 1 and 3, located in the South Valley, and Flare Site 2 and former Remediation Stockpiles, located in the Ridge Area. The

remainder of Section 1.0 describes these areas, future land use, remedial goals and actions, and a summary of OE remedial activities. Results of remedial activities and confirmation sampling in the Ridge Area and South Valley are presented in Section 2.0 of this report. Section 3.0 presents a post-remediation risk assessment evaluating the residual chemical concentrations in these areas. Section 4.0 provides a summary and conclusions of this report.

1.2 DESCRIPTION OF SOUTH VALLEY AREAS

The South Valley Area discussed in this report includes Flare Sites 1 and 3 and Demolition Sites 1 and 3. These areas are located on the northern and southern slopes of the South Valley (Figure 1-2). Demolition Sites 1 and 3 and Flare Site 1 were identified in the RI/FS and Non-OE RDD as requiring remediation. Because of their close proximity to each other, these three areas are referred to collectively in this report as the "South Valley Remediation Area." Flare Site 3 was not identified in the RI/FS and Non-OE RDD, but was visually identified during point clearance of OE in the South Valley. Because Flare Site 3 is not in close proximity to the South Valley Remediation Area Flare and Demolition Sites, this area is not included in the "South Valley Remediation Area."

1.2.1 Flare Site 1

Flare Site 1 is located on the south side of the wetlands in the South Valley, and was visually evident by the presence of residual ash on the ground surface. The inspection of earliest available aerial photographs (1937) indicates that the site was situated over a landslide. This flare site was used to dispose of flares by burning them (Jacobs, 1999). This usually consisted of placing flares on the ground in piles and igniting them. Although no evidence of burning was visible in the aerial photographs, physical evidence of burning (i.e., residual ash) remained at Flare Site 1, as observed during site visits.

1.2.2 Flare Site 3

Flare Site 3 is situated at the bottom of the South Valley and includes a portion of the wetlands and an area north of the wetlands. Like Flare Site 2 (Section 1.3.1), Flare Site 3 was discovered during the point clearance of OE, after work at the site had commenced. It was visually evident by the presence of flare components and residue. Subsequent sampling confirmed these visual observations.

1.2.3 Demolition Site 1

Demolition Site 1 is situated on the south side of the wetlands, in a drainage swale near the bottom of the southern slope of the South Valley. The site is clearly visible in a number of the historical aerial photographs and first appears circa 1945, although no evidence of the type of use is evident on the photographs. No live ordnance items were recovered from this site during

investigations prior to remediation; however, during excavation operations, a burn kettle containing flare residue was located as well as numerous other types of OE energetic items.

1.2.4 Demolition Site 3

Demolition Site 3 is situated on the north side of the South Valley, where it coincides with a bench cut into the hillside. Demolition Site 3 is evident in the site-wide geophysical data and on the aerial photographs (since 1947). The surface of the bench appeared disturbed in several of the photographs. Four OE items were recovered from this site by Granite and USACE during the RI (Earth Tech 2001). The area surrounding Demolition Site 3 has been called the Mercury Impacted Area and is, herein, referred to as the "Demolition Site 3 Halo."

Locations where OE Energetic items were identified that required in-place disposal (i.e., the OE Energetic item was destroyed by detonation at the location where it was identified because it was determined to be unsafe to move) are referred to as blow-in-place (BIP) locations. During OE clearance activities, 10 BIPs were completed in Demolition Site 3 and the Demolition Site 3 Halo. BIP soils were removed during remediation of this area and stockpiled on the Ridge with Demolition Site 3 soils as reported in a technical memorandum dated September 25, 2003, 2003 and submitted to the DTSC and the RWQCB (see Attachment B-4 in Appendix B).

1.3 DESCRIPTION OF RIDGE AREAS

The Ridge Area discussed in this report includes Flare Site 2 and the former Remediation Stockpiles. The approximate boundaries of these areas are shown on Figure 1-2. Additional samples previously collected from the Ridge Area by Earth Tech and other Ridge Area samples collected by Northgate that are used in the risk assessment (Section 3.0) are also identified on Figure 1-2.

1.3.1 Flare Site 2

Flare Site 2 is located on the central portion of the Ridge Area. Flare Site 2 was visually identified as being a flare site during point clearance of OE in the Ridge Area, by the presence of flare components and residual ash on the ground surface. Subsequent sampling confirmed the visual observations.

1.3.2 Former Remediation Stockpiles

The former Remediation Stockpiles were located in the western and central portions of the Ridge Area. The former Remediation Stockpiles consisted of soil generated from the remediation of the Flare and Demolition Sites; BIP locations; former North Valley Stockpiles; and Areas 1 and 2 in the North Valley. Soil from these areas was stockpiled in the Ridge Area for OE clearance. As discussed in Section 2.2.2 and Appendix B, the former Remediation

Stockpiles were removed from the Ridge Area and disposed off-site in accordance with the Non-OE RDD, if soils were chemically affected; or placed as fill in the North Valley, if approved by DTSC.

1.4 FUTURE LAND USE

The Ridge Area has been proposed for residential use and the South Valley has been proposed for open space (recreational) use, consistent with the Benicia General Plan, as discussed in Section 1.4.4 of the Non-OE RDD and shown on Figure 1-2.

1.5 REMEDIAL GOALS AND ACTIONS

The remedial goals for the Ridge Area and South Valley are as follows:

- Remediate the Ridge Area and South Valley in a manner and to standards that would allow the DTSC to determine that all appropriate response actions have been completed and that no further removal/remedial action is necessary for the Ridge Area and South Valley under the Order issued by the DTSC on June 1, 1999 (Docket No. I/SE 98/99-011).
- Remediate the Ridge Area to a standard suitable for residential use consistent with the City of Benicia General Plan and Zoning Ordinance.
- Remediate the South Valley to a standard suitable for open space use consistent with the City of Benicia General Plan and Zoning Ordinance.

A screening assessment of ecological and human health risks was conducted as part of the RI/FS, and the results were used to develop preliminary soil remediation goals for discrete areas of the Project Site, including the Ridge Area and South Valley, and to identify areas requiring remediation. Preliminary soil remediation goals were developed in the RI/FS for Demolition Site 3 and Flare Site 1; remediation goals for Demolition Site 1 and Flare Sites 2 and 3 were based on the preliminary remediation goals for Flare Site 1 (see Table 2-3 of the Non-OE RDD, Northgate 2002).

The goals for Flare Site 1 and Demolition Site 3 are presented below:

- Flare Site 1: antimony (2.84 milligrams per kilogram [mg/kg]), barium (642 mg/kg), copper (87.7 mg/kg), lead (148 mg/kg, zinc (142 mg/kg), and dioxins (12 picograms per gram [pg/g][1])
- Demolition Site 3: mercury (0.77 mg/kg)

[1] Dioxin concentrations are expressed in terms of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) toxicity equivalence (TEQ).

1.6 ORDNANCE AND EXPLOSIVES (OE) REMEDIAL ACTIVITIES

The majority of OE remedial activities on the site have been completed. OE remedial activities continue in the Ridge Area, parts of Sector 6 and the South Valley, and are being conducted in accordance with the OE RDD. The following OE remedial activities are completed, or are in progress, and have been coordinated with the remediation of chemically affected soils:

- Vegetation removal
- Surface clearance
- Geophysical mapping (Phase 1 and 2)
- Subsurface point clearance across all site sectors (Phase 1 and 2)
- Mechanical excavation of saturated South Valley areas and disposal sites
- Area wide grading
- Disposal of OE Energetic, OE Like, OE scrap, and non-OE metallic debris

2.0 REMEDIATION ACTIVITIES

As discussed in Section 1.4, the Ridge Area and South Valley are proposed for residential and open space land use, respectively. Soils in these areas were remediated to their respective preliminary remedial goals listed in Table 2-3 of the Non-OE RDD (Northgate 2002). OE investigation and clearance and soil removal activities were carried out in portions of the Ridge Area and South Valley areas to remediate impacted soil, in accordance with the OE RDD (Earth Tech 2002b) and Non-OE RDD (Northgate 2002), and Non-OE Field Change Request Nos. 1 through 3 and 6, which are presented in Appendix A. OE investigations and remedial activities were coordinated with the Non-OE investigations because of the potential presence of OE.

The investigative and remedial approach for the Ridge Area and South Valley is as follows:

- Excavation of chemically affected soils at concentrations exceeding the preliminary remedial goals;
- Confirmation sampling in the bottom and sidewalls of the excavations, and analysis by a California-certified laboratory to confirm that chemically affected soils were removed;
- Post-remediation risk assessment to verify that soil remediation goals have been met and residual chemicals do not present a potential risk to human health and ecological receptors.

Analytical data collected by Northgate during remedial work described in this report were reviewed and validated in accordance with the Quality Assurance Project Plan (QAPP, Appendix C of the Non-OE RDD; Northgate 2002) as part of the overall quality assurance program for the Project Site. Additional data collected by Earth Tech and used in the risk assessment had been previously reviewed and validated as part of the RI/FS (Earth Tech 2001). The results of this process indicate that the data collected generally meet project objectives. Some of the analytical results for antimony collected from Flare Sites 1, 2, and 3, Demolition Sites 1 and 3, and the Remediation Stockpile footprints were rejected based on quality control evaluations, as discussed in Appendix C. All data was evaluated and all validated data was available for use in the risk assessment, which is presented in Section 3.0.

A description of the remedial approach for chemically affected soil in the Ridge Area and South Valley was provided in the Non-OE RDD, and the sampling procedure for this area was provided in the Field Sampling and Laboratory Analysis Plan (FSLP; Appendix B of the Non-OE RDD). In accordance with Field Change Request No. 1 (Appendix A), 10 percent of the soil samples were collected in duplicate for quality assurance/ quality control (QA/QC) purposes. Additionally, 10 percent of the samples were collected in duplicate and submitted to APPL Lab

in Fresno, CA, on behalf of the Department of Toxic Substances Control (DTSC) and the United States Army Corps of Engineers (USACE). Appendix D presents laboratory analysis certificates for the Ridge Area and South Valley.

In accordance with Field Change Request No. 2 (Appendix A), perchlorate was added to the list of compounds analyzed for BIP confirmation samples collected after March 10, 2003. Since the BIP samples were collected from Demolition Site 3 before March 10, 2003, perchlorate was not analyzed in these samples. As requested by DTSC, perchlorate was also analyzed for in the Flare and Demolition Sites.

In accordance with Field Change Request No. 3 (Appendix A), some soil samples were sent to STL Denver, a California certified laboratory, in order to achieve necessary turnaround times when other laboratories approved in the QAPP were unable to meet turnaround times. Analyses that STL Denver is approved to perform are listed in the Field Change Request No. 3 in Appendix A, which provides additional details of the requested change.

Field Change Request No. 6 presented in Appendix A, documents a change in procedure for the investigation and remediation of Flare and Demolition Sites in the South Valley Remediation Area. Because of the high density of OE and/ or OE scrap in the Demolition and Flare Sites these areas were mechanically excavated and the excavated soil was moved to the Ridge Area for OE clearance.

As approved in the RAP and described in the Non-OE RDD, chemically-impacted soils were removed from the Ridge Area and South Valley for disposal at an approved off-site facility. As approved by the DTSC, after OE clearance, soils excavated from Demolition Sites 1 and 3 were used as backfill in the North Valley (see Appendix B). Soil handling procedures and air monitoring were performed during excavation and loading operations, as described in Appendix B. The following sections discuss the OE and Non-OE remedial activities in further detail.

2.1 SOUTH VALLEY

2.1.1 Flare Site 1

2.1.1.1 Excavation and Stockpiling

In accordance with Field Change Request No. 6, Flare Site 1 was mechanically excavated to bedrock and the excavated soil was moved to the Ridge Area for OE clearance. Soils surrounding Flare Site 1 were also excavated to a depth of 18" and stockpiled separately on the Ridge for OE clearance and chemical analysis. Soil handling and waste characterization procedures for the Flare Site 1 soils are described in Appendix B.

2.1.1.2 Confirmation Sampling

On August 14 and 19, 2003, subsequent to the excavation and removal of Flare Site 1 and surrounding soils, confirmation samples were collected from the excavation (see Figure 2-1). The area sampled included the bottom and sidewalls of Flare Site 1 and surrounding soil excavation to confirm that all chemically affected Flare Site 1 material was removed. Confirmation samples were collected from the bottom and sidewalls of the excavation at 38 locations placed on a 20-foot grid, as specified in the Non-OE RDD, to verify that chemically affected soils were removed. Soil at each sampling locations was collected using a trowel, placed into laboratory-supplied clean sample jars, and sent to a California state-certified laboratory for analysis. All confirmation samples were analyzed for metals, including strontium, using EPA method 6010B. Five samples were analyzed for dioxins and furans, as specified in the Non-OE RDD. In addition, 10 percent of the samples were analyzed for perchlorate, as requested by the DTSC.

2.1.1.3 Summary of Flare Site 1 Confirmation Sampling Analytical Results

Analytical results for confirmation soil samples collected from Flare Site 1 are summarized in Tables 2-1a through 2-1c.

Analytical results for metals are presented in Table 2-1a. Most metals concentrations, including strontium, were generally within the ranges of ambient concentrations for the Project Site or below human health screening criteria, which are conservative, screening criteria since Flare Site 3 is planned for open space (recreational use). One or more of the metals antimony, barium, copper, lead, and zinc were detected at concentrations exceeding preliminary remedial goals established for the Flare Site 1 in 11 of the 49 confirmation soil samples collected from the bottom and sidewalls of the excavation. Based on the confirmation sample analytical results, soil from nine of the confirmation sample locations was removed by further excavation, as indicated by "yes" in the column under the heading "Soil Removed by Excavation" in Table 2-1a. Five confirmation samples that contained copper at concentrations slightly above the preliminary remedial goal of 87.7 milligrams per kilogram (mg/kg) were left in-place. The maximum concentration of copper in the confirmation samples left in-place was 90 mg/kg (Table 2-1a). A screening risk assessment evaluating residual concentrations of metals is presented in Section 3.0.

Analytical results for perchlorate are presented in Table 2-1b. Perchlorate was detected in five of the confirmation samples, at a maximum concentration of 0.04 milligrams per kilogram (mg/kg), which is less than the health screening criterion for perchlorate (7.8 mg/kg).

Dioxins and/or furans were not detected at concentrations exceeding the preliminary soil remediation goal of 12 pg/g (expressed in 2,3,7,8-TCDD toxicity equivalence [TEQ]; Table 2-1c).

2.1.2 Demolition Site 1

2.1.2.1 Investigation Sampling

On September 17, 2003, six investigation borings, spaced approximately 50 feet from each other, were advanced using a hand auger in Demolition Site 1 (see Figure 2-1). These borings were advanced to a depth of 5 feet below ground surface (bgs) or until the boring could not be advanced further due to dense or caving soils. Samples were collected from each boring at 1-foot, 3-foot, and 5-foot depth intervals, placed into clean, laboratory-supplied sample jars, and sent to a California state-certified laboratory for analysis. Investigation samples were analyzed for 17 California Assessment Manual (CAM-17) metals, polynuclear aromatic hydrocarbons (PAHs), and explosives. In addition, ten percent of the samples were analyzed for dioxins and furans, as specified in the Non-OE RDD.

2.1.2.2 Summary of Demolition Site 1 Investigation Analytical Results

The analytical results for investigation samples collected from Demolition Site 1 are presented in Tables 2-2a through 2-2e.

Analytical results for metals are presented in Table 2-2a. Metals concentrations were generally within the ranges of ambient concentrations for the Project Site or below human health screening criteria, which are conservative, screening criteria since Demolition Site 1 is planned for open space (recreational use). Two investigation samples contained arsenic at concentrations above the 95th percentile of ambient concentrations (18.2 mg/kg, as calculated in the RI/FS). One of these samples was removed by excavation, and the other was left in-place (31 mg/kg; see Table 2-2a). A risk evaluating residual concentrations of metals is presented in Section 3.0.

PAHs and explosives were not detected in any of the investigation samples, and dioxins and furans concentrations were not detected at concentrations exceeding the preliminary soil remediation goal of 12 pg/g (expressed in 2,3,7,8-TCDD TEQ) established as the preliminary remedial goal in the Non-OE RDD for Flare Site 1 (Tables 2-2c through 2-2e).

2.1.2.3 Excavation & Stockpiling

On November 11 and 12, 2003, Demolition Site 1 soils were excavated to bedrock and loaded directly into trucks for transport to the Ridge Area for OE clearance. As further described in

Appendix B, Demolition Site 1 soils were approved by the DTSC for use as back fill in the North Valley. Soil handling procedures are discussed in Appendix B.

2.1.2.4 Confirmation Sampling

Subsequent to excavation and removal of the Demolition Site 1 soils, the excavation base and sidewalls were sampled to confirm that all chemically affected soils had been removed. On November 11 and 12, 2003, 24 confirmation samples were collected from the Demolition Site 1 excavation (see Figure 2-1). The confirmation soil sampling locations were based on a 20-foot grid and an additional sidewall sample was collected at each location when the excavation depth exceeded 7 feet. Soil samples were collected from the surface of the excavation, placed into clean sample jars, and sent to a California state certified laboratory to be analyzed for CAM-17 metals. In addition, ten percent of the samples were analyzed for perchlorate, PAHs, explosives, and dioxins and furans.

2.1.2.5 Summary of Demolition Site 1 Analytical Results

The analytical results for confirmation samples collected from Demolition Site 1 are presented in Tables 2-2a through 2-2e. Metals were not detected or were within the range of ambient concentrations for the Project Site. Perchlorate, PAHs, and explosives were not detected in confirmation samples, and dioxins and furans were not detected at concentrations exceeding the preliminary soil remediation goal of 12 pg/g (expressed in 2,3,7,8-TCDD TEQ) established as the preliminary remediation goal in the Non-OE RDD for Flare Site 1.

2.1.3 Demolition Site 3

2.1.3.1 Investigation Sampling

Investigation of Demolition Site 3 was initiated on July 14 and 15, 2003. Two soil borings were advanced to depths of 1.5 to 2 feet bgs using a hand auger. However, the high density of OE and/ or OE scrap in the Demolition Site 3 area made OE point-clearance and further investigation sampling in the Demolition Site 3 area infeasible. The investigation samples that were collected on July 14 and 15, 2003 were analyzed for mercury. The analytical results for the two investigation sample borings, which were subsequently removed by excavation, are presented in Table 2-3a. In addition, BIP investigation samples were collected from the Demolition Site 3 soils from September 2002 to February 2003 and analyzed for metals and explosives. The analytical results for the BIP investigation samples, which were subsequently removed, are presented in Tables 2-3a and 2-3c.

2.1.3.2 *Excavation & Stockpiling*

Demolition Site 3 excavated soils were moved to the Ridge Area for OE clearance. Soils that were excavated from the upper 18 inches from the area surrounding Demolition Site 3 were stockpiled separately on the Ridge for chemical analysis and OE clearance. As approved by the DTSC, after OE clearance, Demolition Site 3 and surrounding soils were used as fill in the North Valley (see Appendix B).

2.1.3.3 *Confirmation Sampling*

On September 12 and 15, 2003, after all mercury-affected soil had been removed from outside Demolition Site 3, and the soil within the boundary had been excavated to bedrock, confirmation soil samples were collected (see Figure 2-1). The confirmation soil sampling locations were based on a 50-foot grid within the entire area inside and outside of the established boundary of Demolition Site 3, and an additional sidewall sample was collected at each location when the excavation depth exceeded 7 feet. Soil samples were collected, placed into clean sample jars, and sent to a California state certified laboratory to be analyzed for mercury and perchlorate. In addition, ten percent of the confirmation samples were analyzed for CAM-17 metals and dioxins and furans.

2.1.3.4 *Summary of Demolition Site 3 Analytical Results*

Analytical results for confirmation samples collected from Demolition Site 3 are presented in Tables 2-3a through 2-3d. Mercury was not detected or was below the preliminary remedial goal of 0.77 mg/kg in more than 90 percent of the confirmation samples. Ten confirmation samples contained mercury at concentrations above the preliminary remedial goal (the maximum detected concentration was 4.3 mg/kg). No other metals were detected above the human health screening criteria. Perchlorate was not detected in any of the confirmation samples, and dioxins and furans were not detected at concentrations exceeding the preliminary soil remediation goal of 12 pg/g (expressed in 2,3,7,8-TCDD TEQ) established in the Non-OE RDD for the Flare Site. Explosives were not detected at concentrations above the preliminary remedial goals set for open space areas of the TNT Strips (53 mg/kg TNT and 0.5 mg/kg DNT). A screening risk assessment evaluating residual concentrations of chemicals is presented in Section 3.0.

2.1.4 Flare Site 3

2.1.4.1 *Investigation Sampling*

On November 14, 2002, two surface soil samples (SS-SVF3-003 and SS-SVF3-004) were collected from Flare Site 3 in the South Valley to assess the possible presence of chemically affected soil at this location. Sampling was based on visual observations of possible burned

flares during OE clearance. These surface samples were analyzed for CAM-17 metals strontium, perchlorate, and dioxins and furans. Sample results indicated the presence of dioxins and/or furans, as well as metals, above project screening criteria in SS-SVF3-004. On June 12 and 16, 2003, additional investigation sampling was conducted to assess the lateral and vertical extent of chemically affected soils. One investigation boring (SB-SVF3-001) was advanced at the location of SS-SVF3-004, and four step-out borings (SB-SVF3-002, -003, -004, and –005) were advanced approximately 5 feet from boring SB-SVF3-001 (Figure 2-2). Samples were collected from each boring at a depth of 1 foot, placed into clean, laboratory-supplied sample jars, and sent to a California state-certified laboratory to be analyzed. All of the samples were analyzed for CAM-17 metals, perchlorate, and dioxins and furans.

2.1.4.2 Summary of Flare Site 3 Investigation Sampling Analytical Results

The analytical results for investigation samples collected from Flare Site 3 are presented in Tables 2-4a through 2-4c.

Analytical results for metals are presented in Table 2-4a. Metal concentrations for the surface investigation samples were generally below screening criteria for residential soils, which are conservative screening criteria since Flare Site 3 is planned for open space (recreational use). One of the surface samples contained cadmium and zinc slightly above PRGs; the other surface sample (SS-SVF3-004) contained concentrations of antimony, barium, cadmium, copper, lead and zinc well above human health screening criteria. Metals concentrations for the subsurface investigation samples were generally within the ranges of ambient concentrations or below screening criteria. One subsurface investigation sample contained antimony, copper, lead, and zinc above screening criteria, and was removed by excavation. Both surface sample locations and the subsurface investigation sample were subsequently removed by excavation. A screening risk assessment evaluating residual concentrations of metals is presented in Section 3.0.

Analytical results for dioxins and furans are presented in Table 2-4c. Dioxin and/or furan concentrations in Flare Site 3 investigation samples are generally below screening criteria. One investigation sample (SS-SVF3-004) contained dioxins and/or furans above screening criteria. To assess the extent of the chemically-impacted soils, four borings were drilled approximately 5 feet radially from boring SS-SVF3-004. Dioxin was not detected in the soil samples collected from any of these borings. The area represented by sample SS-SVF3-004 was removed by excavation as described below. Perchlorate was not detected in any of the soil samples. Analysis results for these compounds are presented in Tables 2-4b through 2-4c.Excavation & Stockpiling

The Flare Site 3 soils were excavated in October 2003. The soils were mechanically excavated, and the excavated soil was moved to the Ridge Area for OE clearance. Soil handling procedures for the Flare Site 3 soils are described in Appendix B.

2.1.4.3 Confirmation Sampling

On October 23, 24, and 28, 2003, subsequent to the excavation and removal of the Flare Site 3 soils, confirmation samples were collected (see Figure 2-2). The area sampled included the base and sidewalls of the excavation to confirm that all chemically-affected soils had been removed. Confirmation samples were collected from 11 locations, including the bottom and sidewalls of the excavation and at the locations of previous investigation samples. The sample locations were spaced approximately 10 to 20 feet apart (Figure 2-2). Soil from the dry sampling locations was collected from the surface, placed into clean sample jars, and sent to a California state certified laboratory to be analyzed in accordance with Table 2-3. The southern portion of the excavation was located in the wetlands area. Soil from these sampling locations was collected from the top six inches of soil using a sediment sampler with clean acetate liners. The acetate liners were cut to desired length, sealed and capped with Teflon tape and plastic caps, and sent to a California state certified laboratory to be analyzed in accordance with Table 2-3.

2.1.4.4 Summary of Flare Site 3 Confirmation Sampling Analytical Results

Analytical results for confirmation soil samples collected from the Flare Site 3 are summarized in Tables 2-4a and 2-4c.

Analytical results for metals are presented in Table 2-4a. None of the confirmation samples contained metals above preliminary remediation goals. Six of the thirteen non-detected antimony results were rejected based on the data validation presented in Appendix C. A screening risk assessment evaluating residual concentrations of metals is presented in Section 3.0.

Analytical results for dioxins and/or furans are presented in Table 2-4c. None of the four samples analyzed contained dioxins and/or furans at concentrations exceeding the preliminary soil remediation goal of 12 pg/g (expressed in 2,3,7,8-TCDD TEQ). A screening risk assessment evaluating residual concentrations of dioxins and furans is presented in Section 3.0.

2.2 RIDGE AREA

2.2.1 Flare Site 2

2.2.1.1 Investigation Sampling

Prior to the investigation sampling of Flare Site 2, trenching was performed in the area to remove visually observable flare residue. On September 4, 2002 five investigation samples were collected from the bottom of the trench (see Figure 2-3). The soil samples were analyzed for metals, including strontium; perchlorate; and dioxins and furans. The sample of apparent flare residue was analyzed for metals.

2.2.1.2 Summary of Flare Site 2 Investigation Analytical Results

The analytical results for investigation samples collected from Flare Site 2 are presented in Tables 2-5a through 2-5c.

Analytical results for metals are presented in Table 2-5a. The composited soil investigation samples contained barium and zinc at concentrations above the preliminary remedial goals established for the Flare Site 1 in the Non-OE RDD. The sample of apparent granular flare residue (SS-RAF2-005) contained elevated concentrations of metals (aluminum, barium, cadmium, copper, lead, thallium, and zinc), consistent with residue from burning flares. All of the investigation samples were removed by subsequent excavation, as discussed in Section 2.2.1.3.

Low concentrations of perchlorate were detected in the composite soil investigation sample (Table 2-5b). Dioxins and furans were not detected at concentrations exceeding the preliminary soil remediation goal of 12 pg/g (expressed in 2,3,7,8-TCDD TEQ) established in the Non-OE RDD for the Flare Site (Tables 2-2c)

2.2.1.3 Excavation & Stockpiling

In September 2003 the Flare Site 2 soils were excavated. The excavated soils were stockpiled adjacent to the excavation on the northern side. Soil handling procedures and waste characterization for the Flare Site 2 soils are discussed in Appendix B.

2.2.1.4 Confirmation Sampling

Subsequent to the excavation and removal of the Flare Site 2 soils, the excavation base and sidewalls were sampled to confirm that all affected soils had been removed. On September 26, 2003, confirmation samples were collected in Flare Site 2 from an area that was roughly 15 feet by 40 feet (see Figure 2-3). One sample was collected on each of the four sidewalls and two samples were collected on the base of the excavation. The samples were collected from the

excavation surface and placed into clean, laboratory-supplied sample jars and sent to a California state-certified laboratory for analysis of metals, including strontium, and perchlorate. In addition, one sample was analyzed for dioxins and furans.

The analytical results for the initial confirmation samples collected from the south, north, and east walls of the Flare Site 2 excavation contained barium and zinc at concentrations exceeding the preliminary remedial goals for established for the Flare Site 1, indicating further excavation was needed to remove soils affected with metals. In October 2003, the excavation was extended approximately 5 feet towards the south, north, and east. On October 20, 2003, after the additional excavation was completed, confirmation samples were collected in Flare Site 2 from an area that was roughly 25 feet by 50 feet (Figure 2-3). One sample was collected from each of the four sidewalls and two samples were collected from the base of the excavation. The analytical results indicated that the excavation had removed soils with concentrations exceeding preliminary remedial goals; thus, no further excavation or confirmation sampling was necessary.

2.2.2 Remediation Stockpile Footprints

As discussed in Appendix B, the former Remediation Stockpiles were removed from the Ridge Area and disposed off-site in accordance with the Non-OE RDD, if soils were chemically affected; or placed as fill in the North Valley, if approved by DTSC. The following section presents the results of confirmation sampling in the footprints of the former Remediation Stockpiles, which include the footprints of the former North Valley Stockpiles and North Valley Area 1 and 2 stockpiles (which are collectively referred to as the former North Valley Area stockpiles).

2.2.2.1 Confirmation Sampling

Investigation samples were taken in the footprints of the former Remediation Stockpiles in the Ridge Area, after OE clearance activities were completed, to confirm that the Remediation Stockpiles had been removed. Samples collected from the footprints were analyzed for the chemicals of concern affecting the former Remediation Stockpiles. Chemicals of concern for each stockpile is described in the Soil Handling Procedures, Appendix B.

2.2.2.2 Summary of Remediation Stockpile Footprints Confirmation Sampling Analytical Results

Analytical results for confirmation soil samples collected from the Remediation Stockpile footprints are summarized in Tables 2-6a through 2-6e.

Analytical results for metals are presented in Table 2-6a. None of the confirmation samples contained metals above human health screening criteria. A screening risk assessment evaluating residual concentrations of metals is presented in Section 3.0.

Analytical results for TEPH and perchlorate are presented in Table 2-6b. Low concentrations of TEPH diesel (up to 8.3 mg/kg) were detected in confirmation samples collected from the footprint of the former North Valley Area stockpiles. Perchlorate was not detected in any of the confirmation samples collected from the footprint of the former Flare Site 1 stockpile.

Analytical results for PAHs in the former North Valley Area stockpile footprints are presented in Table 2-6c. PAHs were not detected in the confirmation samples collected from the former North Valley Area Stockpile footprints.

Analytical results for dioxins and/or furans are presented in Table 2-6d. None of the confirmation samples collected from the Remediation Stockpile footprints contained dioxins and/or furans at concentrations exceeding the preliminary soil remediation goal of 12 pg/g (expressed in 2,3,7,8-TCDD TEQ).

Analytical results for pesticides in confirmation samples collected from the former North Valley Area 2 stockpile footprint are presented in Table 2-6e. Pesticides were not detected above US EPA residential PRGs in confirmation samples collected from the former North Valley Area 2 stockpile footprint.

3.0 POST-REMEDIATION RISK ASSESSMENT

Screening risk assessments were conducted for the South Valley and Ridge Area in accordance with the Non-OE RDD (Northgate, 2002). These areas are described in Sections 1.2 and 1.3 respectively, and shown on Figure 1-2. This section summarizes results of a post-remediation risk assessment, after completion of the remediation and further investigation efforts in the South Valley and Ridge areas, as discussed in Section 2.0. The purpose of the post-remediation risk assessment is to verify that residual chemical concentrations in these areas are protective of human health and ecological receptors and to identify any areas requiring further evaluation, if needed. The South Valley is an area of approximately 60 acres and has been designated to remain as open space consistent with the Benicia General Plan. The Ridge Area has been proposed for unrestricted residential use. Separate post-remediation assessments were conducted within the South Valley and Ridge Area as follows:

South Valley (Open Space):

- The South Valley Remediation Area consisting of Demolition Site 1, Demolition Site 3, and Flare Site 1
- Flare Site 3
- South Valley Wetland Area

Ridge Area (Residential):

- The Ridge Area consisting of Flare Site 2 and additional Ridge samples previously evaluated in the RI/FS as not requiring remediation
- The footprints of the former Remediation Stockpiles where stockpiles from OE and Non-OE remediation of soil originating elsewhere on the site (see Section 2.2.2) were placed for OE clearance and waste characterization before they were transported off-site for disposal or placed as fill in the North Valley

This human health assessment consists of the following steps: data evaluation, toxicity assessment, exposure assessment, and risk characterization. Each of these steps, and the results and interpretation of the evaluation, is described in Sections 3-1 through 3-5. The ecological screening assessment for the South Valley is presented in Section 3.6.

3.1 DATA EVALUATION

Data evaluation is the process of analyzing site characteristics and analytical data to identify data of sufficient quality for inclusion in a risk assessment, and based on these data, to identify chemicals to be evaluated in the risk assessment.

This post-remediation risk assessment is based on data collected from confirmation sampling as presented in Section 2.0. In addition, samples collected during the RI/FS that were not removed during remediation are included in this post-remediation evaluation. All sample locations are shown on Figures 1-2, 2-1, 2-2, and 2-3. Samples previously collected during the Earth Tech RI/FS are shown in purple in Figure 1-2.

Analytical data were reviewed and validated in accordance with the Quality Assurance Project Plan (QAPP, Appendix C of the Non-OE RDD; Northgate 2002) as part of the overall quality assurance program for the Project Site investigations by Northgate. All other data used in the risk assessment had been previously reviewed and validated as part of the RI/FS. The results of this process indicate that the data collected meet project objectives. As previously discussed in Section 2.0, some analytical results for antimony in the remediation areas were rejected and found not valid because they did not meet laboratory quality control criteria. The impact of the rejected antimony data are discussed in sections below. All chemicals detected in validated soil samples collected were evaluated in the risk assessments except.

With regard to inorganic chemicals, the Site data were first evaluated by comparing with concentrations considered indicative of regional background. The maximum concentrations of the inorganic chemicals detected in the South Valley Area were compared to their respective 95th percentile of the site-specific ambient samples. If the maximum detected concentration was below the ambient value, the chemical was not evaluated further in the risk assessment (i.e., the chemical was not included in the quantitative risk assessment). This practice is consistent with DTSC guidance (Cal EPA, 1997). Four other inorganic chemicals (calcium, magnesium, potassium, and sodium) also were not further evaluated in the post remediation risk assessment because these chemicals are not considered to be of human health concern at environmental concentrations. TEPH have been detected in soil samples collected in the former Remediation Stockpile footprint samples. Such measurements represent mixtures of chemicals that, because of their highly variable composition, do not have descriptive health criteria. Therefore, the toxicity of these mixtures is best described by the aggregate toxicity of key individual chemicals in the mixture, such as PAHs, which were not detected in the former Remediation Stockpile footprint area. Therefore, TEPH and PAHs were not further evaluated in the risk assessment.

It should be noted that, based on a previous evaluation presented in the RI/FS, which included statistical analysis, cumulative probability plots, comparison to literature values, and an

evaluation of spatial distribution, site soils do not appear to have been affected by arsenic, iron, and manganese as a result of DOD activities, and the observed concentrations may be more indicative of ambient levels. As such, the screening-level health risk estimates are presented with and without these chemicals, when these chemicals appear to be driving the excess cancer risk or hazard index.

3.2 TOXICITY ASSESSMENT

The purpose of the toxicity assessment is to evaluate available information regarding the potential for a chemical to cause adverse health effects in exposed individuals (hazard identification) and to estimate the relation between the extent of exposure and the increased likelihood (e.g., probability or chance) and/or severity of adverse effects (dose-response assessment). The result of the dose-response assessment is a set of toxicity criteria that are used in the risk characterization to estimate the likelihood of adverse effects occurring in humans at different exposure levels. The toxicity criteria used to evaluate noncarcinogenic and carcinogenic health risks are referred to as reference doses (RfDs) and slope factors (SFs), respectively. As described further below, potential noncarcinogenic and carcinogenic risks for the residential scenario were estimated using US EPA Region IX Preliminary Remediation Goals (PRGs) for residential soil (USEPA, 2002b). The PRGs are based on current EPA toxicity criteria. In some cases, "California-modified" PRGs are also calculated when toxicity criteria developed by Cal EPA are substantially different than those developed by EPA. In such cases, the California-modified PRGs were used in this assessment.

3.3 EXPOSURE ASSESSMENT

Exposure assessment is the process of measuring or estimating the intensity, frequency, and duration of human exposure to chemicals of concern. As described in the US EPA's Risk Assessment Guidance for Superfund (1989) and more recently in Guidelines for Exposure Assessment (1992), the principal elements of exposure assessment are the following:

- Characterization of the exposure setting (physical environment and potential receptors)
- Identification of exposure pathways (potential sources, points of release, and exposure routes)
- Quantification of health risk estimates

The purpose of the first step is to characterize the most important features of the Site that might influence current or future human exposure to chemicals and to identify potential receptors. Potential pathways of human exposure are identified in the second step by characterizing the sources of chemicals released to the environment, points of release, and potential exposure

routes. In the third step, the qualitative information from the first two steps is integrated with estimates of health risk.

Exposure assessment is conducted within the context of a site conceptual model (SCM). As described in the US EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (US EPA 1988), the purpose of the SCM is to describe what is currently known about chemical sources, likely migration pathways, exposure routes, and possible exposure scenarios, so that the data necessary to evaluate potential health risks are identified. Figure 3-1 presents the SCM developed for the South Valley Area.

3.3.1 Characterization of Exposure Setting

Potential exposure to residual chemicals at a site depends on a number of factors related to the physical characteristics of a site and its surroundings. The Ridge Area has been proposed for residential use and the South Valley has been proposed for open space (recreational) use, consistent with the Benicia General Plan, as discussed in Section 1.4.4 of the Non-OE RDD and shown on Figure 1-2. For purposes of a screening risk assessment, this evaluation assumes direct contact with the residual levels in the South Valley and Ridge Area under a residential use scenario. For the South Valley this is a conservative assumption, in that this area will remain as open space and is not intended for residential use. However, to determine the need for any further evaluation, the risk assessment evaluates the residual chemical levels in these soils under a residential scenario. As part of the grading plan for the Project Site, the Ridge Area soils will be cut to bedrock and placed as fill in the North Valley. A layer of 14 feet of crushed bedrock will be placed over the fill soil. Additionally an ecological assessment is conducted for the soils and sediments in the wetland areas of the South Valley to determine the need for any further evaluation to ensure protection of both terrestrial and aquatic species. As part of the overall development process of the Ridge area, substantial disruption to native grassland and habitat, if present, will occur. Therefore, an ecological screening assessment is not conducted in the Ridge Area.

3.3.2 Identification of Exposure Pathways

Exposure pathways are the means through which an individual may contact a chemical in the environment. Although several potential exposure pathways may exist, only a few may be "complete." For a pathway to be complete, each of the following elements must exist (US EPA 1989):

- A source and mechanism for chemical release
- An environmental transport medium (e.g., air, water, or soil)
- A point of potential contact with the medium

- An exposure route at the contact point (e.g., inhalation, ingestion, or dermal contact).

As shown in Figure 3-1, a recreational and residential scenario is evaluated in which contact with soil via incidental ingestion, dermal contact, and inhalation of vapors or resuspended particulates (i.e., dust) are assumed. All of these pathways are considered in the risk assessment.

Aquatic species in the South Valley Wetlands area may be exposed to chemicals in the sediment. Therefore, a screening assessment of the sediment in the South Valley Wetlands area is conducted.

Shallow groundwater in the South Valley is not currently used for any purpose, and is not expected to be used in the foreseeable future due to limited groundwater occurrence and low formation permeability that does not yield sufficient quantities of water for drinking or irrigation purposes. Therefore groundwater is not considered in this assessment. Hypothetical exposure to both North Valley and South Valley shallow groundwater was evaluated in the RI/FS (Earth Tech 2001).

3.3.3 Health Risk Estimates for Soil

Screening-level health risk estimates are first calculated for each area of interest using maximum detected concentrations along with US EPA Region IX PRGs for residential soil (US EPA, 2002b), which incorporate the potential exposure scenarios of interest. Health risk estimates are also calculated using the 95 percent upper confidence limit (95% UCL) of the mean concentration. The 95% UCL incorporates one-half the detection limits for non-detect chemicals and the maximum values of duplicate samples. The 95% UCL calculations were conducted using ProUCL software recommended by US EPA (US EPA 2002a). Normal and lognormal distributions were determined by using the Shapiro-Wilk or Lillefors test statistics for sample sizes 50 or smaller and greater than 50, respectively. For data that do not fit normal or lognormal distributions, the most conservative UCL value (the highest) of the various non-parametric methods were used to determine the UCL. These calculations are presented in the Appendix E CD-ROM. A further discussion of the use of the 95% UCL in the residential scenario for the Ridge Area is presented in the uncertainty section.

PRGs use current US EPA toxicity values and standard exposure factors to estimate concentrations in environmental media (e.g., soil) that are protective of human health over a lifetime. This method evaluates potential health risks associated with exposure to residual chemicals in soil via incidental ingestion, dermal contact and inhalation of vapors or resuspended particulates (dust) assuming a residential scenario. The specific exposure factors used to calculate the PRGs for this evaluation are provided in Exhibit 4-1 of the PRG documentation issued by US EPA Region IX in 2002 (US EPA, 2002b). Examples of these

factors include a child soil ingestion rate of 200 mg/day, exposure frequency of 350 days per year, and exposure duration of 30 years (6 as a child, 24 as an adult). PRGs are based on either noncancer or cancer effects; the lowest value is chosen as the final PRG for chemicals that may cause both types of effects.

The residential soil PRGs are appropriate for evaluating chemicals detected in soil in the Ridge and South Valley under a conservative residential scenario, because they assume continuous and long-term exposure to chemicals in soil via ingestion, dermal contact, and inhalation of vapors or resuspended soil particulates (dust). Other possible exposure pathways include inhalation of volatile compounds in indoor air and ingestion of non-volatile compounds in homegrown produce. The potential impact of not including these pathways is discussed in the uncertainty section of this report.

3.4 RISK CHARACTERIZATION

Risk characterization represents the final step in the risk assessment process. In this step, the results of the exposure and toxicity assessments are integrated into quantitative or qualitative estimates of potential health risks.

Human health risk estimates are calculated in terms of noncancer hazard indices for chemicals with PRGs based on noncancer effects, and in terms of theoretical lifetime excess cancer risks for chemicals with PRGs based on cancer effects. As described by US EPA Region IX, these estimates are calculated according to the following equations:

Noncancer Hazard Index (HI)

$$HI = \frac{\max conc_a}{PRG_a} + \frac{\max conc_b}{PRG_b} + \ldots + \frac{\max conc_n}{PRG_n}$$

Excess Cancer Risk (ECR)

$$\mathrm{ECR} = [(\frac{\max \mathrm{conc_a}}{\mathrm{PRG_a}}) + (\frac{\max \mathrm{conc_b}}{\mathrm{PRG_b}}) + \ldots + (\frac{\max \mathrm{conc_c}}{\mathrm{PRG_c}})]\mathrm{x}10^{-6}$$

3.4.1 South Valley Remediation Area

The South Valley Remediation Area consists of Demolition Site 1, Demolition Site 3, and Flare Site 1. Soil samples were analyzed for metals (up to 142 samples), explosives (18 samples), PAHs (17 samples), dioxin/furans (17 samples), perchlorate (125 samples), and VOCs (1

sample). The chemicals detected are metals, dioxin and perchlorate. The South Valley will remain as open space and is not intended for residential use. A conservative screening evaluation of this area is conducted using residential assumptions.

The screening results using maximum detected concentrations for the South Valley Remediation Area are presented in Table 3-1a. The estimated total excess cancer risk for the South Valley Area, including arsenic, is 8×10^{-5}. The estimated total excess cancer risk, excluding arsenic, is 6×10^{-7}. The maximum detected concentration of arsenic is 31 mg/kg in a sample collected 5 feet bgs outside of the footprint of Demolition Site 1. The arsenic concentrations in the remaining 95 samples, including samples collected at 1 and 3 feet below ground surface at the same location, are much lower (19 mg/kg and lower) and are near or below the 95th percentile of ambient level of 18.2 mg/kg.

The estimated total noncancer hazard index using maximum detected concentrations for the South Valley Remediation Area, excluding iron and manganese, is 2, primarily based on aluminum and thallium. The estimated total noncancer index, including iron and manganese, is 5 (Table 3-1a).

In addition to the initial screening risk assessment using the maximum detected concentrations, a screening risk assessment is conducted using the 95% upper confidence limit of the chemicals detected in the South Valley soil in order to better represent exposure point concentrations because a potential recreator is likely to move throughout the open space area rather than stay in one place (Table 3-1b). For example, the maximum detected concentration of arsenic in the South Valley Remediation Area soils was 31 mg/kg (Table 3-1a) compared to the 95% UCL concentration of 13.5 mg/kg (Table 3-1b). The maximum detected concentrations of iron and manganese are 51,000 mg/kg and 1,700 mg/kg, compared to their respective 95% UCL concentrations of 46,845 mg/kg and 1,149 mg/kg. US EPA recommends using the 95% UCL of the arithmetic mean to estimate the exposure-point concentration for carcinogenic and chronic non-carcinogenic effects, to account for the uncertainty in estimating the true average concentration at a site (US EPA 2002a). The use of the arithmetic mean concentration as an appropriate measure for estimating exposure derives from the need to estimate an individual's long-term (chronic) average exposure. Therefore, the arithmetic mean is appropriate regardless of the pattern of daily exposures over time or the type of statistical distribution that might best describe the sampling data (US EPA 2002a).

Risk estimates based on the 95% UCL concentration are presented in Table 3-1b. The estimated excess cancer risks are 4×10^{-5}, including arsenic, and 7×10^{-7}, excluding arsenic. The estimated hazard indices are 4, including iron and manganese, and 1, excluding iron and manganese. It is not necessary to conduct an analysis of toxic endpoints because removal of iron and manganese from the analysis shows that the total hazard index is 1 regardless of toxic

endpoint. As discussed in previous reports (e.g., Section 7.1.4.11 of the RI/FS, Earth Tech 2001), the levels of arsenic, manganese and iron detected at the Project Site are likely indicative of ambient values.

Finally, total phosphorus was detected at the South Valley Remediation Area at a maximum value of 930 mg/kg. A PRG has not been developed for this chemical; however, only two of 25 sample concentrations are greater than the 95th percentile of ambient soil concentration of 458 mg/kg, with the other 23 samples at concentrations below the ambient value. Additionally, the 95% UCL concentration for phosphorus is 515 mg/kg. This observed distribution, along with the detailed analysis conducted as part of the RI/FS for the Project Site as a whole, indicates that the South Valley Remediation Area has not been impacted by total phosphorus. The form of phosphorus at the site is not known; however, it is likely that the form is oxidized phosphorus due to the rapid degradation of elemental phosphorus to oxidized phosphorus in the presence of oxygen.

3.4.2 South Valley - Flare Site 3

Soil samples collected at the Flare Site 3 were analyzed for metals (3 samples) and dioxin/furans (1 sample). Only metals were detected. The South Valley will remain as open space and is not intended for residential use. A conservative screening evaluation of this area was conducted using residential assumptions.

The screening results using maximum detected concentrations detected at Flare Site 3 are presented in Table 3-2. Because no carcinogens were detected above ambient concentrations in the area, there is no estimated total excess cancer risk. The estimated total noncancer hazard index using maximum detected concentrations for the Flare Site 3, including iron and manganese, is 0.004 (Table 3-2). The analytical results for antimony are all rejected because they do not meet laboratory quality control criteria (Appendix C). However, in removed confirmation samples with validated antimony results, antimony was not detected above the residential PRG. Therefore, antimony is not expected to have impacted the site.

3.4.3 Ridge Area –Flare Site 2 and Miscellaneous

The Ridge Area consists of Flare Site 2 and an addition area (former Dynamite Burn Site) previously reported in the RIFS as not requiring remediation. In total, the soil samples collected at the Ridge Area were analyzed for metals (up to 9 samples), nitrate/nitrite (up to 7), explosives (9 samples), perchlorate (5 samples), and PAHs (2 samples). The chemicals detected are metals, nitrate and nitrite. The Ridge Area has been proposed for residential use. As part of the grading plan for the Project Site, the Ridge Area soils will be cut to bedrock and placed as fill in the North Valley. A layer of 14 feet of crushed bedrock will be placed over the soils.

The screening results using maximum detected concentrations for the Ridge Area are presented in Table 3-3. The estimated total excess cancer risk for the Ridge Area is 4×10^{-7}.

The estimated total noncancer hazard index using maximum detected concentrations for the Ridge Area, including iron and manganese, is 0.3. The estimated total noncancer index, excluding iron and manganese, is 1 (Table 3-3).

Finally, total phosphorus was detected at the Ridge Area at a maximum value of 61 mg/kg. A PRG has not been developed for this chemical; however, all 5 samples were well below the 95th percentile of ambient soil concentration of 458 mg/kg. The form of phosphorus at the site is not known; however, it is likely that the form is oxidized phosphorus due to the rapid degradation of elemental phosphorus to oxidized phosphorus in the presence of oxygen.

3.4.4 Ridge Area – Former Remediation Stockpile Footprint

The former Remediation Stockpiles consisted of soil taken from chemically-affected OE and Non-OE remediation areas from around the Site. After OE remediation, some of this soil was transported off-site for disposal and some was placed as fill in the North Valley. Appendix B describes the soil handling procedures for the removal of the former Remediation Stockpiles. Soil samples collected in the footprint of the former Remediation Stockpiles were analyzed for metals (25 samples), pesticides (8 samples), perchlorate (8 samples), PAHs (11 samples), dioxin (6 samples) and TEPH (17 samples). The chemicals detected are metals, dioxins and pesticides. The Ridge Area has been proposed for residential use. As part of the grading plan for the Project Site, the Ridge Area soils will be cut to bedrock and placed as fill in the North Valley. A layer of 14 feet of crushed bedrock will be placed over the soils.

The screening results using maximum detected concentrations for the former Remediation Stockpile footprint area are presented in Table 3-4a. The estimated total excess cancer risk for the former Remediation Stockpile footprint area is 5×10^{-5} including arsenic and 2×10^{-6} excluding arsenic. The maximum detection of arsenic is 19 mg/kg, and the 95th percentile ambient level is 18.2 mg/kg. The 2×10^{-6} excess carcinogenic risk is due almost entirely to the low level of pesticides. All individual pesticide concentrations were below their respective residential PRGs.

The estimated total noncancer hazard index using maximum detected concentrations for the former Remediation Stockpiles footprints is 0.009. The analytical results for antimony were all rejected except for two non-detect samples because they do not meet laboratory quality control criteria (Appendix C). However, available validated antimony results for the Flare Sties 1, 2, and 3, Demolition Sites 1 and 3, and Remediation Stockpile waste characterization samples (Table B-1a, Appendix B) indicate that antimony was not detected above the residential PRG.

Therefore, antimony is not expected to have impacted the site based on the low concentrations observed in these samples.

Risk estimates based on the 95% UCL concentration are presented in Table 3-4b. The estimated excess cancer risks are 3 $x10^{-5}$, including arsenic, and 2 x 10^{-6}, excluding arsenic. The estimated hazard index is 0.009. As discussed in previous reports (e.g., Section 7.1.4.11 of the RI/FS, Earth Tech 2001), the levels of arsenic, manganese and iron detected at the Project Site are indicative of ambient values.

Total phosphorus was detected in the former Remediation Stockpile footprint area at a maximum value of 361 mg/kg. A PRG has not been developed for this chemical; however, all 25 samples are well below the 95th percentile of ambient soil concentration of 458 mg/kg. The form of phosphorus at the site is not known; however, it is likely that the form is oxidized phosphorus due to the rapid degradation of elemental phosphorus to oxidized phosphorus in the presence of oxygen. Endrin aldehyde was also detected in the former Remediation Stockpile footprint area. A PRG has not been developed for this chemical; however it was detected in only one of eight samples.

3.5 UNCERTAINTY

Uncertainty is inherent in many aspects of the risk assessment process. Uncertainty generally arises from a lack of knowledge of (1) site conditions and future site use, (2) toxicity and dose-response of the chemicals, and/or (3) the extent to which an individual may be exposed (if at all) to the chemicals. This lack of knowledge means that assumptions must be made based on information presented in the scientific literature or on professional judgment. Although some assumptions have significant scientific basis, many do not. The assumptions that introduce the greatest amount of uncertainty, and their effects on the findings of this post-remediation risk assessment, are discussed below. This discussion is qualitative in nature, reflecting the difficulty in quantifying the uncertainty in specific assumptions. In general, assumptions are selected in a manner that purposely biases the process toward health protection.

3.5.1 Uncertainty Associated with Data Evaluation

All chemicals other than TEPH, inorganic chemicals detected below the 95th percentile of the site-specific ambient dataset; calcium, magnesium, potassium, and sodium; that were detected in validated soil samples collected in the South Valley and Ridge Area are evaluated in this post-remediation risk assessment without regard to frequency of detection or depth of the sample.

3.5.2 Exposure Point Concentrations

An assessment that presents risk estimates based only the maximum detected concentration likely provides a conservative evaluation in that it assumes exposure to all maximum concentrations simultaneously regardless of actual locations. Accordingly, health risk estimates are also calculated based on 95% UCL concentrations in the residential and open space areas when the 95 % UCL is less than the maximum. For the Ridge area (residential area) this was done as opposed to subsets of the data (e.g., hypothetical lots), because the Ridge Area will be cut to bedrock and the soil placed in the North Valley. Therefore, the soil will be excavated, removed, placed in the North Valley, mixed, and covered with 14 feet of crushed bedrock. Using risk estimates based on the 95% UCL is appropriate for the open space areas because it is more likely that a person would move throughout the entire open space area. Nevertheless, the risk assessment evaluates the residual chemical levels in these soils to determine the need for any further evaluation.

3.5.3 Uncertainty Associated with Toxicity Assessment

One of the largest sources of uncertainty in any risk assessment is associated with the limited understanding of the toxicity to humans of exposures to the low concentrations generally encountered in the environment. For example, the majority of the toxicity values used to derive the US EPA Region 9 PRGs are based on animal studies or studies of exposures that are several orders of magnitude greater than what a person may be exposed to in the environment, and incorporate very conservative uncertainty factors that likely overestimate any predicted adverse effects in humans. For some chemicals, no toxicity values have been established and structurally similar chemicals are used as surrogates. In addition, the potential noncarcinogenic health impacts are conservatively assumed to be additive for all chemicals without regard to the target organ affected. The carcinogenic risk estimates are also assumed to be additive. This is a conservative approach since different substances generally have different mechanisms of action and different target organs relative to carcinogenesis.

3.5.4 Uncertainty Associated with Exposure Assessment

The health risk estimates are based on chemical concentrations measured at the site and US EPA Region 9 PRGs for residential soil. PRGs assume continuous and long-term exposure to chemicals in soil via ingestion, dermal contact, and inhalation of vapors or resuspended soil particulates (dust). This is a very conservative assumption because the planned use of the South Valley is to be open space. Therefore the risk estimates presented for the South Valley area are over-estimated because a potential recreator will have significantly less exposure to the area than a resident that lives on the area. Similarly for Ridge Area soils being placed in the North Valley, the risk estimates are also over-estimated because the residents will not have a

complete pathway to come in contact with the soils because the soils will be 14 or more feet below the ground surface.

The Region 9 PRGs do not account for other possible exposure pathways including ingestion of non-volatile chemicals in homegrown produce and inhalation of indoor air. There is considerable uncertainty associated with evaluating potential health risks from these exposure pathways, primarily due to the scientific community's limited understanding of the transport of chemicals in soil into indoor air or plants. Additionally, no volatile chemicals were detected. Volatiles were defined as having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 g/mole (as defined in the US EPA Region 9 PRG Table Users Guide/Technical Background Document, 2002b). Therefore, consideration of volatiles in indoor air is not applicable to the residential portion (Ridge area). Nevertheless, the exclusion of these pathways may underestimate the estimated potential noncancer hazard indices or excess cancer risk for some chemicals in the residential scenario evaluation.

3.6 ECOLOGICAL ASSESSMENT

Potential ecological impacts associated with exposure to chemicals detected in the South Valley soils and sediment are evaluated through use of a screening assessment. This screening-level ecological risk assessment is conducted using methods consistent with the Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities (Cal EPA 1996) as presented in Section 7.2 of the RI/FS. The 95% UCL concentrations of chemicals detected in soils and sediment are compared to ecological screening criteria and chronic sediment quality criterion, respectively.

As a basis for screening risks to ecological receptors, risk-based criteria are developed for chemicals in soils in the grassland habitat that are protective of plants and wildlife. The selection of the criteria is discussed further in Section 7.2.3 of the RI/FS. In summary, when appropriate data are available, soil reference concentrations are developed for plants, soil invertebrates and representative mammal and bird species. For some chemicals, there are no appropriate criteria, while for others there are one to four values for ecological receptors that could be applied in the screening assessment. The most relevant criterion for each chemical is identified using an evaluation process described in Figure 7-2 of the RI/FS. Calculations of soil screening levels for the various ecological receptors have been updated since the RI/FS and are presented in Appendix E of this report.

3.6.1 South Valley Remediation Area

The ecological screening results using 95% UCL soil concentrations detected in the South Valley Remediation Area are presented in Table 3-5. All concentrations are below their

respective ecological screening values except for aluminum, mercury, vanadium and zinc. For aluminum, all screening criteria are below the ambient concentration; therefore the ambient concentration is identified as the screening criterion and the maximum aluminum concentration exceeded the ambient concentration. This situation occurs frequently in these types of evaluations. Aluminum is the most common metallic element in the earth's crust, and the concentrations of aluminum in soils vary widely from 10,000 to 300,000 mg/kg (Dragun, 1988). Total aluminum in soil is not correlated with toxicity to plants or soil invertebrates. The US EPA states that aluminum should be identified as a chemical of potential concern only where the soil pH is less than 5.5 (US EPA, 2003a). pH measurements taken of soil at the Tourtelot site range from 6.4-7.4. Therefore, aluminum is not expected to contribute significantly to any potential ecological concerns. The 95% UCL of mercury (0.42 mg/kg) is only slightly above the most sensitive ecological screening criterion of 0.3 mg/kg for plants (which is also equivalent to the 95th percentile ambient soil concentration). The authors of the mercury criterion for plants describe their confidence in this benchmark as "low" because it is based on a secondary reference and the threshold from the other available reference is more than two orders of magnitude higher [34.9 mg/kg] (Efroysom et al. 1997). These authors caution, "If chemical concentrations reported in field soils that support a vigorous and diverse plant communities exceed one or more of the benchmarks presented in the report or if a benchmark is exceeded by background concentrations, it is generally safe to assume that the benchmark is a poor measure of risk to the plant community at the site". The screening criteria for birds and mammals are 530 mg/kg and 240 mg/kg, respectively. Mercury concentrations in most of the soil samples are within the background range and relatively few samples (17 of 142) are above the most sensitive screening criterion for plants and no samples had concentrations above the other criterion for plants or the criteria for birds and mammals. The situation is similar for zinc with only 4 of 87 samples exceeding the most sensitive screening criterion of 200 mg/kg for soil invertebrates. The zinc screening criteria for birds and mammals are 4600 mg/kg and 720 mg/kg, respectively and no samples had zinc concentrations that exceeded these criteria. Also, in evaluating zinc levels some consideration should be given to the fact that zinc is an essential micronutrient for both plants and animals. In addition, it should be noted that there is a vigorous plant community throughout the South Valley area of the site. The 95% UCL concentration for vanadium is slightly above the 95th percentile concentration of vanadium in ambient soil at the site (99.8 mg/kg compared to 96.4 mg/kg). However, the measured concentrations suggest that vanadium is not at levels significantly above background in site soils.

In some instances, ecological criteria are not readily available. There is not sufficient toxicity data to develop ecological criteria for perchlorate, and there is no obvious surrogate. However, perchlorate was detected in only 2% of the samples analyzed and was found at low ug/kg levels (95% UCL of 0.026 mg/kg). Iron and phosphorous are also not evaluated in this assessment, as they are common constituents in soil and essential elements for biota. Iron is a common

constituent in soil that is found at percent levels that vary widely for different soils. Iron is not very bioavailable in neutral and basic pH soils (US EPA, 2003b) and plants regulate its uptake; in most cases the iron demand of plants is higher than the amount available. Under these soil conditions, iron is not expected to be toxic to plants [or animals] (US EPA, 2003b). Phosphorus is an essential nutrient for plants and phosphorus as phosphate in soil is generally not considered toxic to terrestrial animals. Therefore, the detected concentrations of iron and phosphorus in soil in the South Valley are not expected to contribute significantly to any adverse ecological effects.

3.6.2 Flare Site 3

The ecological screening results for the Flare Site 3 are presented in Table 3-6. The assessment was based on comparison of the maximum detected concentration because of the few samples collected in this area. With the exception of vanadium, all concentrations are below their respective ecological screening values. The maximum concentration for vanadium is below the 95th percentile concentration of vanadium in ambient soil at the site (73 mg/kg compared to 96.4 mg/kg). Therefore, these chemicals are not expected to pose an ecological concern in this area.

3.6.3 South Valley Wetlands Area

Sediment samples collected in the South Valley wetlands area were analyzed for metals (up to 11 samples; 29 for mercury), explosives (3 samples), PAHs (3 samples), dioxins/furans (4 sample), nitrogen/nitrate (2 samples), and methyl mercury (18 samples). These samples are screened by comparing the maximum detected concentration of each chemical to its Chronic Sediment Quality Criterion protective of sediment dwelling organisms, as established in Appendix F of the RI/FS (Earth Tech 2001). Using the 95% UCLs of the sediment concentrations, only copper, iron, manganese and mercury exceed their respective criteria for sediment-dwelling organisms. These values are presented in Table 3-7.

It should be noted that the 95% UCL concentration for copper in sediment (63 mg/kg) is less than the 95th percentile ambient soil concentration suggesting the wetland sediments have not been impacted by an anthropogenic source of copper. Likewise, the iron levels in sediment are similar to ambient soil levels. The 95% UCL concentration of manganese in sediment is essentially equivalent to its sediment quality criterion (1680 mg/kg to 1673 mg/kg). These observations suggest that although the concentrations of these chemicals exceed screening criteria, they do not pose a threat to the wetlands system.

Sediment samples from six of 29 locations in the South Valley Wetland contained total mercury concentrations greater than the sediment criterion of 0.2 mg/kg. Only the two samples from the

0 to 1.5 feet at location WET-7 and one surface sample from WET-1B contained total mercury concentrations greater than 1 mg/kg. This analysis suggests that the more elevated mercury levels are confined to one end (and a small area) of the wetland. Analysis of the these same sediment samples for methyl mercury, the most toxic form of mercury, showed that methyl mercury concentrations are well below the sediment criterion of 0.02 mg/kg for the protection of bird species feeding on aquatic invertebrates (RI/FS Appendix F, Earth Tech 2001). These analyses confirm that no potentially toxic levels of methyl mercury are being produced in the wetland (even in the areas with elevated total mercury levels). Based on the isolated area of sediment with elevated total mercury levels and the absence of elevated methyl mercury levels, no remediation of South Valley Wetland sediment was proposed in the RI/FS, the RAP or is currently proposed in this report. This recommendation is also consistent with the desirable goal of minimizing disturbance and maintaining ecological integrity in natural wetlands.

The ecological screening assessments are not intended to be an assessment providing estimates of theoretical risk to representative plant and animal species, but rather a chemical by chemical screen against the most conservative criterion identified of any receptor group. This screening procedure is therefore chemical and receptor specific and not amenable to analysis of cumulative hazard. However, this approach does provide a conservative assessment, particularly since few chemicals are found at concentrations that exceed the screening criteria and the Site concentration to screening criteria ratio of those chemicals with similar mechanisms of action (e.g. di- and tri-valent metals which might be considered additive for a receptor) are quite small. Additionally, the ecological screening values based on mammals and birds do not consider the foraging patterns of potential ecological receptors. Assuming that all foraging is on vegetation from the South Valley area is unrealistic for wide-ranging species. For example, the home range for deer has been estimated to be from 59 to 520 hectares (Sample and Suter 1994). Assuming the South Valley area is 1-2 hectares, a conservative area use factor for deer would be 30 (59 hectares range/2 hectares on site). Therefore, the screening criteria based on deer likely contain a safety factor of at least 30. A similar type of analysis could be conducted for birds. These facts suggest that a formal analysis of cumulative harm is not necessary to support a conclusion that residual chemical concentrations pose a negligible risk to ecological receptors.

3.7 POST REMEDIATION RISK ASSESSMENT CONCLUSIONS

This section presents the conclusions of a post-remediation risk assessment for the South Valley and Ridge Area soils to verify that the residual chemical concentrations in these areas are protective of human and ecological health. The assessment focuses on potential health risks in which exposure to residual chemicals in soil via incidental ingestion, dermal contact, and inhalation of vapors or particulates is assumed. Additionally, a screening level ecological assessment was conducted for the all areas including wetlands sediment in the South Valley.

The risk assessment assumes a conservative residential exposure with direct contact with the maximum residual levels. This is a very conservative assumption because the planned use of the South Valley is to be open space. With the exception of arsenic, iron and manganese, all individual chemicals are below their respective preliminary remediation goals. Based on a previous evaluation presented in the RI/FS, which included further statistical analysis, cumulative probability plots, comparison to background literature values, and an evaluation of spatial distribution, site soils do not appear to have been impacted by arsenic, iron, or manganese in the South Valley and Ridge Area. We also conducted a further evaluation using the 95% UCL concentration for each of the chemicals to account for the uncertainty in estimating the true average concentration at a site.

There are ranges of cancer risk levels that are applied in health risk assessment. The NCP (40 CFR 300) defines an excess cancer risk range of 10^{-6} to 10^{-4}, depending on site-specific considerations, as being the range of risk considered de-minimis. A carcinogenic risk of less than 10-5 is considered insignificant and of no regulatory interest according to the State of California Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) and the AB2588 Air Toxic Hot Spots Program. The risk estimates for chemicals in soil in the South Valley areas are at or less than these common regulatory benchmarks (i.e., a noncancer hazard of 1 or a theoretical lifetime excess cancer risk of 1×10^{-6}) after considering the 95% UCL concentrations and removing chemicals that are likely to be present at background levels (arsenic, iron, and manganese).

With regard to the Ridge area, the risk estimates for the Remediation Stockpile footprints is slightly above 10^{-6}, however the individual chemicals have excess risks less than 1×10^{-6}. All soils in the Ridge Area will be cut to bedrock and placed in the North Valley. Therefore these soils are not expected to pose any health concern.

An ecological screening assessment is conducted for the soil in the South Valley and sediment in the wetlands areas. Results of the ecological soil screening evaluation in each area indicate that the soil concentrations are below screening criteria except for aluminum, mercury, vanadium and zinc in the South Valley. Results of the screening ecological sediment screening evaluation in each area indicate that the sediment concentrations are below Chronic Sediment Quality Criteria except for copper, iron, manganese and mercury in the South Valley. The ecological screening assessment is not intended to be an assessment providing estimates of theoretical risk to representative plant and animal species, but rather a chemical-by-chemical screen against the most conservative criterion identified of any receptor group. Use of conservative assumptions in the ecological screening assessment suggest that a formal analysis of cumulative harm is not necessary to support a conclusion that residual chemical concentration pose a negligible risk to ecological receptors. The screening assessment

compares the 95% UCL concentration of each chemical to the most sensitive receptor and the most sensitive toxicological endpoints. It is not appropriate to calculate a cumulative risk estimate since the toxicological endpoints for each receptor varies by chemical. The ecological assessment of the wetlands sediments indicate that the concentrations of chemicals detected in the soil and sediment of the South Valley do not pose any ecological concerns or any threat to the wetlands system.

The results of this post-remediation risk assessment should be interpreted within the context of the uncertainty that is inherent in many aspects of the risk assessment process. The primary uncertainties associated with this assessment include:

- Inclusion of essentially all detected chemicals regardless of detection frequency or depth of sample. This assumption is more likely to overestimate potential health risks, especially when those estimates are based on maximum detected concentrations.

- Inclusion of direct exposure to chemicals in soil via incidental ingestion, dermal contact, and inhalation of vapors or particulates (dust) under a residential scenario. This is a conservative assumption for the South Valley given that the South Valley will be open space and for the Ridge given that these soils will be excavated, taken to the North Valley and covered with 14 of clean bedrock fill.

Based on these and other uncertainties, we believe that the health risk estimates presented herein represent conservative estimates of the risks, if any, posed by residual chemicals in soils in the South Valley and Ridge Area.

4.0 SUMMARY AND CONCLUSIONS

4.1 SUMMARY OF ACTIVITIES

Between 2002 and November 2003, Pacific Bay Homes completed non-OE remedial activities in the Ridge Area and South Valley. This work was performed under DTSC oversight, in accordance with the approved final Non-OE RDD, and other related support plans for the Site. The remedial activities included the following principal components:

- Investigation sampling of Flare Site 2, Flare Site 3, and Demolition Site 1, and former Remediation Stockpile footprints in the Ridge Area
- Excavation and stockpiling of chemically impacted soils from Flare Site 1, Flare Site 2, Flare Site 3, Demolition Site 1, and Demolition Site 3;
- Off-site disposal of soils with chemical concentrations exceeding the remediation goals and/or DTSC requirements;
- Confirmation sampling to confirm removal of chemically impacted soils.

4.2 CONCLUSIONS

In accordance with the remediation plans approved by DTSC, remediation of chemically-affected soils within the Ridge Area and South Valley has been achieved. All areas identified in the Non-OE RDD as well as chemically-affected areas encountered during OE point clearance have been excavated and removed from the Ridge Area and South Valley. Confirmation samples indicate that chemically-impacted soil has been removed from these areas.

The majority of OE remedial activities have been completed, and other OE remedial activities are ongoing and are being conducted in accordance with the OE RDD. A Conceptual Site Model has been prepared to address the distribution of OE throughout the Project Site as well as offsite issues. The Conceptual Site Model will be used for assessing whether the OE clearance action is complete.

The OE-cleared soil from the Ridge Area and South Valley that is not chemically-impacted will be placed in the North Valley. These Project Site OE cleared soils will then be covered with a minimum of 14 feet of OE-free crushed bedrock.

A post-remediation risk assessment was conducted to verify that the residual chemical concentrations in the Ridge Area and South Valley Sites areas are protective of human health and the environment and to identify any areas requiring further evaluation, if needed. A final overall human health and ecological risk assessment will be performed for the Project Site,

which will address all of the discrete areas that have been considered separately in this and previous Non-OE reports.

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TABLES

Table 2-1a
South Valley Remediation Area - Flare Site 1
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	390	150	390	390	45000	5.2	550	23000
Preliminary Remediation Goals			2.84		642					87.7	148								142
Confirmation Samples																			
SS-F1BE-001	Yes	8/14/03	<1.1	15	300	0.75	<0.56	61	20	**130**	32	<2.2	52	3.1	<1.1	35	2.3	110	130
SS-F1BE-001-001		9/24/03	<2.4 R	11 J	180 J	0.43 J	0.2 J	37 J	14 J	63 J	17	0.14 J	46 J	<2.4 J	0.03 J	33	<1.2 UJ	65 J	77 J
SS-F1BE-002	Yes	8/14/03	<1.1	16	330	0.7	<0.55	59	18	80	27	<2.2	48	3.8	<1.1	32	2.3	120	110
SS-F1BE-002-001		9/24/03	<2.299 R	8.8 J	170 J	0.35 J	0.19 J	34 J	13 J	50 J	16	<1.2 UJ	40 J	<2.299 J	<1.2 UJ	31	<1.2 UJ	53 J	67 J
SS-F1BE-003		8/14/03	<1.2	15	250	0.8	<0.579	60	22	65	12	<2.299	54	2.6	<1.2	40	2.6	110	96
SS-F1BE-004		8/14/03	<1.1	15	340	0.82	<0.56	67	20	85	29	<2.2	75	2.9	<1.1	43	2.1	99	110
SS-F1BE-005		8/14/03	<1.1	15	290	0.82	<0.56	66	20	**88**	62	<2.2	63	3	<1.1	50	2.1	100	110
SS-F1BE-006	Yes	8/14/03	<1.1	16	280	0.76	<1.2	66	19	**98**	54	<2.2	63	3.8	<1.1	50	2.2	91	110
SS-F1BE-006-001		9/24/03	<2.2 R	8.1 J	200 J	0.38 J	0.17 J	33 J	12 J	67 J	45	<1.1 UJ	38 J	<2.2 J	<1.1 UJ	58	<1.1 UJ	49 J	120 J
SS-F1BE-007	Yes	8/14/03	<1.1	16	260	0.8	<0.56	63	21	**110**	20	<2.2	60	3.2	<1.1	38	2.3	100	120
SS-F1BE-007-001		9/24/03	<2.4 R	9.2 J	160 J	0.33 J	0.12 J	34 J	13 J	51 J	12	<1.2 UJ	39 J	0.51 J	<1.2 UJ	30	<1.2 UJ	51 J	66 J
SS-F1BE-008	Yes	8/14/03	<1.1	14	720	0.93	<0.569	59	21	85	18	<2.299	130	2.7	<1.1	51	3.6	97	110
SS-F1BE-008-001		9/24/03	<2.299 R	5.8 J	160 J	0.39 J	0.14 J	34 J	13 J	46 J	12	<1.1 UJ	43 J	<2.299 J	<1.1 UJ	27	<1.1 UJ	49 J	60 J
SS-F1BE-009	Yes	8/14/03	<1.1	16	270	0.82	<0.569	64	19	87	39	<2.299	59	3.3	<1.1	48	2.3	98	110
SS-F1BE-009-001		9/24/03	<2.299 R	7 J	180 J	0.33 J	0.16 J	30 J	13 J	49 J	22	<1.1 UJ	38 J	0.33 J	<1.1 UJ	39	<1.1 UJ	45 J	65 J
SS-F1BE-010	Yes	8/14/03	**4.4**	15	**1200**	0.77	<0.55	64	21	**220**	**1100**	<2.2	63	3	<1.1	410	2.2	98	**260**
SS-F1BE-010-001		9/24/03	<2.4 R	7.5 J	200 J	0.39 J	0.035 J	31 J	12 J	51 J	7.6	0.38 J	38 J	<2.4 J	<1.2 UJ	34	<1.2 UJ	38 J	68 J
SS-F1BE-011		8/14/03	<1.1	15	270	0.81	<0.569	65	20	**88**	45	<2.299	61	2.7	<1.1	51	1.6	100	110
SS-F1BE-012		8/14/03	<1.2	15	260	0.94	<0.579	67	18	61	12	<2.299	56	3.1	<1.2	42	2.4	98	90
SS-F1BE-013		8/14/03	<1.1	15	250	0.79	<0.55	64	19	87	30	<2.2	57	2.6	<1.1	41	2.1	100	100
SS-F1BE-014		8/14/03	<1.1	15	280	0.77	<0.55	64	19	86	53	<2.2	59	2.9	<1.1	46	2.3	100	110
SS-F1BE-017		8/14/03	<1.1	14	260	0.87	<1.2	68	23	67	13	<2.2	63	2.6	<1.1	41	2.7	100	93
SS-F1BE-018	Yes	8/14/03	<1.2	14	280	0.94	<1.299	68	19	**91**	26	<2.299	58	2.1	<1.2	44	2.8	99	95
SS-F1BE-018-001		9/24/03	<2.4 R	7.4 J	210 J	0.38 J	0.11 J	29 J	11 J	44 J	7	0.4 J	36 J	<2.4 J	<1.2 UJ	36	<1.2 UJ	45 J	57 J
SS-F1BE-018-501		9/24/03	<2.4 R	7.3 J	190 J	0.4 J	0.044 J	30 J	12 J	43 J	7.3	0.38 J	37 J	0.32 J	<1.2 UJ	39	<1.2 UJ	46 J	57 J
SS-F1BE-019		8/14/03	<1.1	15	230	0.77	<1.2	66	20	79	37	<2.2	61	2.3	<1.1	36	3.3	100	100
SS-F1BE-021	Yes	8/14/03	2.2	16	330	0.71	<0.529	59	20	**130**	**240**	<2.099	56	2.1	<1.1	76	3	100	140
SS-F1BE-021-001		9/24/03	<2.299 R	12 J	100 J	0.25 J	0.045 J	31 J	18 J	61 J	7	<1.1 UJ	45 J	0.71 J	<1.1 UJ	30	<1.1 UJ	41 J	72 J
SS-F1BE-022		8/14/03	<1.1	15	220	0.73	<0.54	69	24	76	14	<2.2	76	1.7	<1.1	43	2.6	86	97
SS-F1BE-024		8/14/03	<1.1	18	270	0.95	<1.2	61	19	71	24	<2.099	63	2.6	<1.1	38	2.1	95	94

Table 2-1a
South Valley Remediation Area - Flare Site 1
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	390	150	390	390	45000	5.2	550	23000
Preliminary Remediation Goals			2.84		642					87.7	148								142
SS-F1BE-025		8/14/03	<1.1	17	260	0.92	<0.54	59	20	73	19	<2.2	56	2.8	<1.1	44	2.7	89	92
SS-F1BE-028		8/14/03	<1.1	16	250	0.78	<0.529	59	18	71	20	<2.099	53	2.2	<1.1	43	2.2	96	92
SS-F1BE-029		8/14/03	<1.1	17	290	0.91	<0.54	63	20	72	17	<2.2	71	2.3	<1.1	38	3	88	97
SS-F1BE-030		8/14/03	<1	15	270	0.75	<0.519	58	36	82	17	<2.099	70	2.1	<1	36	2.1	94	110
SS-F1BE-031		8/19/03	<2.099 R	8.3 J	210	<0.529	4.9	37	15	59	13 J	1.8 J	43	<2.099 UJ	<1.1	39.6	<1.1 UJ	54	70 J
SS-F1BE-032		8/19/03	<2.099 R	6.2 J	140	<0.529	4.6	36	16	54	7.3 J	1.5 J	43	<2.099 UJ	<1.1	33.6	<1.1 UJ	49	61 J
SS-F1BE-035		8/19/03	<2.099 R	6.7 J	180	<0.529	4.6	36	16	60	20 J	1.5 J	43	<2.099 UJ	<1.1	34.6	<1.1 UJ	50	70 J
SS-F1BE-036		8/19/03	<2.2 R	8.4 J	210	<0.55	4.5	34	13	57	7 J	1.4 J	39	<2.2 UJ	<1.1	36.2	<1.1 UJ	45	66 J
SS-F1BE-037		8/19/03	<2.099 R	8.5 J	190	<0.529	4.6	33	16	55	8.6 J	1.5 J	43	<2.099 UJ	<1.1	32.1	<1.1 UJ	45	66 J
SS-F1BE-038		8/19/03	<2.099 R	5 J	140	<0.54	4.2	34	13	48	9.8 J	1.4 J	39	<2.099 UJ	<1.1	24.8	<1.1 UJ	48	60 J
SS-F1BE-05D		8/14/03	<1.1	15	270	0.75	<0.56	61	18	78	44	<2.2	58	3.3	<1.1	46	2.9	100	110
SS-F1BE-19D		8/14/03	<1.1	13	290	0.77	<1.399	73	22	**90**	19	<2.299	72	2.3	<1.1	44	3.4	95	110
SS-F1SE-015		8/14/03	<1.1	15	280	0.81	<0.55	65	22	85	44	<2.2	63	3.1	<1.1	56	2.2	100	110
SS-F1SE-016		8/14/03	<1.1	15	270	0.81	<0.55	66	21	87	62	<2.2	62	2.8	<1.1	53	2.6	99	110
SS-F1SE-020		8/14/03	<1.1	16	240	0.78	<1.2	68	20	**88**	24	<2.2	63	1.8	<1.1	37	3.1	100	100
SS-F1SE-023		8/14/03	<1.1	14	270	0.81	<1.2	64	19	66	28	<2.2	58	1.9	<1.1	42	2.6	99	90
SS-F1SE-026		8/14/03	<1.1	14	250	0.79	<1.2	47	22	72	11	<2.099	45	2.4	<1.1	41	2.8	98	97
SS-F1SE-027		8/14/03	<1.1	17	190	0.57	<0.529	39	19	47	11	<2.099	41	1.9	<1.1	37	1.9	73	81
SS-F1SE-16D		8/14/03	1.1	15	270	0.84	<0.55	64	24	**89**	68	<2.2	68	3.4	<1.1	60	1.9	96	**240**

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in **bold** type.
CAM 17 metals analyzed using EPA Method 6010B/7471A.

1 "Yes" indicates that the sample was removed by further excavation.
J1 The concentration is approximate because it is less than the reporting limit.
J The numerical value is the approximate concentration of the analyte in the sample, due to some type of QC exceedance.
R Data rejected based on QC exceedances (see Appendix D for data validation results).
UJ The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure t
mg/kg milligrams per kilogram
Sample IDs: SS-FIBE-002-001 denotes a surface soil confirmation sample; -F1BE is a location identifier indicating the sample was collected from the Flare Site, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-F1BE-018-501 is a split duplicate sample.

Table 2-1b

South Valley Remediation Area - Flare Site 1

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
Confirmation Samples			
SS-F1BE-001	Yes	8/14/03	0.04
SS-F1BE-001-001		9/24/03	<0.059
SS-F1BE-002	Yes	8/14/03	0.0055 J1
SS-F1BE-002-001		9/24/03	<0.059
SS-F1BE-003		8/14/03	<0.012
SS-F1BE-004		8/14/03	<0.011
SS-F1BE-005		8/14/03	<0.011
SS-F1BE-006	Yes	8/14/03	<0.011
SS-F1BE-006-001		9/24/03	<0.056
SS-F1BE-007	Yes	8/14/03	<0.011
SS-F1BE-007-001		9/24/03	<0.059
SS-F1BE-008	Yes	8/14/03	<0.011
SS-F1BE-008-001		9/24/03	<0.057
SS-F1BE-009	Yes	8/14/03	<0.011
SS-F1BE-009-001		9/24/03	<0.057
SS-F1BE-010	Yes	8/14/03	<0.011
SS-F1BE-010-001		9/24/03	<0.057
SS-F1BE-011		8/14/03	<0.011
SS-F1BE-012		8/14/03	<0.012
SS-F1BE-013		8/14/03	<0.011
SS-F1BE-014		8/14/03	<0.011
SS-F1BE-017		8/14/03	<0.011
SS-F1BE-018	Yes	8/14/03	0.0069 J1
SS-F1BE-018-001		9/24/03	<0.059
SS-F1BE-018-501		9/24/03	<0.059
SS-F1BE-019		8/14/03	<0.011
SS-F1BE-021	Yes	8/14/03	<0.011
SS-F1BE-021-001		9/24/03	<0.057
SS-F1BE-022		8/14/03	<0.011
SS-F1BE-024		8/14/03	<0.011
SS-F1BE-025		8/14/03	<0.011
SS-F1BE-028		8/14/03	<0.011
SS-F1BE-029		8/14/03	<0.011
SS-F1BE-030		8/14/03	<0.01
SS-F1BE-031		8/19/03	<0.011
SS-F1BE-032		8/19/03	<0.011
SS-F1BE-035		8/19/03	0.03
SS-F1BE-036		8/19/03	<0.011
SS-F1BE-037		8/19/03	<0.011
SS-F1BE-038		8/19/03	<0.011
SS-F1BE-05D		8/14/03	<0.011
SS-F1BE-19D		8/14/03	<0.011
SS-F1SE-015		8/14/03	<0.011
SS-F1SE-016		8/14/03	<0.011
SS-F1SE-020		8/14/03	<0.011

Ta[illegible]-1b

South Valley Remediation Area - Flare Site 1

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
SS-F1SE-023		8/14/03	<0.011
SS-F1SE-026		8/14/03	<0.011
SS-F1SE-027		8/14/03	<0.011
SS-F1SE-16D		8/14/03	0.0057 J1

Notes:

1 "Yes" indicates that the sample was removed by further excavation.

J1 The concentration is approximate because it is less than the reporting limit.

mg/kg milligrams per kilogram

Sample IDs: SS-FIBE-002-001 denotes a surface soil confirmation sample; -F1BE is a location identifier indicating the sample was collected from the Flare Site, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-F1BE-018-501 is a split duplicate sample.

Table 2-1c
South Valley Remediation Area - Flare Site 1
Dioxin and Furan Analytical Results
(concentrations expressed in pg/g)

Sample ID	Soil Removed by Excavation[1]	Sample Date	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF	TEQ
Preliminary Soil Remediation Goal[2]																				12
Confirmation Samples																				
SS-F1BE-008-001		9/24/03	<1.7	7.4	2.9	<1.6	<1.1	<1.5	<1	<1.5	<1.2	<2.799	<1.799	<1.1	<1.799	<0.99	<0.8	7	14	2.3
SS-F1BE-009-001		9/24/03	<0.86	<1.299	<0.62	<0.54	<0.3	<0.519	<0.37	<0.49	<0.34	<0.959	<0.629	<0.31	<0.629	<0.36	<0.54	5.9	<2.099	0.79
SS-F1BE-021	Yes	8/14/03	2.9	<1.299	<0.389	<0.529	<0.81	<0.5	<0.449	<0.5	<0.55	<0.79	<0.639	<0.569	<0.67	<0.639	<0.68	13	<1.6	0.99
SS-F1SE-016		8/14/03	<2.4	<1.6	<0.33	<0.529	<0.389	<0.509	<0.37	<0.49	<0.449	<0.6	<0.46	<0.55	<0.479	<0.37	<0.85	12	<2.299	0.7
SS-F1SE-026		8/14/03	<0.49	<0.27	<0.319	<0.419	<0.379	<0.409	<0.36	<0.4	<0.43	<0.649	<0.469	<0.4	<0.46	<0.639	<0.43	<2.7	<0.74	0.78

Notes:

Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in **bold** type.

1 "Yes" indicates that the sample was removed by further excavation.

2 The preliminary soil remediation goal for dioxins is expressed in terms of 2,3,7,8-TCDD toxicity equivalence (TEQ).

Dioxins/furans analyzed using EPA method 8290.

pg/g picograms per gram

Sample IDs: SS-F1BE-008-001 denotes a surface soil confirmation sample; -F1BE is a location identifier indicating the sample was collected from the Flare Site, bottom of excavation; -008 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additional 1-foot lift of soil was removed.

Table 2-2a
South Valley Remediation Area - Demolition Site 1
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
Investigation Samples																				
SB-1DSI-001-001		9/17/03	<1	13	210	0.84	0.74	64	19	56	17	0.065	<2	55	<1.299	<1	NA	<1.2	87	86
SB-1DSI-001-003		9/17/03	<1	12	230	0.89	<0.5	63	17	56	9.9	0.053	<2	55	<1.299	<1	NA	<1.2	87	77
SB-1DSI-001-005		9/17/03	<1.299	17	310	1.1	0.65	75	27	74	14	0.078	<2.5	74	<1.6	<1.299	NA	<1.5	97	100
SB-1DSI-002-001	Yes	9/17/03	<1.1	15	200	0.85	0.71	67	17	61	14	0.073	<2.299	58	<1.5	<1.1	NA	<1.399	100	92
SB-1DSI-002-003	Yes	9/17/03	<1.2	18	270	0.96	7.1	79	22	150	72	1.1	<2.4	69	<1.5	<1.2	NA	<1.399	110	8000
SB-1DSI-002-503	Yes	9/17/03	1.5	22	280	0.91	3.7	92	24	150	200	0.2	8.1	94	<1.5	<1.2	NA	<1.399	96	3100
SB-1DSI-002-005	Yes	9/17/03	<1.2	15	270	1	0.64	78	23	74	15	0.042	<2.4	71	<1.5	<1.2	NA	<1.399	110	140
SB-1DSI-003-001		9/17/03	<1.1	15	220	0.83	<0.55	70	20	59	13	0.077	<2.2	62	<1.399	<1.1	NA	<1.299	100	95
SB-1DSI-003-003		9/17/03	<1.2	14	370	0.97	0.61	76	24	79	11	0.082	<2.299	80	<1.5	<1.2	NA	<1.399	100	110
SB-1DSI-003-005		9/17/03	<1.1	31	280	0.7	<0.55	49	23	48	6.9	0.083	<2.2	40	<1.399	<1.1	NA	<1.299	100	85
SB-1DSI-004-001	Yes	9/17/03	<1.1	14	230	0.85	<0.56	69	24	61	15	0.086	<2.2	66	<1.5	<1.1	NA	<1.299	98	93
SB-1DSI-005-001[2]	Yes	9/17/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.13	NA	NA	NA	NA	NA	NA	NA	NA
SB-1DSI-005-501	Yes	9/17/03	<1.1	15	210	0.85	0.59	72	18	64	18	0.22	<2.299	62	<1.5	<1.1	NA	<1.399	100	100
SB-1DSI-005-003	Yes	9/17/03	<1.2	16	280	0.97	0.83	85	22	83	47	0.078	<2.4	77	<1.5	<1.2	NA	<1.399	110	110
SB-1DSI-006-001	Yes	9/17/03	<1.1	15	230	0.97	0.62	78	19	71	18	0.061	<2.299	66	<1.5	<1.1	NA	<1.399	100	110
SB-1DSI-006-003	Yes	9/17/03	<1.2	16	370	1	1	69	21	92	27	0.1	<2.4	66	<1.5	<1.2	NA	<1.399	100	120
Confirmation Samples																				
SS-1DBE-004		11/11/03	<2.4 UJ	11 J	260 J	<0.6 UJ	<0.6 UJ	39 J	15 J	56	23 J	0.082 J	<1.2 UJ	43 J	<2.4 UJ	<1.2	61	<1.2 UJ	56 J	65 J
SS-1DBE-005		11/11/03	<2.799 UJ	8.4 J	190 J	<0.689 UJ	<0.689 UJ	38 J	14 J	46	6.5 J	<0.068	<1.399 UJ	46 J	<2.799 UJ	<1.399	54	<1.399 UJ	53 J	55 J
SS-1DBE-006		11/11/03	<2.9 UJ	9.1 J	170 J	<0.73 UJ	<0.73 UJ	36 J	14 J	59	21 J	0.12 J	<1.5 UJ	41 J	<2.9 UJ	<1.5	42	<1.5 UJ	51 J	69 J
SS-1DBE-007		11/11/03	<2.7 UJ	9.4 J	210 J	<0.67 UJ	<0.67 UJ	34 J	19 J	57	13 J	<0.067	<1.299 UJ	41 J	<2.7 UJ	<1.299	77	<1.299 UJ	51 J	64 J
SS-1DBE-008		11/11/03	<3 UJ	7.5 J	200 J	<0.75 UJ	<0.75 UJ	34 J	14 J	44	7 J	0.09 J	<1.5 UJ	45 J	<3 UJ	<1.5	83	<1.5 UJ	41 J	58 J
SS-1DBE-009		11/11/03	<2.4 UJ	5.9 J	140 J	<0.61 UJ	<0.61 UJ	33 J	9.7 J	35	4.4 J	0.072 J	<1.2 UJ	36 J	<2.4 UJ	<1.2	98	<1.2 UJ	36 J	47 J
SS-1DBE-010		11/11/03	<2.7 UJ	8.4 J	140 J	<0.67 UJ	<0.67 UJ	30 J	13 J	48	8.6 J	0.11 J	<1.299 UJ	46 J	<2.7 UJ	<1.299	65	<1.299 UJ	30 J	63 J
SS-1DBE-510		11/11/03	<2.799 UJ	8 J	170 J	<0.689 UJ	<0.689 UJ	29 J	13 J	43	7.1 J	0.075 J	<1.399 UJ	40 J	<2.799 UJ	<1.399	62	<1.399 UJ	40 J	54 J
SS-1DBE-011		11/11/03	<2.5 UJ	6.8 J	190 J	<0.62 UJ	<0.62 UJ	27 J	16 J	42	7.2 J	0.069 J	<1.2 UJ	40 J	<2.5 UJ	<1.2	78	<1.2 UJ	36 J	52 J
SS-1DBE-012		11/11/03	<2.7 UJ	5.8 J	170 J	<0.67 UJ	<0.67 UJ	29 J	15 J	45	8.2 J	<0.067	<1.299 UJ	44 J	<2.7 UJ	<1.299	70	<1.299 UJ	36 J	60 J
SS-1DSW-005		11/11/03	<2.4 UJ	9 J	120 J	<0.589 UJ	<0.589 UJ	34 J	16 J	56	8.2 J	0.091 J	<1.2 UJ	47 J	<2.4 UJ	<1.2	65	<1.2 UJ	36 J	64 J
SS-1DSW-006		11/11/03	<2.5 UJ	5.6 J	130 J	<0.62 UJ	<0.62 UJ	30 J	16 J	56	5.8 J	0.11 J	<1.2 UJ	45 J	<2.5 UJ	<1.2	90	<1.2 UJ	34 J	62 J
SS-1DSW-007		11/12/03	<2.4 R	6.4 J	240	<0.589 UJ	<0.589 UJ	34 J	15 J	49	8.1 J	<0.059	<1.2 UJ	38 J	<2.4 UJ	<1.2 UJ	28	<1.2 UJ	46	57 J
SS-1DSW-507		11/12/03	<2.299 R	7.3 J	270	<0.569 UJ	<0.569 UJ	35 J	16 J	52	7.8 J	0.058 J	<1.1 UJ	46 J	<2.299 UJ	<1.1 UJ	28	<1.1 UJ	45	57 J
SS-1DSW-008		11/12/03	<2.299 R	5.9 J	170	<0.579 UJ	<0.579 UJ	33 J	15 J	58	9 J	0.073 J	<1.2 UJ	42 J	2.4 UJ	<1.2 UJ	29	<1.2 UJ	42	67 J
SS-1DSW-009		11/12/03	<2.299 R	15 J	130	<0.569 UJ	<0.569 UJ	27 J	16 J	45	6.4 J	0.094 J	<1.1 UJ	42 J	<2.299 UJ	<1.1 UJ	47	<1.1 UJ	39	61 J
SS-1DSW-010		11/12/03	<2.299 R	6 J	140	<0.589 UJ	<0.589 UJ	39 J	15 J	51	6.2 J	0.09 J	<1.2 UJ	43 J	<2.299 UJ	<1.2 UJ	35	<1.2 UJ	40	60 J
SS-1DSW-011		11/12/03	<2.299 R	13 J	270	<0.569 UJ	<0.569 UJ	27 J	7.8 J	38	4.9 J	0.058 J	<1.1 UJ	31 J	<2.299 UJ	<1.1 UJ	68	<1.1 UJ	29	45 J
SS-1DSW-012		11/12/03	<2.4 R	14 J	120	<0.589 UJ	<0.589 UJ	35 J	14 J	47	6.4 J	0.075 J	<1.2 UJ	43 J	2.4 UJ	<1.2 UJ	35	<1.2 UJ	39	60 J
SS-1DSW-013		11/12/03	<2.299 R	5.4 J	120	<0.569 UJ	<0.569 UJ	26 J	12 J	41	5.8 J	0.098 J	<1.1 UJ	34 J	<2.299 UJ	<1.1 UJ	38	<1.1 UJ	30	54 J
SS-1DSW-014		11/12/03	<2.299 R	6.3 J	120	<0.579 UJ	<0.579 UJ	31 J	11 J	51	6.2 J	0.08 J	<1.2 UJ	41 J	<2.299 UJ	<1.2 UJ	100	<1.2 UJ	30	60 J
SS-1DSW-015		11/12/03	<2.4 R	6.5 J	140	<0.6 UJ	<0.6 UJ	27 J	13 J	44	6.5 J	0.084 J	<1.2 UJ	40 J	<2.4 UJ	<1.2 UJ	60	<1.2 UJ	25	58 J
SS-1DSW-016		11/12/03	<2.4 R	8.7 J	200	<0.6 UJ	<0.6 UJ	38 J	22 J	56	8.3 J	0.094 J	<1.2 UJ	53 J	<2.4 UJ	<1.2 UJ	38	<1.2 UJ	40	68 J

Table 2-2a
South Valley Remediation Area - Demolition Site 1
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
SS-1DSW-017		11/12/03	<2.599 R	7.5 J	210	<0.649 UJ	<0.649 UJ	28 J	12 J	43	7 J	<0.064	<1.299 UJ	32 J	<2.599 UJ	<1.299 UJ	72	<1.299 UJ	53	52 J
SS-1DSW-018		11/12/03	<2.5 R	11 J	140	<0.62 UJ	<0.62 UJ	38 J	14 J	54	6.8 J	0.11 J	<1.2 UJ	50 J	<2.5 UJ	<1.2 UJ	72	<1.2 UJ	39	61 J
SS-1DSW-019		11/12/03	<2.599 R	7.9 J	120	<0.649 UJ	<0.649 UJ	32 J	15 J	49	6.5 J	0.091 J	<1.299 UJ	42 J	<2.599 UJ	<1.299 UJ	50	<1.299 UJ	34	60 J

Notes:
CAM 17 metals analyzed using EPA Method 6010B/7471A.

1 "Yes" indicates that the sample was removed by further excavation.

2 Sample SS-1DSI-005-001 was not analyzed for metals other than mercury because of insufficient sample.

J The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.

UJ The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.

mg/kg milligrams per kilogram

NA Not Analyzed.

R Data rejected based on QC exceedances (see Appendix D for data validation results).

Sample IDs: SS-1DBE-002-001 denotes a surface soil confirmation sample; -1DBE is a location identifier indicating the sample was collected from the Demo Site 1, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-1DSW-507 is a split duplicate sample.

Table 2-2b

South Valley Remediation Area - Demolition Site 1

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
Confirmation Samples			
SS-1DBE-004		11/11/03	<0.059
SS-1DBE-010		11/11/03	<0.068
SS-1DBE-510		11/11/03	<0.072

Notes:

mg/kg milligrams per kilogram

Sample IDs: SS-1DBE-002-001 denotes a surface soil confirmation sample; -1DBE is a location identifier indicating the sample was collected from the Demo Site, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-1DBE-510 is a split duplicate sample.

Table 2-2c
South Valley Remediation Area - Demolition Site 1
PAH Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	PAHs															
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
Human Health Screening Criteria			2,600		22,000	0.62	0.062	0.62	2,300	0.61	6.1	0.062	2300	1,800	0.62	56	22000	2,300
Investigation Samples																		
SB-1DSI-001-001		9/17/03	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.04	<0.04	<0.04	<0.04	<0.04	<0.2	<0.04	<0.04
SB-1DSI-001-003		9/17/03	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.04	<0.04	<0.04	<0.04	<0.04	<0.2	<0.04	<0.04
SB-1DSI-001-005		9/17/03	<0.25	<0.25	<0.025	<0.025	<0.025	<0.025	<0.051	<0.025	<0.051	<0.051	<0.051	<0.051	<0.051	<0.25	<0.051	<0.051
SB-1DSI-002-001	Yes	9/17/03	<0.23	<0.23	<0.023	<0.023	<0.023	<0.023	<0.045	<0.023	<0.045	<0.045	<0.045	<0.045	<0.045	<0.23	<0.045	<0.045
SB-1DSI-002-003	Yes	9/17/03	<0.24	<0.24	<0.024	<0.024	<0.024	<0.024	<0.048	<0.024	<0.048	<0.048	<0.048	<0.048	<0.048	<0.24	<0.048	<0.048
SB-1DSI-002-503	Yes	9/17/03	<0.24	<0.24	<0.024	<0.024	<0.024	<0.024	<0.047	<0.024	<0.047	<0.047	<0.047	<0.047	<0.047	<0.24	<0.047	<0.047
SB-1DSI-002-005	Yes	9/17/03	<0.24	<0.24	<0.024	<0.024	<0.024	<0.024	<0.048	<0.024	<0.048	<0.048	<0.048	<0.048	<0.048	<0.24	<0.048	<0.048
SB-1DSI-003-001		9/17/03	<0.22	<0.22	<0.022	<0.022	<0.022	<0.022	<0.044	<0.022	<0.044	<0.044	<0.044	<0.044	<0.044	<0.22	<0.044	<0.044
SB-1DSI-003-003		9/17/03	<0.23	<0.23	<0.023	<0.023	<0.023	<0.023	<0.047	<0.023	<0.047	<0.047	<0.047	<0.047	<0.047	<0.23	<0.047	<0.047
SB-1DSI-003-005		9/17/03	<0.22	<0.22	<0.022	<0.022	<0.022	<0.022	<0.044	<0.022	<0.044	<0.044	<0.044	<0.044	<0.044	<0.22	<0.044	<0.044
SB-1DSI-004-001	Yes	9/17/03	<0.22	<0.22	<0.022	<0.022	<0.022	<0.022	<0.045	<0.022	<0.045	<0.045	<0.045	<0.045	<0.045	<0.22	<0.045	<0.045
SB-1DSI-005-001	Yes	9/17/03	<0.27	<0.27	<0.027	<0.027	<0.027	<0.027	<0.055	<0.027	<0.055	<0.055	<0.055	<0.055	<0.055	<0.27	<0.055	<0.055
SB-1DSI-005-501	Yes	9/17/03	<0.23	<0.23	<0.023	<0.023	<0.023	<0.023	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.23	<0.045	<0.045
SB-1DSI-005-003	Yes	9/17/03	<0.24	<0.24	<0.024	<0.024	<0.024	<0.024	<0.047	<0.024	<0.047	<0.047	<0.047	<0.047	<0.047	<0.24	<0.047	<0.047
SB-1DSI-006-001	Yes	9/17/03	<0.23	<0.23	<0.023	<0.023	<0.023	<0.023	<0.046	<0.023	<0.046	<0.046	<0.046	<0.046	<0.046	<0.23	<0.046	<0.046
SB-1DSI-006-003	Yes	9/17/03	<0.24	<0.24	<0.024	<0.024	<0.024	<0.024	<0.047	<0.024	<0.047	<0.047	<0.047	<0.047	<0.047	<0.24	<0.047	<0.047
Confirmation Samples																		
SS-1DBE-004		11/11/03	<0.012	<0.012	<0.006	<0.006	<0.006	<0.006	<0.012	<0.006	<0.006	<0.012	<0.006	<0.006	<0.012	<0.024	<0.006	<0.006
SS-1DBE-010		11/11/03	<0.013 UJ	<0.013 UJ	<0.006 UJ	<0.006 UJ	<0.006 UJ	<0.006 UJ	<0.013 UJ	<0.006 UJ	<0.006 UJ	<0.013 UJ	<0.006 UJ	<0.006 UJ	<0.013 UJ	<0.027 UJ	<0.006 UJ	<0.006 UJ
SS-1DBE-510		11/11/03	<0.014	<0.014	<0.006	<0.006	<0.006	<0.006	<0.014	<0.006	<0.006	<0.014	<0.006	<0.006	<0.014	<0.028	<0.006	<0.006

Notes:

1	"Yes" indicates that the sample was removed by further excavation.
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
PAHs	Polynuclear aromatic hydrocarbons analyzed using method EPA 8310.
mg/kg	milligram per kilogram
Sample IDs:	SS-1DBE-002-001 denotes a surface soil confirmation sample; -1DBE is a location identifier indicating the sample was collected from the Demo Site, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SB-1DSI-002-503 is a split duplicate sample.

Table 2-2d
South Valley Remediation Area - Demolition Site 1
Explosives Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	DateSampled	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	HMX	Nitrobenzene	Nitroglycerin	PETN	RDX	Tetryl
Human Health Screening Criteria			1,800	6.1	16	0.72	0.02	16	370	370	16	370		20	35		4	61
Investigation Samples																		
SB-1DSI-001-001		9/17/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-001-003		9/17/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-001-005		9/17/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-002-001	Yes	9/17/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-002-003	Yes	9/17/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-002-503	Yes	9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-002-005	Yes	9/17/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-003-001		9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-003-003		9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-003-005		9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-004-001	Yes	9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-005-001	Yes	9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-005-501	Yes	9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-005-003	Yes	9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-006-001	Yes	9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
SB-1DSI-006-003	Yes	9/17/03	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<5	<4	<0.25	<0.5
Confirmation Samples																		
SS-1DBE-004		11/11/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-1DBE-010		11/11/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-1DBE-510		11/11/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25

Notes:

1 "Yes" indicates that the sample was removed by further excavation.

UJ The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.

mg/kg milligram per kilogram

Sample IDs: SS-1DBE-002-001 denotes a surface soil confirmation sample; -1DBE is a location identifier indicating the sample was collected from the Demo Site, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SB-1DSI-005-501 is a split duplicate sample.

Table 2-2e
South Valley Remediation Area - Demolition Site 1
Dioxin and Furan Analytical Results
(concentrations expressed in pg/g)

Sample ID	Soil Removed by Excavation[1]	Sample Date	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF	TEQ
Preliminary Soil Remediation Goa																				12
Investigation Samples																				
SB-1DSI-001-001		9/17/03	<0.899	<0.529	<0.629	<0.579	<0.349	<0.479	<0.3	<0.509	<0.409	<0.72	<0.4	<0.36	<0.4	<0.31	<0.419	<5.3	<1.7	0.62
SB-1DSI-006-003	Yes	9/17/03	<1.6	<1	<0.46	<0.409	<0.66	<0.379	<0.25	<0.36	<0.3	<0.589	<0.409	<0.56	<0.589	<0.259	0.76	6.8	<1.1	0.68
Confirmation Samples																				
SS-1DBE-004		11/11/03	<0.73	<1.5	<0.589	<0.62	<0.56	<0.589	<0.519	<0.579	<0.629	<0.98	<0.62	<0.579	<0.62	<0.5	<0.33	<0.939	<1.399	0.89
SS-1DBE-010		11/11/03	<0.899	<0.579	<0.68	<0.55	<0.54	<0.54	<0.509	<0.509	<0.62	<1.2	<0.639	<0.569	<0.62	<0.529	<0.3	<0.93	<0.98	0.95
SS-1DBE-510		11/11/03	<0.819	<0.66	<0.62	<0.529	<0.469	<0.509	<0.439	<0.5	<0.529	<1.2	<0.62	<0.479	<0.62	<0.629	<0.289	<1.5	<0.949	0.97

Notes:
Dioxins/furans analyzed using EPA method 8290.

1 "Yes" indicates that the sample was removed by further excavation.

2 The preliminary soil remediation goal for dioxins is expressed in terms of 2,3,7,8-TCDD toxicity equivalence (TEQ).

pg/g picograms per gram

Sample IDs: SS-1DBE-010 denotes a surface soil confirmation sample; -1DBE is a location identifier indicating the sample was collected from the Demo Site 1, bottom of excavation; SI denotes soil investigation; and -010 is the location number. SS-1DBE-510 is a split duplicate sample. For SB-1DSI-006-003, -003 indicates the sample was collected 3 feet below the original excavation surface after an additioal 3-feet lift of soil was removed. SS-1DBE-510 is a split duplicale sample.

Table 2-3a
South Valley Remediation Area - Demolition Site 3
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
Preliminary Soil Remediation Goals												0.77								
Investigation Samples																				
SB-3DSI-I01-000.5	Yes	7/14/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.74	NA	NA	NA	NA	NA	NA	NA	NA
SB-3DSI-I01-001	Yes	7/14/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8	NA	NA	NA	NA	NA	NA	NA	NA
SB-3DSI-I01-001.5	Yes	7/14/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2	NA	NA	NA	NA	NA	NA	NA	NA
SB-3DSI-K01-000.5	Yes	7/14/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
SB-3DSI-K01-001	Yes	7/14/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.87	NA	NA	NA	NA	NA	NA	NA	NA
SB-3DSI-K01-001.5	Yes	7/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	12	NA	NA	NA	NA	NA	NA	NA	NA
SB-3DSI-K01-002	Yes	7/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.55	NA	NA	NA	NA	NA	NA	NA	NA
SS-SWBP-018	Yes	9/25/2002	<2 UJ	8.8	94	<0.5	3.2	30	11	450	89 J	0.25	<1	40	<2	<1		2.6	39	76 J
SS-SWBP-020	Yes	10/3/2002	<2	5	120	<0.5	3.2	22	10	1100	510	41	<1	27	2.2	<1		3	41	91
SS-SWBP-021	Yes	10/15/2002	<2	5.3	77	<0.5	2.4	27	12	3200	510	29	<1	42	2.3	<1		1.3	38	83
SS-SWBP-022	Yes	10/15/2002	2.2	7.1	150	<0.5	3.7	25	12	150	38	50	<1	24	<2	<1		3.2	60	90
SS-SWBP-023	Yes	10/15/2002	2	4.3	140	<0.5	2.9	25	12	89	35	9.3	<1	31	2	<1		3	44	69
SS-SWBP-024	Yes	10/17/2002	<2	6.2	90	<0.5	3.5	26	11	340	100	0.38 J	<1	34	<2	<1		2.3	45	100
SS-SWBP-025	Yes	10/28/2002	<2 UJ	5.4	48	<0.5	6.3	35	11	4000	700	<0.05	<1	47	3.3	<1		1.2	30	100 J
SS-SWBP-026	Yes	12/5/2002	<2.4 UJ	89 J	150 J	<0.589 UJ	<0.589 UJ	33 J	15 J	1100	170 J	3.6	<1.2 UJ	36 J	2.8 J	<1.2 UJ		<1.2 UJ	60 J	88 J
SS-SWBP-027	Yes	1/8/2003	1.1 J	15.9	297	0.62	0.53	54.2 J	20	232	119 J	45.7	0.55 J1	47.8	2 J1	0.13 J1		<1.2	108 J	98.3 J
SS-SWBP-028*	Yes	1/8/2003	0.66 J	16.5	293	0.59	0.73	53.7 J	21.9	116	1840 J	18.4	0.73 J1	50.2	<2.299	0.22 J1		<1.2	113 J	108 J
SS-SWBP-29	Yes	2/17/2003	0.97 J	13.7 J	265	0.59 J	0.88 J	48.7	16.6 J	91 J	63.2 J	45	<2.4 UJ	40.4 J	0.56 J	<0.6 J		0.6 J	100	98.4 J

Table 2-3a
South Valley Remediation Area - Demolition Site 3
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
Preliminary Soil Remediation Goals												0.77								
Confirmation Samples																				
SS-3DBE-001		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-002		9/12/2003	<2.099 R	6.5 J	230 J	0.3 J	0.6 J	28 J	8.5 J	33 J	2.9 J	<0.052	<1.1 UJ	22 J	1.7 J	<1.1 UJ	NA	<1.1 UJ	69 J	42 J
SS-3DBE-003		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-004		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-005		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-006		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-007		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-008		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-009		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.095	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-010		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-011		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-012		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.16	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-013		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.56	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-014		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.22	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-015		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.09	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-016		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-017		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.089	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-018		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-019		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.083	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-020		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.091	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-021		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.45	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-022		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.069	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-023		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.063	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-024		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-025		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-026		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.57	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-027		9/12/2003	<2.2 R	7.1 J	170 J	0.29 J	0.64 J	27 J	7.4 J	34 J	4.8 J	0.062	<1.1 UJ	20 J	1.3 J	<1.1 UJ	NA	<1.1 UJ	68 J	42 J
SS-3DBE-028		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-029		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-030		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.06	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-031		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.14	NA	NA	NA	NA	NA	NA	NA	NA

Table 2-3a
South Valley Remediation Area - Demolition Site 3
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
Preliminary Soil Remediation Goals												0.77								
SS-3DBE-032		9/12/2003	<2.099 R	8.5 J	210 J	0.37 J	0.67 J	31 J	8.5 J	36 J	5.4 J	<0.054	<1.1 UJ	25 J	1.6 J	<1.1 UJ	NA	<1.1 UJ	68 J	45 J
SS-3DBE-033		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-034		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.18	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-035		9/12/2003	<2.099 R	5.5 J	130 J	0.19 J	0.63 J	22 J	9.1 J	30 J	8.6 J	0.21	<1 UJ	16 J	1.3 J	0.027 J	NA	<1 UJ	63 J	42 J
SS-3DBE-036		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-037		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.13	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-038		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.06	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-039		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.053	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-040		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-041		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.91	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-042		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.066	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-043		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-044		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-045		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.17	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-046		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.089	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-047		9/15/2003	<2.299 R	8.5 J	250 J	0.34 J	0.71 J	38 J	14 J	60 J	7 J	0.072	<1.1 UJ	48 J	1.7 J	<1.1 UJ	NA	<1.1 UJ	47 J	74 J
SS-3DBE-048		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-049		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.057	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-050		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.056	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-051		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.077	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-052		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.088	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-053		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.19	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-054		9/12/2003	<2.099 R	4.2 J	120 J	0.16 J	0.39 J	19 J	7.7 J	24 J	2.8 J	<0.052	<1.1 UJ	12 J	1.5 J	<1.1 UJ	NA	<1.1 UJ	62 J	36 J
SS-3DBE-055		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-056		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.082	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-056		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-058		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-059		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.16	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-060		9/12/2003	<2.2 R	13 J	130 J	0.29 J	0.52 J	32 J	15 J	42 J	4.5 J	0.1	<1.1 UJ	28 J	1.2 J	<1.1 UJ	NA	<1.1 UJ	58 J	58 J
SS-3DBE-061		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.083	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-062		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.12	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-063		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8	NA	NA	NA	NA	NA	NA	NA	NA

Table 2-3a
South Valley Remediation Area - Demolition Site 3
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
Preliminary Soil Remediation Goals												0.77								
SS-3DBE-064		9/15/2003	<2.2 R	8.8 J	220 J	0.57 J	0.61 J	36 J	15 J	51 J	10 J	0.19	0.11 J	48 J	0.42 J	0.25 J	NA	<1.1 UJ	48 J	63 J
SS-3DBE-066		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-067		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-068		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-069		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.82**	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-070		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.36	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-071		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.6**	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-072		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.2**	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-073		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.26	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-077		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.054	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-078		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.12	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-079		9/15/2003	<2.2 R	8.8 J	180 J	0.47 J	0.69 J	34 J	11 J	120 J	10 J	<0.056	0.034 J	36 J	0.46 J	0.078 J	NA	<1.1 UJ	52 J	190 J
SB-3DSI-079-001		10/23/2003	0.29 J1	9.2	190	0.46 J1	0.79	33	15	270	27	0.17	0.39 J1	41	1.5 J1	0.31 J1	41	<1.1	51	570
SB-3DSI-079-101		10/23/2003	0.53 J1	9.4	180	0.49 J1	0.84	36	15	290	27	0.15	0.36 J1	41	0.68 J1	0.27 J1	40	0.95 J1	54	630
SS-3DBE-080		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.085	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-081		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.4**	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-082		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.12	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-083		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.4**	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-084		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.36	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-508*		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.49	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-516*		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.056	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-530*		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.056	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-547*		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.062	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-560*		9/12/2003	<2.2 R	11 J	130 J	0.28 J	0.48 J	30 J	13 J	39 J	4.2 J	0.065	<1.1 UJ	27 J	2.3 J	<1.1 UJ	NA	<1.1 UJ	62 J	57 J
SS-3DBE-564*		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.084	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-573*		9/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.34	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DBE-580*		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.099	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DSI-079-002		11/11/2003	NA	NA	NA	NA	NA	NA	NA	380	NA		NA	NA	NA	NA	NA	NA	NA	620
SS-3DSW-027		9/16/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3**	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DSW-028		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.07	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DSW-029		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**4.3**	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DSW-035		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA

Table 2-3a
South Valley Remediation Area - Demolition Site 3
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
Preliminary Soil Remediation Goals												0.77								
SS-3DSW-039		9/15/2003	<2.2 R	6.5 J	91 J	0.26 J	0.64 J	26 J	9.1 J	34 J	2.5 J	<0.056	<1.1 UJ	18 J	1.9 J	<1.1 UJ		<1.1 UJ	73 J	48 J
SS-3DSW-045		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.069	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DSW-057		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.052	NA	NA	NA	NA	NA	NA	NA	NA
SS-3DSW-527		9/15/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.97**	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screenign criteria are shown in bold type.
CAM 17 metals analyzed using EPA Method 6010B/7471A.

[1]	"Yes" indicates that the sample was removed by further excavation.
J	The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
J1	The concentration is approximate because it is less than the reporting limit.
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
mg/kg	milligrams per kilogram
NA	Not analyzed. Note: Only 10% of the samples required full metals analysis.
Sample IDs:	SS-3DBE-002-001 denotes a surface soil confirmation sample; -3DBE is a location identifier indicating the sample was collected from the Demo Site 3, bottom of excavation; SW denotes sidewall; BP was collected from a Blow-In-Place location; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-3DBE-018-501 is a split duplicate sample.

* SS-SWBP-028 is a duplicate of SS-SWBP-02
SS-3DBE-508 is a duplicate of SS-3DBE-008.
SS-3DBE-516 is a duplicate of SS-3DBE-016.
SS-3DBE-530 is a duplicate of SS-3DBE-030.
SS-3DBE-547 is a duplicate of SS-3DBE-047.
SS-3DBE-560 is a duplicate of SS-3DBE-060.
SS-3DBE-564 is a duplicate of SS-3DBE-064.
SS-3DBE-573 is a duplicate of SS-3DBE-074.
SS-3DBE-580 is a duplicate of SS-3DBE-080.

Table 2-3b

South Valley Remediation Area - Demolition Site 3

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
Confirmation Samples			
SS-3DBE-001		9/12/2003	<0.054
SS-3DBE-002		9/12/2003	<0.052
SS-3DBE-003		9/12/2003	<0.052
SS-3DBE-004		9/12/2003	<0.052
SS-3DBE-005		9/12/2003	<0.054
SS-3DBE-006		9/12/2003	<0.052
SS-3DBE-007		9/12/2003	<0.052
SS-3DBE-008		9/12/2003	<0.052
SS-3DBE-508		9/12/2003	<0.05
SS-3DBE-009		9/12/2003	<0.052
SS-3DBE-010		9/12/2003	<0.052
SS-3DBE-011		9/12/2003	<0.052
SS-3DBE-012		9/12/2003	<0.052
SS-3DBE-013		9/12/2003	<0.052
SS-3DBE-014		9/12/2003	<0.052
SS-3DBE-015		9/12/2003	<0.052
SS-3DBE-016		9/12/2003	<0.052
SS-3DBE-516		9/12/2003	<0.05
SS-3DBE-017		9/12/2003	<0.054
SS-3DBE-018		9/12/2003	<0.052
SS-3DBE-019		9/12/2003	<0.052
SS-3DBE-020		9/12/2003	<0.05
SS-3DBE-021		9/12/2003	<0.052
SS-3DBE-022		9/12/2003	<0.054
SS-3DBE-023		9/12/2003	<0.054
SS-3DBE-024		9/12/2003	<0.1
SS-3DBE-025		9/12/2003	<0.052
SS-3DBE-026		9/12/2003	<0.052
SS-3DBE-027		9/12/2003	<0.054

Table 2-3b

South Valley Remediation Area - Demolition Site 3

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
SS-3DBE-028		9/12/2003	<0.052
SS-3DBE-029		9/12/2003	<0.054
SS-3DBE-030		9/12/2003	<0.054
SS-3DBE-530		9/12/2003	<0.052
SS-3DBE-031		9/12/2003	<0.054
SS-3DBE-032		9/12/2003	<0.054
SS-3DBE-033		9/12/2003	<0.052
SS-3DBE-034		9/12/2003	<0.052
SS-3DBE-035		9/12/2003	<0.052
SS-3DBE-036		9/15/2003	<0.054
SS-3DBE-037		9/15/2003	<0.057
SS-3DBE-038		9/15/2003	<0.061
SS-3DBE-039		9/12/2003	<0.054
SS-3DBE-040		9/12/2003	<0.052
SS-3DBE-041		9/12/2003	<0.052
SS-3DBE-042		9/12/2003	<0.054
SS-3DBE-043		9/12/2003	<0.052
SS-3DBE-044		9/12/2003	<0.052
SS-3DBE-045		9/12/2003	<0.052
SS-3DBE-046		9/15/2003	<0.057
SS-3DBE-047		9/15/2003	<0.057
SS-3DBE-547		9/15/2003	<0.056
SS-3DBE-048		9/15/2003	<0.054
SS-3DBE-049		9/15/2003	<0.059
SS-3DBE-050		9/15/2003	<0.057
SS-3DBE-051		9/15/2003	<0.057
SS-3DBE-052		9/15/2003	<0.057
SS-3DBE-053		9/15/2003	<0.056
SS-3DBE-054		9/12/2003	<0.052
SS-3DBE-055		9/12/2003	<0.052

Table 2-3b

South Valley Remediation Area - Demolition Site 3

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
SS-3DBE-555		9/12/2003	<0.052
SS-3DBE-056		9/12/2003	<0.05
SS-3DBE-056		9/15/2003	<0.052
SS-3DBE-058		9/15/2003	<0.054
SS-3DBE-059		9/12/2003	<0.056
SS-3DBE-060		9/12/2003	<0.054
SS-3DBE-560		9/12/2003	<0.054
SS-3DBE-061		9/12/2003	<0.052
SS-3DBE-062		9/12/2003	<0.056
SS-3DBE-063		9/12/2003	<0.054
SS-3DBE-064		9/15/2003	<0.056
SS-3DBE-564		9/15/2003	<0.056
SS-3DBE-066		9/15/2003	<0.052
SS-3DBE-067		9/15/2003	<0.054
SS-3DBE-068		9/15/2003	<0.052
SS-3DBE-069		9/15/2003	<0.054
SS-3DBE-070		9/15/2003	<0.054
SS-3DBE-071		9/15/2003	<0.059
SS-3DBE-072		9/12/2003	<0.052
SS-3DBE-073		9/12/2003	<0.056
SS-3DBE-573		9/12/2003	<0.056
SS-3DBE-077		9/15/2003	<0.056
SS-3DBE-078		9/15/2003	<0.056
SS-3DBE-079		9/15/2003	<0.056
SS-3DBE-080		9/15/2003	<0.057
SS-3DBE-580		9/15/2003	<0.057
SS-3DBE-081		9/15/2003	<0.054
SS-3DBE-082		9/12/2003	<0.054
SS-3DBE-083		9/15/2003	<0.054
SS-3DBE-084		9/12/2003	<0.052

Table 2-3b

South Valley Remediation Area - Demolition Site 3

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
SS-3DSW-027		9/15/2003	<0.052
SS-3DSW-527		9/15/2003	<0.052
SS-3DSW-028		9/15/2003	<0.052
SS-3DSW-029		9/15/2003	<0.056
SS-3DSW-035		9/15/2003	<0.052
SS-3DSW-039		9/15/2003	<0.056
SS-3DSW-045		9/15/2003	<0.054
SS-3DSW-057		9/15/2003	<0.052

Notes:

mg/kg milligrams per kilogram

Sample IDs: SS-3DBE-002-001 denotes a surface soil confirmation sample; -3DBE is a location identifier indicating the sample was collected from the Demo Site 3, bottom of excavation; SW denotes sidewall; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-3DBE-508 is a split duplicate sample.

Table 2-3c
Demolition Site 3
Explosives Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed for Excavation[1]	Sample Date	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	HMX	Nitrobenzene	Nitroglycerin	PETN	RDX	Tetryl
Human Health Screening Criteria			1,800	6.1	16	0.72	0.02	16	370	370	16	370		20	35			61
Preliminary Soil Remediation Goal[2]					53		0.5											
Investigation Samples																		
SS-SWBP-018	Yes	8/25/2002	<0.25 UJ	<0.25	7.7	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-SWBP-020	Yes	10/3/2002	<0.25	<0.25	3.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	1.9	<0.25	<0.25
SS-SWBP-021	Yes	10/15/2002	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	0.53 J
SS-SWBP-022	Yes	10/15/2002	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-SWBP-023	Yes	10/15/2002	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-SWBP-024	Yes	10/17/2002	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-SWBP-025	Yes	10/28/2002	<2.5	<2.5	**33**	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5	<5	<2.5	<2.5
SS-SWBP-026	Yes	12/5/2002	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-SWBP-027	Yes	1/8/2003	<0.25	<0.25	<0.25 UJ	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.57	<0.5	<0.25	1.8 J
SS-SWBP-028	Yes	1/8/2003	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	0.2
SS-SWBP-29	Yes	2/17/2003	<0.25	<0.25	12	<0.25	<0.25	<0.25	<0.25	<0.25	<1	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screenign criteria are shown in **bold** type.
CAM 17 metals analyzed using EPA Method 6010B/7471A.

1 "Yes" indicates that the sample was removed by further excavation.
2 Preliminary remediation goals set for explosives in open space areas of the TNT Strips
J The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
UJ The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
mg/kg milligrams per kilogram
Sample IDs: SS-SWBP-018 denotes a surface soil confirmation sample; -SWBP is a location identifier indicating a sidewall Blow-In-Place sample.

Table 2-3d
South Valley Remediation Area - Demolition Site 3
Dioxin and Furan Analytical Results
(concentrations expressed in pg/g)

Sample ID	Soil Removed by Excavation	Sample Date	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF	TEQ
Preliminary Soil Remediation Goal[1]																				12
Confirmation Samples																				
SS-3DBE-001		9/12/2003	<0.55	<0.36	<0.419	<0.649	<0.36	<0.529	<0.3	<0.55	<0.419	<0.68	<0.409	<0.379	<0.409	<0.34	<0.289	<0.589	<0.689	0.63
SS-3DBE-009		9/12/2003	<2.099	<0.6	<0.72	<1.1	<0.689	<0.949	<0.579	<0.99	<0.8	<1.5	<0.839	<0.72	<0.85	<0.75	<0.509	16	<1.2	1.3
SS-3DBE-021		9/12/2003	50	<1.899	<0.98	<1.799	<1.2	<1.6	<1	<2.099	<1.399	<2.2	<1.1	<1.299	<1.1	<0.92	<0.529	330	11	2.7
SS-3DBE-036		9/15/2003	<0.18	<0.097	<0.109	<0.15	<0.09	<0.15	<0.089	<0.14	<0.093	<0.219	<0.159	<0.09	<0.159	<0.1	<0.18	<1.299	<0.189	0.2
SS-3DBE-039		9/12/2003	<0.99	<0.66	<0.779	<0.86	<0.54	<0.709	<0.46	<0.74	<0.639	<1.399	<0.68	<0.56	<0.66	<0.55	<0.419	<2.099	<1.2	1.1
SS-3DBE-055		9/12/2003	<1.299	<0.72	<0.85	<1.399	<0.759	<1.1	<0.639	<1.2	<0.899	<1.899	<0.98	<0.79	<0.98	<0.81	<0.569	<1.399	<1.6	0.55
SS-3DBE-071		9/15/2003	37	<2.2	<0.189	<0.259	<0.15	<0.759	<0.119	<0.629	<0.31	<0.529	<0.28	<0.119	<0.28	<0.189	<0.319	290	9.3	1.1
SS-3DBE-072		9/12/2003	4.7	<0.79	<0.34	<0.54	<0.349	<0.449	<0.289	<0.46	<0.4	<0.829	<0.46	<0.36	<0.46	<0.319	<0.419	33	<2.099	0.75
SS-3DBE-077		9/15/2003	<0.159	<0.16	<0.2	<0.219	<0.1	<0.219	<0.098	<0.209	<0.109	<0.37	<0.23	<0.1	<0.23	<0.17	<0.239	<0.56	<0.27	0.31
SS-3DSW-057		9/15/2003	<0.379	<0.119	<0.09	<0.14	<0.072	<0.37	<0.064	<0.439	<0.409	<0.28	<0.189	<0.068	<0.189	<0.119	<0.17	<1.299	<0.15	0.27

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in bold type.
Dioxins/furans analyzed using EPA method 8290.

[1] The preliminary soil remediation goal for dioxins is expressed in terms of 2,3,7,8-TCDD toxicity equivalence (TEQ).

pg/g picograms per gram

Sample IDs: SS-3DBE-002-001 denotes a surface soil confirmation sample; -3DBE is a location identifier indicating the sample was collected from the Demo Site 3, bottom of excavation; SW denotes sidewall; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed.

Table 2-4a
South Valley - Flare Site 3
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Wetland	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria				31	18.2	5400	150	9	210	4700	2900	400	390	150	390	390	45000	5.2	550	23000
Preliminary Soil Remediation Goals				2.84		642					87.7	148								142
Investigation Samples																				
SS-SVF3-003	Yes	Yes	11/14/02	<2.599 R	10	530	<0.639	4.1 J	31 J	13	64	67	<1.299	27 J	<2.599	<1.299	NA	<1.299	67	200
SS-SVF3-004	Yes	Yes	11/14/02	**360 J**	<13	**2800**	<6.599	**210 J**	190 J	31	**4100**	**18000**	<13	**210 J**	<26	<13	NA	<13	31	5600
SB-SVF3-001-001	Yes	Yes	6/12/03	1.5 J	12.2	336 J	0.48 J	0.28	43.6 J	14.8	58.4 J	27.1 J	0.45 J1	34.5	0.96 J1	<0.66	NA	0.62 J1	97.2	86.3 J
SB-SVF3-002-001	Yes	Yes	6/12/03	**4.8 J**	14.3	299 J	0.5 J	2.5	50.5 J	16.7	**142 J**	**235 J**	0.77 J1	43.5	<2.599	<0.639	NA	0.88 J1	95.4	**185 J**
SB-SVF3-003-001	Yes	Yes	6/12/03	1.4 J	11.5	252 J	0.47 J	0.11 J1	43.3 J	16.7	51.2 J	8.5 J	0.65 J1	40.1	0.59 J1	<0.629	NA	0.73 J1	81.7	71.8 J
SB-SVF3-004-001	Yes	Yes	6/12/03	1.2 J	12	250 J	0.45 J	0.18 J1	39.1 J	17	49.1 J	15.2 J	0.46 J1	32.9	<2.299	<0.56	NA	0.47 J1	86.6	73.8 J
SB-SVF3-005-001	Yes	Yes	6/16/03	0.65 J	16.3	314	0.8	<0.239	62.7 J	25.2	73.9 J	22.9	1 J1	60.9	1.5 J1	<0.61	NA	0.62 J1	95.5 J	96.4
Confirmation Samples																				
SS-F3BE-001-000		Yes	10/28/03	<2.7 R	9.7 J	260 J	0.45 J	0.48 J	35 J	13 J	39 J	4.8 J	0.15 J	35 J	<2.7 J	0.24 J	NA	0.36 J	58 J	58 J
SS-F3BE-002-000		Yes	10/28/03	<2.599 R	10 J	200 J	0.31 J	0.49 J	28 J	14 J	30 J	5.7 J	0.31 J	24 J	<2.599 J	0.24 J	NA	<1.299 UJ	72 J	48 J
SS-F3BE-003-000		Yes	10/23/03	<2.599 UJ	5.8	120	0.39 J	0.2 J	28 J	11 J	42	4.5 J	0.13 J	26 J	2.3 J	0.12 J1	96	<1.299 UJ	49	51 J
SS-F3BE-004-000			10/28/03	<2.5 R	8.5 J	170 J	0.36 J	0.42 J	31 J	14 J	32 J	3.4 J	0.21 J	24 J	<2.5 J	0.21 J	NA	<1.2 UJ	73 J	44 J
SS-F3BE-005-000		Yes	10/23/03	<2.599 UJ	8.3	160	0.33 J	0.24 J	28 J	14 J	36	5.8 J	0.32 J	25 J	2.9 J	0.12 J1	66	<1.299 UJ	67	51 J
SS-F3BE-006-000			10/28/03	<2.299 R	11 J	160 J	0.33 J	0.3 J	32 J	14 J	40 J	4.4 J	0.22 J	25 J	0.34 J	0.17 J	NA	<1.1 UJ	66 J	52 J
SS-F3BE-007-000			10/28/03	<2.299 R	8.3 J	160 J	0.34 J	0.3 J	28 J	13 J	32 J	3.2 J	0.28 J	21 J	<2.299 J	0.19 J	NA	<1.1 UJ	70 J	43 J
SS-F3BE-007-500			10/28/03	<2.2 R	8.3 J	160 J	0.35 J	0.27 J	29 J	13 J	33 J	3.2 J	0.23 J	21 J	0.92 J	0.2 J	NA	<1.1 UJ	73 J	43 J
SS-F3SW-001-000		Yes	10/24/03	0.18 J	9.1	170	0.35 J	0.41 J	30 J	14 J	38	8.2 J	0.31 J	27 J	2.7 J	0.2 J1	47	<1.2 UJ	67	52 J
SS-F3SW-001-500		Yes	10/24/03	<2.5 UJ	9	180	0.36 J	0.23 J	32 J	14 J	38	4.8 J	0.35 J	28 J	2.2 J	0.21 J1	48	<1.2 UJ	67	55 J
SS-F3SW-002-000		Yes	10/24/03	<3.599 UJ	8.8	180	0.39 J	0.39 J	36 J	12 J	46	11 J	0.35 J	31 J	2 J	0.19 J1	73	<1.799 UJ	71	75 J
SS-F3SW-003-000		Yes	10/24/03	<4.9 UJ	5.5	170	0.41 J	0.47 J	37 J	13 J	51	13 J	0.4 J	34 J	2 J	0.26 J1	120	<2.4 UJ	71	110 J
SS-F3SW-004-000		Yes	10/24/03	<2.5 UJ	8	170	0.34 J	0.23 J	26 J	12 J	33	4.1 J	0.19 J	23 J	2.2 J	0.16 J1	73	<1.299 UJ	65	45 J
SS-F3SW-004-500		Yes	10/24/03	<2.5 UJ	8.3	180	0.36 J	0.23 J	26 J	13 J	33	3.8 J	0.21 J	23 J	2.4 J	0.16 J1	80	<1.2 UJ	66	45 J

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in **bold** type.

CAM 17 metals analyzed using EPA Method 6010B/7471A.

1 "Yes" indicates that the sample was removed by further excavation.

J The numerical value is the approximate concentration of the analyte in the sample. due to some type of QC exceedance.

J1 The concentration is approximate because it is less than the reporting limit.

UJ The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.

mg/kg milligrams per kilogram

NA Not analyzed.

Sample IDs: SS-F3BE-001-000 denotes a surface soil confirmation sample; -F3BE is a location identifier indicating the sample was collected from the Flare Site, bottom of excavation; F3 denotes Flare Site 3; SW denotes sidewall; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additional 1-foot lift of soil was removed. SS-F3SW-001-500 denotes a split duplicate sample.

Table 2-4b

South Valley - Flare Site 3

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Wetland	Soil Removed by Excavation[1]	Sample Date	Perchlorate
Human Health Screening Criteria				7.8
Preliminary Soil Remediation Goal[2]				
Investigation Samples				
SB-SVF3-001-001	Yes	Yes	6/12/03	<0.065
SB-SVF3-001-003.5	Yes	Yes	6/12/03	<0.063
SB-SVF3-002-001.0	Yes	Yes	6/12/03	<0.064
SB-SVF3-003-001	Yes	Yes	6/12/03	<0.063
SB-SVF3-003-003	Yes	Yes	6/12/03	<0.061
SB-SVF3-004-001	Yes	Yes	6/12/03	<0.057
SB-SVF3-004-002.5	Yes	Yes	6/12/03	<0.061
SB-SVF3-005-001.0	Yes	Yes	6/16/03	<0.059
SB-SVF3-005-003	Yes	Yes	6/16/03	<0.063
SB-SVF3-006-001	Yes	Yes	6/16/03	<0.059
SB-SVF3-007-001	Yes	Yes	6/16/03	<0.057
SB-SVF3-008-001.0	Yes	Yes	6/16/03	<0.063
SS-SVF3-003	Yes	Yes	11/14/02	<0.065
SS-SVF3-004	Yes	Yes	11/14/02	<0.075

Notes:

1 "Yes" indicates that the sample was removed by further excavation.

2 Preliminary soil remediation goals established in the Non-OE RDD for the North Valley stockpiles.

UJ The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.

mg/kg milligrams per kilogram

Sample IDs: SS-SVF3-002-001 denotes a surface soil confirmation sample; -SVF3 is a location identifier indicating the sample was collected from the South Valley Flare Site; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed.

Diesel and Motor oil by EPA Method 8015
Nitrat/nitrite by EPA Method 353
Perchlorate by EPA Method 314

Table 2-4c
South Valley - Flare Site 3
Dioxin and Furan Analytical Results
(concentrations expressed in pg/g)

Sample ID	Wetland	Soil Removed by Excavation[1]	Sample Date	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF	TEQ
Preliminary Soil Remediation Goal[2]																					12
Investigation Samples																					
SB-SVF3-001-001	Yes	Yes	6/12/03	<1 UJ	<0.79 UJ	<0.14 UJ	<0.159 UJ	<0.3 UJ	<0.25 UJ	<0.219 UJ	<0.319 UJ	<0.28 UJ	<0.109 UJ	<0.239 UJ	<0.239 UJ	<0.449 UJ	<0.059 UJ	<1.1 UJ	<4.5 UJ	<0.75 UJ	0.33
SB-SVF3-002-001	Yes	Yes	6/12/03	3.6 J	8.2 J	<1.299 UJ	<0.34 UJ	5 J	<0.8 UJ	3.7 J	<1.5 UJ	<0.34 UJ	<0.889 UJ	5.9 J	5.2 J	9.1 J	0.81 J	11 J	<6 UJ	<3.099 UJ	8.6
SB-SVF3-003-001	Yes	Yes	6/12/03	<0.119 UJ	<0.057 UJ	<0.039 UJ	<0.18 UJ	<0.075 UJ	<0.18 UJ	<0.071 UJ	<0.259 UJ	<0.23 UJ	<0.097 UJ	<0.065 UJ	<0.081 UJ	<0.061 UJ	<0.059 UJ	<0.057 UJ	<0.839 UJ	<0.119 UJ	0.13
SB-SVF3-004-001	Yes	Yes	6/12/03	<0.4 UJ	<0.239 UJ	<0.052 UJ	<0.159 UJ	<0.209 UJ	<0.2 UJ	<0.072 UJ	<0.349 UJ	<0.449 UJ	<0.086 UJ	<0.15 UJ	<0.076 UJ	<0.17 UJ	<0.052 UJ	<0.509 UJ	<1.799 UJ	<0.259 UJ	0.2
SB-SVF3-005-001	Yes	Yes	6/16/03	<0.15	<0.15	<0.061	<0.17	<0.18	<0.17	<0.072	<0.189	<0.28	<0.086	<0.119	<0.083	<0.159	<0.048	<0.97	<0.73	<0.159	0.2
SS-SVF3-003	Yes	Yes	11/14/02	3.5 J	<1.6 UJ	<0.98 UJ	<2.099 UJ	<2.099 UJ	<2.299 UJ	<2.099 UJ	<2.099 UJ	<2.7 UJ	<2.099 UJ	<2 UJ	<2.299 UJ	<2 UJ	<0.62 UJ	<1.299 UJ	15 J	<2.099 UJ	0.05
SS-SVF3-004	Yes	Yes	11/14/02	530 J	1300 J	130 J	67 J	640 J	120 J	550 J	120 J	41 J	140 J	680 J	930 J	1100 J	64 J	1200 J	600 J	290 J	**1150.29**
Confirmation Samples																					
SS-F3BE-001-000	Yes		10/28/03	<0.6	<0.4	<0.4	<0.409	<0.259	<0.4	<0.239	<0.379	<0.259	<0.829	<0.209	<0.239	<0.209	1.1	<0.28	<0.61	<0.56	1.5
SS-F3BE-003-000	Yes		10/23/03	<2.599	<3.599	<4	<2.599	<2.299	<2.4	<2.2	<2.299	<2.299	<1.6	<1	<2.2	<0.99	<0.86	<0.689	<5.4	<4.8	2
SS-F3BE-005-000	Yes		10/23/03	<5.4	<4.8	<5.4	<3.2	<2.299	<3	<2.2	<2.9	<2.299	<2.7	<1.5	<2.2	<1.5	<0.36	<0.99	30	<4.8	2.3
SS-F3BE-006-000			10/28/03	<2.599	<2	<2.2	<4.3	<3.2	<4.099	<3	<4	<3.2	<1.399	<0.67	<3.099	<0.66	<0.68	<0.569	<1.5	<1.399	2.2

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in **bold** type.
Dioxins/furans analyzed using EPA method 8290.
[1] "Yes" indicates that the sample was removed by further excavation.
[2] The preliminary soil Remediation goal for dioxins is expressed in terms of 2,3,7,8-TCDD toxicity equivalence (TEQ).
J The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
UJ The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
pg/g picograms per gram
Sample IDs: SS-SVF3-002-001 denotes a surface soil confirmation sample; -SVF3 is a location identifier indicating the sample was collected from the Flare Site 3, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed.

Table 2-5a
Ridge Area - Flare Site 2
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			76000	31	18.2	5400	150	9	210	4700	2900	400	390	150	390	390	45000	5.2	550	23000
Preliminary Soil Yesediation Goals				2.84		642					87.7	148								142
Investigation Samples																				
SS-RAF2-001,002,003,004	Yes	9/4/02	17000	<2	9	**2100**	0.51	3.8	35	14	54	21	<1	39	<2	<1	NA	4.7	52	**340**
SS-RAF2-005	Yes	9/4/02	**200000**	2.2	<1	**2900**	<0.5	**10**	67	4	**1700**	**210**	1.7	93	<2	<1	NA	**6.7**	18	**900**
Confirmation Samples																				
SS-F2BE-001-001		9/26/03	NA	<1.1	12	360	0.92	1.1	70	41	81	9.9	<2.2	76	<1.399	<1.1	36	<1.299	68	90
SS-F2BE-001-501		9/26/03	NA	<1.1	11	320	0.77	0.72	76	15	86	8.8	<2.2	71	<1.399	<1.1	35	<1.299	78	93
SS-F2BE-002-000-RS		10/20/03	23000	<2.5 R	9.9	240 J	0.66	1.1 J	45 J	22	65	13 J	<1.2 UJ	60 J	<2.5 UJ	<1.2	35	<1.2 UJ	44	78
SS-F2BE-002-001	Yes	9/26/03	NA	<1.1	14	**1100**	0.83	1	73	22	75	13	<2.2	64	<1.399	<1.1	40	<1.299	110	110
SS-F2BE-003-000		10/20/03	21000	<2.299 R	4.4	130 J	<0.56	0.97 J	41 J	17	66	7.1 J	<1.1 UJ	48 J	<2.299 UJ	<1.1	33	<1.1 UJ	45	78
SS-F2SW-001-001		9/26/03	NA	0.32 J1	16	**670**	0.86	0.21 J1	78	22	76	18	0.56 J1	66	<1.399	0.43 J1	30	<1.299	120	110
SS-F2SW-002-001	Yes	9/26/03	NA	<1.1	17	**840**	0.79	1.3	72	22	80	27	<2.2	63	<1.399	<1.1	31	<1.299	110	**200**
SS-F2SW-003-001	Yes	9/26/03	NA	<1.1	15	**760**	0.79	1.1	72	18	78	16	<2.099	58	<1.399	<1.1	29	<1.299	110	140
SS-F2SW-004-001	Yes	9/26/03	NA	<1.2	17	**2000**	0.81	1.4	73	23	85	26	<2.299	68	<1.5	<1.2	39	<1.399	110	**220**
SS-F2SW-005-000		10/20/03	23000	<2.2 R	8.2	390 J	0.64	0.91 J	41 J	17	53	12 J	<1.1 UJ	37 J	<2.2 UJ	<1.1	27	<1.1 UJ	62	67
SS-F2SW-006-000		10/20/03	22000	<2.299 R	8.2	260 J	0.59	0.95 J	41 J	24	54	10 J	<1.1 UJ	43 J	<2.299 UJ	<1.1	23	<1.1 UJ	61	64
SS-F2SW-007-000		10/20/03	21000	<2.2 R	9.4	410 J	0.59	1 J	39 J	16	54	13 J	<1.1 UJ	38 J	<2.2 UJ	<1.1	25	<1.1 UJ	61	72

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in **bold** type.
CAM 17 metals analyzed using EPA Method 6010B/7471A.
SS-RAF2-005 is a sample of granular flare residue.

[1]	"Yes" indicates that the sample was removed by further excavation.
J	The numerical value is the approximate concentration of the analyte in the sample, due to some type of QC exceedance.
J1	The concentration is approximate because it is less than the reporting limit.
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte
mg/kg	milligrams per kilogram
NA	Not analyzed.
R	Data rejected based on QC exceedances (see Appendix D for data validation results).
Sample IDs:	SS-F2BE-002-001 denotes a surface soil confirmation sample; -F2BE is a location identifier indicating the sample was collected from the Flare Site 2, bottom of excavation; SW indicates the sample was taken from the sidewall; -RAF2 indicates the sample was taken from the Flare Site 2 sector of the Ridge Area, -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-F2BE-001-501 is a split duplicate sample.

Table 2-5b

Ridge Area - Flare Site 2

Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Yesoved by Excavation[1]	Sample Date	Perchlorate
Human Health Screening Criteria			7.8
Investigation Sample			
SS-RAF2-001,002,003,004	Yes	9/4/2002	0.19 J1
Confirmation Samples			
SS-F2BE-001-001		9/26/2003	<0.011
SS-F2BE-001-501		9/26/2003	<0.011
SS-F2BE-002-000-RS		10/20/2003	<0.012
SS-F2BE-002-001	Yes	9/26/2003	<0.011
SS-F2BE-003-000-RS		10/20/2003	<0.011
SS-F2SW-001-001		9/26/2003	<0.011
SS-F2SW-002-001	Yes	9/26/2003	<0.011
SS-F2SW-003-001	Yes	9/26/2003	<0.011
SS-F2SW-004-001	Yes	9/26/2003	<0.012

Notes:

[1] "Yes" indicates that the sample was removed by further excavation.

J1 The concentration is approximate because it is less than the

mg/kg milligrams per kilogram

Sample IDs: SS-F2BE-002-001 denotes a surface soil confirmation sample; -F2BE is a location identifier indicating the sample was collected from the Flare Site 2, bottom of excavation; SW indicates the sample was taken from the sidewall; -RAF2 indicates the sample was taken from the Flare Site 2 sector of the Ridge Area, -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-F2BE-001-501 is a split duplicate sample.

Diesel and Motor oil by EPA Method 8015
Nitrate and nitrite by EPA Method 9056
Perchlorate by EPA Method 314

Table 2-5c
Ridge Area - Flare Site 2
Dioxin and Furan Analytical Results
(concentrations expressed in pg/g)

Sample ID	Soil Removed by Excavatio	Sample Date	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF	TEQ
Preliminary Soil Remediation Goal[2]																				12
Investigation Samples																				
SS-RAF2-001,002,003,004	Yes	09/04/02	7.6	4.8 J1	<0.079	<0.071	<0.15	<0.449	<0.061	<0.34	<0.18	<0.1	<0.1	<0.068	<0.093	<0.05	<0.4	100	<3.599	0.39
Confirmation Samples																				
SS-F2SW-004-001	Yes	09/26/03	3.7	<1.799	<0.259	<0.15	<0.17	<0.34	<0.17	<0.259	<0.18	<0.259	<0.17	<0.18	<0.17	<0.31	<0.389	27	<1.5	0.43

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in **bold** type.
Dioxins/furans analyzed using EPA method 8290.

[1] "Yes" indicates that the sample was removed by further excavation.
[2] The preliminary soil remediation goal for dioxins is expressed in terms of 2,3,7,8-TCDD toxicity equivalence (TEQ).
J1 The concentration is approximate because it is less than the reporting limit.
pg/g picograms per gram
Sample IDs: SS-F2SW-004-001 denotes a surface soil confirmation sample; -F2SW is a location identifier indicating the sample was collected from the Flare Site, sidewall; RA indicates the Ridge Area; -004 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed.

Table 2-6a
Ridge Area - Remediation Stockpile Footprint Samples
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavatio	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Vanadium	Zinc
Human Health Screening Criteria			31	18.2	5400	150	9	210	4700	2900	400	23	390	150	390	390	45000	5.2	550	23000
Flare Site 1 Stockpile Footprint																				
SS-F1SF-001		1/30/04	<2.5 R	12 J	170 J	<0.64 UJ	<0.64 UJ	36 J	14 J	53	8.1 J	0.075	<1.3 UJ	37 J	22	<1.3 UJ		<1.3 UJ	57 J	65 J
SS-F1SF-002		1/30/04	<2.3 R	3.7 J	180 J	<0.57 UJ	<0.57 UJ	48 J	12 J	58	6 J	<0.057	<1.1 UJ	43 J	<1.1 UJ	<1.1 UJ	24	<1.1 UJ	47 J	67 J
SS-F1SF-003		1/30/04	<2.3 R	13 J	110 J	<0.58 UJ	<0.58 UJ	29 J	20 J	42	5.2 J	<0.058	<1.2 UJ	23 J	<2.3 UJ	<1.2 UJ	13	<1.2 UJ	51 J	59 J
SS-F1SF-004		1/30/04	<2.4 R	3.8 J	180 J	<0.59 UJ	<0.59 UJ	41 J	11 J	58	6.1 J	<0.059	<1.2 UJ	40 J	<2.4 UJ	<1.2 UJ	18	<1.2 UJ	40 J	65 J
SS-F1SF-005		1/30/04	<2.2 R	11 J	110 J	<0.54 UJ	<0.54 UJ	23 J	16 J	31	3.6 J	<0.054	<1.1 UJ	16 J	<2.2 UJ	<1.1 UJ	13	<1.1 UJ	64 J	49 J
SS-F1SF-006		1/30/04	<2.3 R	8.7 J	110 J	<0.58 UJ	<0.58 UJ	33 J	13 J	56	4.1 J	<0.058	<1.2 UJ	27 J	<2.3 UJ	<1.2 UJ	30	<1.2 UJ	52 J	60 J
Flare Site 2 & 3 Stockpile Footprint																				
SS-F23SF-001		1/30/04	<2.3	15	35	<0.58	<0.58	37	9.5	63	6.6	0.072 J	<1.2	27	<2.3	<1.2		<1.2	54	58
Flare Site 2 Stockpile Footprint																				
SS-F2SF-001		1/30/04	<2.3 R	12 J	170 J	<0.58 UJ	<0.58 UJ	42 J	12 J	58	9.1 J	<0.058	<1.2 UJ	42 J	<2.3 UJ	<1.2 UJ		<1.2 UJ	39 J	84 J
Flare Site 3 Stockpile Footprint																				
SS-F3SF-001		1/30/04	<2.3 R	19 J	170 J	<0.57 UJ	<0.57 UJ	37 J	5 J	39	6.2 J	0.058	<1.1 UJ	35 J	<2.3 UJ	<1.1 UJ		<1.1 UJ	28 J	57 J
SS-F3SF-002		1/30/04	<2.3 R	7.1 J	180 J	0.62 J	<0.57 UJ	39 J	26 J	70	10 J	0.067	<1.1 UJ	60 J	<2.3 UJ	<1.1 UJ		<1.1 UJ	47 J	81 J
North Valley Area Stockpile Footprints																				
SS-RABE-008		1/30/04	<2.5	9.9	210	<0.63	<0.63	32	14	44	7.8	0.11 J	<1.3	34	<2.5	<1.3	NA	<1.3	60	58
SS-RABE-009-000		10/31/03	<2.3 R	8.8 J	140 J	0.23 J	0.34 J	25 J	10 J	29 J	3.8 J	0.057	0.18 J	24 J	0.49 J	0.21 J	NA	<1.2 UJ	73 J	52 J
SS-RABE-010-000		10/14/03	<2.1 R	8.2 J	170 J	0.36 J	<0.53 UJ	31 J	13 J	44	15 J	0.066	0.033 J	33 J	1.7 J	<1.1	NA	<1.1 UJ	51 J	56 J
SS-RABE-011-000		10/14/03	<2.2 R	7.8 J	170 J	0.41 J	<0.56 UJ	35 J	15 J	52	12 J	0.087	0.097 J	37 J	1.5 J	<1.1	NA	<1.1 UJ	49 J	64 J
SS-RABE-012-000		10/14/03	<2.2 R	9.8 J	170 J	0.4 J	<0.55 UJ	33 J	14 J	47	27 J	0.078	0.085 J	36 J	1.4 J	<1.1	NA	<1.1 UJ	51 J	61 J
SS-RABE-013-000		10/14/03	<2.3 R	8 J	100 J	0.34 J	<0.58 UJ	34 J	12 J	53	6 J	0.083	0.072 J	40 J	2.9 J	<1.2	NA	<1.2 UJ	40 J	69 J
SS-RABE-014-000		10/14/03	<2.2 R	7.6 J	150 J	0.37 J	<0.54 UJ	31 J	12 J	43	8.6 J	0.063	0.1 J	32 J	1.1 J	<1.1	NA	<1.1 UJ	49 J	55 J
SS-RABE-015-000		10/14/03	<2.2 R	8.7 J	210 J	0.41 J	<0.55 UJ	33 J	20 J	46	8.1 J	0.066	0.051 J	42 J	1.4 J	<1.1	NA	<1.1 UJ	53 J	58 J
SS-RABE-016-000		10/14/03	<2.2 R	7.9 J	130 J	0.14 J	<0.55 UJ	30 J	14 J	46	6 J	0.12	0.04 J	31 J	2.8 J	<1.1	NA	<1.1 UJ	60 J	63 J
SS-RABE-017-000		10/14/03	<2.3 R	5.9 J	220 J	0.5 J	<0.57 UJ	42 J	16 J	65	9.2 J	0.058	<1.1 UJ	50 J	2.3 J	<1.1	NA	<1.1 UJ	50 J	79 J
SS-RABE-017-500		10/14/03	<2.3 R	6.9 J	210 J	0.48 J	<0.57 UJ	42 J	18 J	65	10 J	0.048	<1.1 UJ	51 J	2 J	<1.1	NA	<1.1 UJ	50 J	77 J
SS-RABE-018-000		10/14/03	<2.1 R	8.2 J	140 J	0.28 J	<0.53 UJ	24 J	13 J	32	14 J	0.043	<1.1 UJ	27 J	1.6 J	<1.1	NA	<1.1 UJ	52 J	49 J
SS-RABE-019-000		10/14/03	<2.2 R	9 J	150 J	0.36 J	<0.55 UJ	32 J	13 J	47	5.8 J	0.051	<1.1 UJ	29 J	2.3 J	<1.1	NA	<1.1 UJ	54 J	57 J
SS-RABE-020-000		10/14/03	<2.3 R	3.9 J	270 J	0.45 J	<0.58 UJ	36 J	21 J	65	14 J	0.073	0.037 J	48 J	1.7 J	<1.2	NA	<1.2 UJ	44 J	84 J
SS-RABE-021-000		10/14/03	<2.2 R	14 J	250 J	0.41 J	<0.56 UJ	33 J	9.8 J	62	34 J	0.15	<1.1 UJ	33 J	1.5 J	<1.1	NA	<1.1 UJ	53 J	76 J

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in **bold** type.
Metals analyzed using EPA Method 6010B/7471A.

J	The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
mg/kg	milligrams per kilogram
R	Data rejected based on QC exceedances (see Appendix D for data validation results).
NA	Not analyzed.
Sample IDs:	SS-RABE-002-001 denotes a surface soil confirmation sample; -RABE is a location identifier indicating the sample was collected from the Ridge Area, F1 denotes Flare Site 1; F2 denotes; Flare Site 2; F3 denotes Flare Site 3; BE is bottom of excavation; F23SF indicates the stockpile footprint from Flare Site 2 and 3; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additional 1-foot lift of soil was removed. SS-RABE-01B-501 is a split duplicate sample.

Table 2-6b

Ridge Area - Remediation Stockpile Footprint Samples

TEPH and Perchlorate Analytical Results

(concentrations expressed in mg/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	TEPH			Perchlorate
			Diesel	Kerosene	Motor Oil	
Human Health Screening Criteria						7.8
Flare Site 1 Stockpile Footprint						
SS-F1SF-001		1/30/04	NA	NA	NA	<0.065
SS-F1SF-002		1/30/04	NA	NA	NA	<0.058
SS-F1SF-003		1/30/04	NA	NA	NA	<0.059
SS-F1SF-004		1/30/04	NA	NA	NA	<0.058
SS-F1SF-005		1/30/04	NA	NA	NA	<0.056
SS-F1SF-006		1/30/04	NA	NA	NA	<0.057
North Valley Area 2 Stockpile Footprint						
SS-RABE-001-000		10/14/03	3	<1.1	<55	NA
SS-RABE-002-000		10/14/03	3.4	<1.1	<54	NA
SS-RABE-003-000		10/14/03	1.2	<1.1	<56	NA
SS-RABE-004-000		10/14/03	2.5	<1.1	<54	NA
SS-RABE-005-000		10/14/03	<1.1	<1.1	<55	NA
SS-RABE-006-000		10/14/03	4.7	<1	<52	NA
SS-RABE-007-000	Yes	10/14/03	2.6	<1.1	<55	NA
SS-RABE-008-000	Yes	10/14/03	3.5	<1.1	<57	NA
SS-RABE-008-500	Yes	10/14/03	4.1	<1.1	<56	NA
North Valley Stockpile Footprints						
SS-RABE-012-000		10/14/03	8.3	<1.1	<55	NA
SS-RABE-013-000		10/14/03	<1.2	<1.2	<58	NA
SS-RABE-014-000		10/14/03	2.8	<1.1	<54	NA
SS-RABE-015-000		10/14/03	3	<1.1	<55	NA
SS-RABE-016-000		10/14/03	2.7	<1.1	<55	NA
SS-RABE-017-000		10/14/03	1.6	<1.1	<57	NA
SS-RABE-017-500		10/14/03	<1.1	<1.1	<57	NA
SS-RABE-018-000		10/14/03	3.2	<1.1	<53	NA
SS-RABE-019-000		10/14/03	3.3	<1.1	<55	NA
SS-RABE-020-000		10/14/03	<1.2	<1.2	<58	NA
SS-RABE-021-000		10/14/03	4.1	<1.1	<56	NA

Notes:

1 "Yes" indicates that the sample was removed by further excavation.

mg/kg milligrams per kilogram

NA Not analysed

Perchlorate Perchlorate analyzed using EPA method 314

TEPH Total extractable petroleum hydrocarbons analyzed using EPA method 8015.

Sample IDs SS-RABE-002-001 denotes a surface soil confirmation sample; -RABE is a location identifier indicating the sample was collected from the Ridge Area, F1 denotes Flare Site 1; F2 denotes; Flare Site 2; F3 denotes Flare Site 3; BE is bottom of excavation; F1SF indicates the stockpile footprint from Flare Site1; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-RABE-018-501 is a split duplicate sample.

Table 2-6c
Ridge Area - Remediation Stockpile Footprint Samples
PAH Analytical Results
(concentrations expressed in ug/kg)

Sample ID	Soil Removed by Excavation	Sample Date	PAHs															
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
Human Health Screening Criteria			2,600		22,000	0.62	0.062	0.62	2,300	0.61	6.1	0.062	2300	1,800	0.62	56	22000	2,300
North Valley Stockpiles																		
SS-RABE-012-000		10/14/03	<11	<11	<5.5	<5.5	<5.5	<5.5	<11	<5.5	<5.5	<11	<5.5	<5.5	<11	<22	<5.5	<5.5
SS-RABE-013-000		10/14/03	<12	<12	<5.8	<5.8	<5.8	<5.8	<12	<5.8	<5.8	<12	<5.8	<5.8	<12	<23	<5.8	<5.8
SS-RABE-014-000		10/14/03	<11	<11	<5.4	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<11	<5.4	<5.4	<11	<22	<5.4	<5.4
SS-RABE-015-000		10/14/03	<11	<11	<5.5	<5.5	<5.5	<5.5	<11	<5.5	<5.5	<11	<5.5	<5.5	<11	<22	<5.5	<5.5
SS-RABE-016-000		10/14/03	<11	<11	<5.5	<5.5	<5.5	<5.5	<11	<5.5	<5.5	<11	<5.5	<5.5	<11	<22	<5.5	<5.5
SS-RABE-017-000		10/14/03	<11	<11	<5.7	<5.7	<5.7	<5.7	<11	<5.7	<5.7	<11	<5.7	<5.7	<11	<23	<5.7	<5.7
SS-RABE-017-500		10/14/03	<11	<11	<5.7	<5.7	<5.7	<5.7	<11	<5.7	<5.7	<11	<5.7	<5.7	<11	<23	<5.7	<5.7
SS-RABE-018-000		10/14/03	<11	<11	<5.3	<5.3	<5.3	<5.3	<11	<5.3	<5.3	<11	<5.3	<5.3	<11	<21	<5.3	<5.3
SS-RABE-019-000		10/14/03	<11	<11	<5.5	<5.5	<5.5	<5.5	<11	<5.5	<5.5	<11	<5.5	<5.5	<11	<22	<5.5	<5.5
SS-RABE-020-000		10/14/03	<12	<12	<5.8	<5.8	<5.8	<5.8	<12	<5.8	<5.8	<12	<5.8	<5.8	<12	<23	<5.8	<5.8
SS-RABE-021-000		10/14/03	<11	<11	<5.6	<5.6	<5.6	<5.6	<11	<5.6	<5.6	<11	<5.6	<5.6	<11	<22	<5.6	<5.6

Notes:
PAHs Polynuclear aromatic hydrocarbons analyzed using method EPA 8310.
ug/kg microgram per kilogram
Sample IDs: SS-RABE-002-001 denotes a surface soil confirmation sample; -RABE is a location identifier indicating the sample was collected from the Ridge Area, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-RABE-018-501 is a split duplicate sample.

Table 2-6d
Ridge Area - Remediation Stockpile Footprint Samples
Dioxin and Furan Analytical Results
(concentrations expressed in pg/g)

Sample ID	Soil Removed by Excavation[1]	Sample Date	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF	TEQ
Preliminary Soil Remediation Goal[2]																				12
Flare Site 1 Stockpile Footprint																				
SS-F1SF-001		1/30/04	<0.52	<0.27	<0.31	<0.54	<0.54	<0.52	<0.5	<0.5	<0.58	<0.9	<0.54	<0.53	<0.53	<0.44	<0.31	<0.98	<0.7	**0.6**
SS-F1SF-004		1/30/04	<0.53	<0.3	<0.35	<0.69	<0.64	<0.66	<0.59	<0.64	<0.68	<0.95	<0.57	<0.62	<0.54	<0.51	<0.31	<0.79	<0.86	**0.69**
Flare Site 2 & 3 Stockpile Footprint																				
SS-F23SF-001		1/30/04	<0.81	<0.52	<0.6	<1	<0.87	<1	<0.8	<0.96	<0.93	<1.6	<0.91	<0.85	<0.88	<0.78	<0.46	<1.3	<1.6	**1.4**
Flare Site 3 Stockpile Footprint																				
SS-F3SF-001		1/30/04	<0.5	<0.33	<0.39	<0.67	<0.51	<0.65	<0.48	<0.62	<0.55	<1	<0.52	<0.5	<0.51	<0.5	<0.33	<0.78	<0.83	**0.87**
North Valley Area 1 Stockpile Footprint																				
SS-RABE-010-000		10/14/03	8.1	2.8 UJ	<0.95	<1.1	<0.97	<1	<0.93	<0.98	<0.97	<1.8	<1.1	<0.94	<1.1	<0.94	<0.81	68	7.9	1.8
SS-RABE-011-000		10/14/03	17	4.6 UJ	<0.72	<0.83	<0.71	<0.78	<0.67	<0.76	<0.71	<1.4	<0.85	<0.68	<0.83	<0.78	<0.85	160	20	1.7

Notes:
Analytical results that exceed Preliminary Soil Remediation Goals established in the RI/FS (EarthTech 2001) or human health screening criteria are shown in bold type.
Dioxins/furans analyzed using EPA method 8290.

1	No further excavation was required. Soil represented by the samples remained in place.
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
pg/g	picograms per gram
Sample IDs:	SS-RABE-002-001 denotes a surface soil confirmation sample; -RABE is a location identifier indicating the sample was collected from the Ridge Area. F1 denotes Flare Site 1; F2 denotes; Flare Site 2; F3 denotes Flare Site 3; BE is bottom of excavation; F23SF indicates the stockpile footprint from Flare Site 2 and 3; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additional 1-foot lift of soil was removed. SS-RABE-018-501 is a split duplicate sample.

Table 2-6e
Ridge Area - Remediation Stockpile Footprint Samples
Pesticide Analytical Results
(concentrations expressed in ug/kg)

Sample ID	Soil Removed by Excavation[1]	Sample Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	4,4'-Methoxychlor	Aldrin	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane (Technical)	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Toxaphene
US EPA Residential Preliminary Remediation Goals[2]			2400	1,700	1,700	310,000	29	90	1600	320	1600	320	300	370,000	370000		18000	1,800	1,800		1,600	110	53	440
North Valley Area 2 Stockpile Footprint																								
SS-RABE-001-000		10/14/03	<2.2	<2.2	<2.2	<2.2	<2.2	2.5	<2.2	10	<55	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	3 J	<2.2	<110
SS-RABE-002-000		10/14/03	<2.2	<2.2	<2.2	<2.2	<2.2	2.5	<2.2	10	<54	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	3.1 J	<2.2	<110
SS-RABE-003-000		10/14/03	<2.2	<2.2	<2.2	<2.2	<2.2	7.6	<2.2	31	<56	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	9.3 J	<2.2	<110
SS-RABE-004-000		10/14/03	<11	<11	<11	<11	<11	57	<11	230	<270	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	68 J	<11	<540
SS-RABE-005-000		10/14/03	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	11	<55	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	3.9 J	<2.2	<110
SS-RABE-006-000		10/14/03	<10	<10	<10	<10	<10	26	<10	100	<260	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	33 J	<10	<520
SS-RABE-007-000	Yes	10/14/03	<22	<22	<22	<22	<22	70	<22	340	<550	<22	<22	<22	<22	<22	<22	<22	<22	<22	<22	91 J	<22	<1100
SS-RABE-007		1/30/04	<4	<4	<4	<20	<2	0.91	<2	<2	NA	<2	<4	<2	<4	<4	<4	<4	<4	<2	<2	<2	<2	<80
SS-RABE-008-000	Yes	10/14/03	<110	<110	<110	<110	<110	310	<110	1400	<2800	<110	<110	<110	<110	<110	<110	<110	<110	<110	<110	340 J	<110	<5700
SS-RABE-008-000-RS	Yes	10/31/03	<110	<110	<110	<110	<110	180	<110	790	<2800	<110	<110	<110	<110	<110	<110	<110	<110	<110	<110	200	<110	<5600
SS-RABE-008-500	Yes	10/14/03	<11	<11	<11	<11	<11	31	<11	260	<280	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	70 J	<11	<560
SS-RABE-008-500-RS	Yes	10/31/03	<23	<23	<23	<23	<23	97	<23	410	<570	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	100	<23	<1100
SS-RABE-008		1/30/04	<4.4	2.5	1.5	<22	<2.2	17	<2.2	<2.2	NA	<2.2	<4.4	<2.2	<4.4	<4.4	<4.4	2.3	<4.4	<2.2	<2.2	21 J	2.1	<88

Notes:
Pesticides analyzed using EPA Method 8081
1 "Yes" indicates that the sample was removed by further excavation.
2 Preliminary soil remediation goals or human health screening criteria for pesticides were not established in the Non-OE RDD.
J The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
NA Not analysed
ug/kg micrograms per kilogram
Sample IDs: SS-RABE-002-001 denotes a surface soil confirmation sample; -RABE is a location identifier indicating the sample was collected from the Ridge Area, bottom of excavation; -002 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed. SS-RABE-008-500-RS is a split duplicate sample, with RS denoting resample.

Table 3-1a
South Valley--Remediation Area (Demo Site 1, Demo Site 3, and Flare Site 1)
Screening-Level Health Risk Estimates
Using Maximum Detected Concentrations

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	U.S. EPA Region IX Residential PRG (mg/kg)			Noncancer Ratio	Cancer Ratio
Metals											
Aluminum	31	31	100%	43000	27535	Yes	76000	nc		5.7E-01	NA
Antimony	47	7	15%	2	2.31	No	31	nc		NA	NA
Arsenic	86	86	100%	31	18.2	Yes	0.39	ca		NA	**7.9E+01**
Barium	86	86	100%	370	448	No	5400	nc		NA	NA
Beryllium	86	56	65%	1.1	0.82	Yes	150	nc		7.3E-03	NA
Cadmium	86	33	38%	4.9	1.4	Yes	37	nc		1.3E-01	NA
Chromium	86	86	100%	76	63	Yes	210	ca		NA	3.6E-01
Cobalt	86	86	100%	36	23.1	Yes	900	ca		NA	4.0E-02
Copper	87	87	100%	380	71.7	Yes	3100	nc		1.2E-01	NA
Iron	29	29	100%	51000	43805	Yes	23000	nc		**2.2E+00**	NA
Lead	86	86	100%	68	69.9	No	150	nc	(1)	NA	NA
Manganese	29	28	97%	1700	1645	Yes	1800	nc		9.4E-01	NA
Mercury	142	105	74%	4.3	0.26	Yes	23	nc		1.9E-01	NA
Molybdenum	86	20	23%	1.8	NA	NA	390	nc		4.6E-03	NA
Nickel	86	86	100%	80	65	Yes	1600	nc		5.0E-02	NA
Selenium	86	45	52%	3.4	0.85	Yes	390	nc		8.7E-03	NA
Silver	86	8	9%	0.31	NA	NA	390	nc		7.9E-04	NA
Strontium	62	62	100%	100	na	NA	47000	nc		2.1E-03	NA
Thallium	86	22	26%	3.4	NA	NA	5.2	nc		6.5E-01	NA
Vanadium	86	86	100%	110	96.4	Yes	550	nc		2.0E-01	NA
Zinc	87	87	100%	630	106	Yes	23000	nc		2.7E-02	NA
Dioxin											
2,3,7,8-TCDD TEQ	17	7	41%	8.41E-07	NA	NA	4E-06	ca		NA	2.2E-01
Other											
Perchlorate	125	2	2%	0.03	NA	NA	7.8	ca/nc	(2)	3.8E-03	3.8E-03
Phosphorus	22	18	82%	930	458	Yes	NA		(3)	NA	NA
									Total Hazard Index:	**5E+00**	--
									Total Hazard Index (without iron and manganese):	**2E+00**	
									Total Excess Cancer Risk:	--	**8E-05**
									Total Excess Cancer Risk (without arsenic):	--	**6E-07**

Notes:
Bold numbers indicate values greater than 1.0.
nc = PRG based on noncancer effects
ca = PRG based on cancer effects
NA = Not applicable
(1) California-modified PRG.
(2) This PRG has been withdrawn.
(3) There is no PRG for this chemical.

Table 3-1b
South Valley--Remediation Area (Demo Site 1, Demo Site 3, and Flare Site 1)
Screening-Level Health Risk Estimates
Using 95% UCL Concentrations

Chemical	Number of Samples	Number of Detects	Detection Frequency	95% UCL Concentration (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	U.S. EPA Region IX Residential PRG (mg/kg)			Noncancer Ratio	Cancer Ratio
Metals											
Aluminum	31	31	100%	39945	27535	Yes	76000	nc		5.3E-01	NA
Antimony	47	7	15%	1.09	2.31	No	31	nc		NA	NA
Arsenic	86	86	100%	13.45	18.2	Yes	0.39	ca		NA	**3.4E+01**
Barium	86	86	100%	217.98	448	No	5400	nc		NA	NA
Beryllium	86	56	65%	0.61	0.82	Yes	150	nc		4.1E-03	NA
Cadmium	86	33	38%	1.18	1.4	Yes	37	nc		3.2E-02	NA
Chromium	86	86	100%	51.06	63	Yes	210	ca		NA	2.4E-01
Cobalt	86	86	100%	18.91	23.1	Yes	900	ca		NA	2.1E-02
Copper	87	87	100%	91.46	71.7	Yes	3100	nc		3.0E-02	NA
Iron	29	29	100%	46845	43805	Yes	23000	nc		**2.0E+00**	NA
Lead	86	86	100%	18.37	69.9	No	150	nc	(1)	NA	NA
Manganese	29	28	97%	1149	1645	Yes	1800	nc		6.4E-01	NA
Mercury	142	105	74%	0.42	0.26	Yes	23	nc		1.8E-02	NA
Molybdenum	86	20	23%	1.02	NA	NA	390	nc		2.6E-03	NA
Nickel	86	86	100%	54.10	65	Yes	1600	nc		3.4E-02	NA
Selenium	86	45	52%	1.88	0.85	Yes	390	nc		4.8E-03	NA
Silver	86	8	9%	0.64	NA	NA	390	nc		1.6E-03	NA
Strontium	62	62	100%	57.69	na	NA	47000	nc		1.2E-03	NA
Thallium	86	22	26%	1.23	NA	NA	5.2	nc		2.4E-01	NA
Vanadium	86	86	100%	99.86	96.4	Yes	550	nc		1.8E-01	NA
Zinc	87	87	100%	261	106	Yes	23000	nc		1.1E-02	NA
Dioxin											
2,3,7,8-TCDD TEQ	17	7	41%	1.52E-06	NA	NA	4E-06	ca		NA	3.9E-01
Other											
Perchlorate	125	2	2%	0.026	NA	Yes	7.8	ca/nc	(2)	3.4E-03	3.4E-03
Phosphorus	22	18	82%	515	458	Yes	NA		(3)	NA	NA
									Total Hazard Index:	**4E+00**	--
									Total Hazard Index (without iron and manganese):	**1E+00**	
									Total Excess Cancer Risk:	--	**4E-05**
									Total Excess Cancer Risk (without arsenic):	--	**7E-07**

Notes:
Bold numbers indicate values greater than 1.0.
nc = PRG based on noncancer effects
ca = PRG based on cancer effects
NA = Not applicable
(1) California-modified PRG.
(2) This PRG has been withdrawn.
(3) There is no PRG for this chemical.

Table 3-2
South Valley--Flare Site 3
Screening-Level Health Risk Estimates
Using Maximum Detected Concentrations

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	U.S. EPA Region IX Residential PRG (mg/kg)			Noncancer Ratio	Cancer Ratio
Metals											
Arsenic	3	3	100%	11	18.2	No	0.39	ca		NA	NA
Barium	3	3	100%	170	448	No	5400	nc		NA	NA
Beryllium	3	3	100%	0.36	0.82	No	150	nc		NA	NA
Cadmium	3	3	100%	0.42	1.4	No	37	nc		NA	NA
Chromium	3	3	100%	32	63	No	210	ca		NA	NA
Cobalt	3	3	100%	14	23.1	No	900	ca		NA	NA
Copper	3	3	100%	40	71.7	No	3100	nc		NA	NA
Lead	3	3	100%	4.4	69.9	No	150	nc	(1)	NA	NA
Mercury	3	3	100%	0.073	0.26	No	23	nc		NA	NA
Molybdenum	3	3	100%	0.28	NA	NA	390	nc		7.2E-04	NA
Nickel	3	3	100%	25	65	No	1600	nc		NA	NA
Selenium	3	2	67%	0.92	0.85	**Yes**	390	nc		2.4E-03	NA
Silver	3	3	100%	0.21	NA	NA	390	nc		5.4E-04	NA
Strontium	2	2	100%	40	NA	NA	47000	nc		8.5E-04	NA
Vanadium	3	3	100%	73	96.4	No	550	nc		NA	NA
Zinc	3	3	100%	52	106	No	23000	nc		NA	NA
						Total Hazard Index:				**4E-03**	--
						Total Hazard Index (without iron and manganese):				**3E-03**	--
						Total Excess Cancer Risk:				--	**0E+00**
						Total Excess Cancer Risk (without arsenic):				--	**0E+00**

Notes:
All results for antimony were rejected.
nc = PRG based on noncancer effects
ca = PRG based on cancer effects
NA = Not applicable
(1) California-modified PRG.

Table 3-3
Ridge Area--Flare Site 2 and miscellaneous*
Screening-Level Health Risk Estimates
Using Maximum Detected Concentrations

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	U.S. EPA Region IX Residential PRG (mg/kg)			Noncancer Ratio	Cancer Ratio
Metals											
Aluminum	7	7	100%	23000	27535	No	76000	nc		NA	NA
Antimony	5	1	20%	0.32	2.31	No	31	nc		NA	NA
Arsenic	9	9	100%	16	18.2	No	0.39	ca		NA	NA
Barium	9	8	89%	670	448	**Yes**	5400	nc		1.2E-01	NA
Beryllium	9	6	67%	0.92	0.82	**Yes**	150	nc		6.1E-03	NA
Cadmium	9	9	100%	3.5	1.4	**Yes**	37	nc		9.5E-02	NA
Chromium	9	9	100%	78	63	**Yes**	210	ca		NA	3.7E-01
Cobalt	9	9	100%	41	23.1	**Yes**	900	ca		NA	4.6E-02
Copper	9	9	100%	86	71.7	**Yes**	3100	nc		2.8E-02	NA
Iron	7	7	100%	42000	43805	No	23000	nc		NA	NA
Lead	9	9	100%	28	69.9	No	150	nc	(1)	NA	NA
Manganese	7	7	100%	1700	1645	**Yes**	1800	nc		9.4E-01	NA
Mercury	9	6	67%	0.1	0.26	No	23	nc		NA	NA
Molybdenum	9	1	11%	0.56	NA	NA	390	nc		1.4E-03	NA
Nickel	9	9	100%	76	65	**Yes**	1600	nc		4.8E-02	NA
Silver	9	1	11%	0.43	NA	NA	390	nc		1.1E-03	NA
Strontium	7	7	100%	36	na	NA	47000	nc		7.7E-04	NA
Vanadium	9	8	89%	120	96.4	**Yes**	550	nc		2.2E-01	NA
Zinc	9	9	100%	110	106	**Yes**	23000	nc		4.8E-03	NA
Other Organics											
Nitrate	7	6	86%	2.9	NA	NA	1E+05	nc	(2)	2.2E-05	NA
Nitrite	7	1	14%	0.28	NA	NA	7800	nc	(3)	3.6E-05	NA
Phosphorus	5	5	100%	61	458	No	NA		(4)	NA	NA
									Total Hazard Index:	**1E+00**	--
									Total Hazard Index (without iron and manganese):	**3E-01**	--
									Total Excess Cancer Risk:	--	**4E-07**
									Total Excess Cancer Risk (without arsenic):	--	**4E-07**

Notes:
*See Figure 1-2
nc = PRG based on noncancer effects
ca = PRG based on cancer effects
NA = Not applicable
(1) California-modified PRG.
(2) A PRG has not been developed for nitrate; therefore, a PRG was calculated according to U.S. EPA Region IX's methodology and the oral RfD provided in the Integrated Risk Information System
(3) A PRG has not been developed for nitrite; therefore, a PRG was calculated according to U.S. EPA Region IX's methodology and the oral RfD provided in the Integrated Risk Information System
4) There is no PRG for this chemical.

Table 3-4a
Ridge Area--Former Remediation Stockpile Footprint Area
Screening-Level Health Risk Estimates
Using Maximum Detected Concentrations

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	U.S. EPA Region IX Residential PRG (mg/kg)			Noncancer Ratio	Cancer Ratio
Metals											
Arsenic	25	25	100%	19	18.2	Yes	0.39	ca		NA	**4.9E+01**
Barium	25	25	100%	270	448	No	5400	nc		NA	NA
Beryllium	25	14	56%	0.62	0.82	No	150	nc		NA	NA
Cadmium	25	1	4%	0.34	1.4	No	37	nc		NA	NA
Chromium	25	25	100%	48	63	No	210	ca		NA	NA
Cobalt	25	25	100%	26	23.1	Yes	900	ca		NA	2.9E-02
Copper	25	25	100%	70	71.7	No	3100	nc		NA	NA
Lead	25	25	100%	34	69.9	No	150	nc	(1)	NA	NA
Mercury	25	19	76%	0.15	0.26	No	23	nc		NA	NA
Molybdenum	25	9	36%	0.18	NA	NA	390	nc		4.6E-04	NA
Nickel	25	25	100%	60	65	No	1600	nc		NA	NA
Selenium	25	14	56%	2.9	0.85	Yes	390	nc		7.4E-03	NA
Silver	25	1	4%	0.21	NA	NA	390	nc		5.4E-04	NA
Strontium	6	6	100%	30	na	NA	47000	nc		6.4E-04	NA
Vanadium	25	25	100%	73	96.4	No	550	nc		NA	NA
Zinc	25	25	100%	84	106	No	23000	nc		NA	NA
Dioxin											
2,3,7,8-TCDD TEQ	6	2	33%	3.96E-07	NA	NA	4E-06	ca		NA	1.0E-01
Other											
4,4'-DDE	8	1	13%	0.0025	NA	NA	1.7	ca		NA	1.5E-03
4,4'-DDT	8	1	13%	0.0015	NA	NA	1.7	ca		NA	8.8E-04
alpha-BHC	8	7	88%	0.057	NA	NA	0.09	ca		NA	6.3E-01
beta-BHC	8	6	75%	0.23	NA	NA	0.32	ca		NA	7.2E-01
Endrin aldehyde	8	1	13%	0.0023	NA	NA	NA		(2)	NA	NA
Heptachlor	8	7	88%	0.068	NA	NA	0.11	ca		NA	6.2E-01
Heptachlor epoxide	8	1	13%	0.0021	NA	NA	0.053	ca		NA	4.0E-02
Phosphorus	10	10	100%	361	458	No	NA		(2)	NA	NA
									Total Hazard Index:	**9E-03**	--
									Total Excess Cancer Risk:	--	**5E-05**
									Total Excess Cancer Risk (without arsenic):	--	**2E-06**

Notes:
Results for antimony were rejected except for one non-detect.
Bold numbers indicate values greater than 1.0.
nc = PRG based on noncancer effects
ca = PRG based on cancer effects
NA = Not applicable
(1) California-modified PRG.
(2) There is no PRG for this chemical.

Table 3-4b
Ridge Area--Former Remediation Stockpile Footprint Area
Screening-Level Health Risk Estimates
Using 95% UCLs

Chemical	Number of Samples	Number of Detects	Detection Frequency	95% UCL (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	U.S. EPA Region IX Residential PRG (mg/kg)			Noncancer Ratio	Cancer Ratio
Metals											
Arsenic	25	25	100%	10.8	18.2	Yes	0.39	ca		NA	**2.8E+01**
Barium	25	25	100%	181	448	No	5400	nc		NA	NA
Beryllium	25	14	56%	0.4	0.82	No	150	nc		NA	NA
Cadmium	25	1	4%	0.3	1.4	No	37	nc		NA	NA
Chromium	25	25	100%	36.6	63	No	210	ca		NA	NA
Cobalt	25	25	100%	16.0	23.1	Yes	900	ca		NA	1.8E-02
Copper	25	25	100%	55.5	71.7	No	3100	nc		NA	NA
Lead	25	25	100%	12.1	69.9	No	150	nc	(1)	NA	NA
Mercury	25	19	76%	0.1	0.26	No	23	nc		NA	NA
Molybdenum	25	9	36%	0.6	NA	NA	390	nc		1.6E-03	NA
Nickel	25	25	100%	40.1	65	No	1600	nc		NA	NA
Selenium	25	14	56%	0.6	0.85	Yes	390	nc		1.6E-03	NA
Silver	25	1	4%	2.0	NA	NA	390	nc		5.1E-03	NA
Strontium	6	6	100%	28.8	na	NA	47000	nc		6.1E-04	NA
Vanadium	25	25	100%	53.8	96.4	No	550	nc		NA	NA
Zinc	25	25	100%	67.9	106	No	23000	nc		NA	NA
Dioxin											
2,3,7,8-TCDD TEQ	6	2	33%	1.83E-06	NA	NA	4E-06	ca		NA	4.7E-01
Other											
4,4'-DDE	8	1	13%	0.005	NA	NA	1.7	ca		NA	3.2E-03
4,4'-DDT	8	1	13%	0.008	NA	NA	1.7	ca		NA	4.6E-03
alpha-BHC	8	7	88%	0.049	NA	NA	0.09	ca		NA	5.4E-01
beta-BHC	8	6	75%	0.208	NA	NA	0.32	ca		NA	6.5E-01
Endrin aldehyde	8	1	13%	0.006	NA	NA	NA		(2)	NA	NA
Heptachlor	8	7	88%	0.058	NA	NA	0.11	ca		NA	5.3E-01
Heptachlor epoxide	8	1	13%	0.008	NA	NA	0.053	ca		NA	1.4E-01
Phosphorus	10	10	100%	305	458	No	NA		(2)	NA	NA
									Total Hazard Index:	**9E-03**	--
									Total Excess Cancer Risk:	--	**3E-05**
									Total Excess Cancer Risk (without arsenic):	--	**2E-06**

Notes:
Results for antimony were rejected except for one non-detect.
Bold numbers indicate values greater than 1.0.
nc = PRG based on noncancer effects
ca = PRG based on cancer effects
NA = Not applicable
(1) California-modified PRG.
(2) There is no PRG for this chemical.

Table 3-5
South Valley--Remediation Area (Demo Site 1, Demo Site 3, and Flare Site 1)
Screening-Level Ecological Risk Estimates
Using 95% UCLs

Chemical	Number of Samples	Number of detects	Frequency of detection (%)	95% UCL Concentration (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	Ecological Screening Criterion (mg/kg)	Basis for Criteria		Ratio
Metals										
Aluminum	31	31	100%	39945	27535	Yes	27535	Background		**1.5E+00**
Antimony	47	7	15%	1.09	2.31	No	5	Plants		2.2E-01
Arsenic	86	86	100%	13.45	18.2	Yes	60	Invertebrates		2.2E-01
Barium	86	86	100%	217.98	448	No	500	Plants		4.4E-01
Beryllium	86	56	65%	0.61	0.82	Yes	10	Plants		6.1E-02
Cadmium	86	33	38%	1.18	1.4	Yes	4	Plants		2.9E-01
Chromium	86	86	100%	51.06	63	Yes	160	Bird - Hawk		3.2E-01
Cobalt	86	86	100%	18.91	23.1	Yes	1200	Background		1.6E-02
Copper	87	87	100%	91.46	71.7	Yes	100	Plants		9.1E-01
Iron	29	29	100%	46845	43805	Yes	NA	NA	(1)	NA
Lead	86	86	100%	18.37	69.9	No	170	Bird - Hawk		1.1E-01
Manganese	29	28	97%	1149	1645	Yes	4500	Mammal - Deer		2.6E-01
Mercury	142	105	74%	0.42	0.26	Yes	0.3	Plants		**1.4E+00**
Molybdenum	86	20	23%	1.02	NA	NA	2	Plants		5.1E-01
Nickel	86	86	100%	54.10	65	Yes	200	Invertebrates		2.7E-01
Selenium	86	45	52%	1.88	0.85	Yes	3.2	Mammal - Deer		5.9E-01
Silver	86	8	9%	0.64	NA	NA	2	Plants		3.2E-01
Strontium	62	62	100%	57.69	NA	NA	2000	Mammal - Deer		2.9E-02
Thallium	86	22	26%	1.23	NA	NA	4.2	Mammal - Deer		2.9E-01
Vanadium	86	86	100%	99.86	96.4	Yes	17	Background		**5.9E+00**
Zinc	87	87	100%	261	106	Yes	200	Invertebrates		**1.3E+00**
Dioxin										
2,3,7,8-TCDD TEQ	17	7	41%	1.52E-06	NA	NA	0.00031	Mammal - Deer		4.9E-03
Other										
Perchlorate	125	2	2%	0.026	NA	Yes	NA	NA	(2)	NA
Phosphorus	22	18	82%	515	458	Yes	NA	NA	(1)	NA

Notes:
Bold numbers indicate values greater than 1.0.
(1) These elements are essential nutrients and generally not thought to pose an ecological concern.
(2) There is no ecological criteria for this chemical.

Table 3-6
South Valley - Flare Site 3
Screening-Level Ecological Risk Estimates
Using Maximum Concentrations(1)

Chemical	Number of Samples	Number of detects	Frequency of detection (%)	Maximum Detected Concentration (mg/kg)	95th Percentile of Ambient Soil Samples (mg/kg)	Maximum Detected Concentration Greater than 95th Percentile	Ecological Screening Criterion (mg/kg)	Basis for Criteria		Ratio
Metals										
Arsenic	3	3	100%	11	18.2	No	60	Invertebrates		1.8E-01
Barium	3	3	100%	170	448.0	No	500	Plants		3.4E-01
Beryllium	3	3	100%	0.36	0.8	No	10	Plants		3.6E-02
Cadmium	3	3	100%	0.42	1.4	No	4	Plants		1.1E-01
Chromium	3	3	100%	32	63.0	No	160	Bird - Hawk		2.0E-01
Cobalt	3	3	100%	14	23.1	No	1200	Background		1.2E-02
Copper	3	3	100%	40	71.7	No	100	Plants		4.0E-01
Lead	3	3	100%	4.4	69.9	No	170	Bird - Hawk		2.6E-02
Mercury	3	3	100%	0.073	0.3	No	0.3	Plants		2.4E-01
Molybdenum	3	3	100%	0.28	NA	NA	2	Plants		1.4E-01
Nickel	3	3	100%	25	65.0	No	200	Invertebrates		1.3E-01
Selenium	3	2	67%	0.92	0.9	Yes	3.2	Mammal - Deer		2.9E-01
Silver	3	3	100%	0.21	NA	NA	2	Plants		1.1E-01
Strontium	2	2	100%	40	na	NA	2000	Mammal - Deer		2.0E-02
Vanadium	3	3	100%	73	96.4	No	17	Background		**4.3E+00**
Zinc	3	3	100%	52	106.0	No	200	Invertebrates		2.6E-01

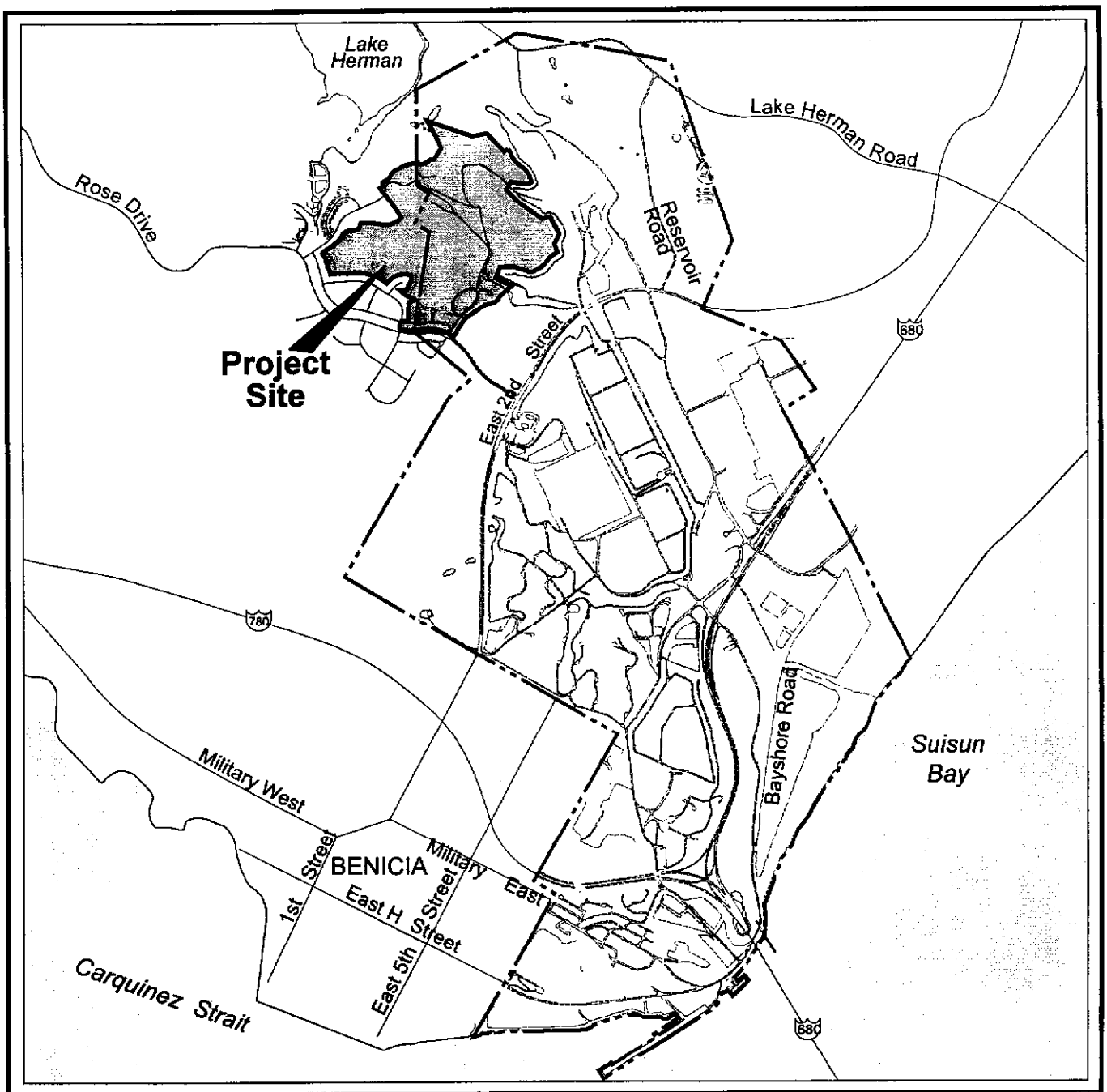
Notes:
All results for antimony were rejected.
Bold numbers indicate values greater than 1.0.
(1) The maximum values were used because there are too few data points to calculate 95% UCLs.

Table 3-7
South Valley - Wetland Areas
Sediment Screening Evaluation
Using 95% UCLs

Chemical	Number of Samples	Number of Detects	Detection Frequency	95% UCL Concentration1 (mg/kg)	Chronic Seidment Quality Criterion (mg/kg)	Max Detect greater than Criterion?
Explosives						
2,4,6-trinitrotoluene	3	1	33%	1.5	55	No
Dioxin						
2,3,7,8-TCDD TEQ	4	2	50%	1.10E-06	NC	NA
Polyaromatic Hydrocarbons (PAHs)						
benzo(b)fluoranthene	3	1	33%	0.094	240	No
Metals						
aluminum	3	3	100%	20600	58030	No
antimony	7	1	14%	0.18	NC	NA
arsenic	11	11	100%	10.6	12.1	No
barium	11	11	100%	221	NC	NA
beryllium	11	11	100%	0.42	NC	NA
cadmium	11	9	82%	0.49	NC	NA
chromium	11	11	100%	38.9	56	No
cobalt	11	11	100%	14.6	NC	NA
copper	11	11	100%	63.1	28	Yes
iron	3	3	100%	44000	20000	Yes
lead	11	11	100%	19.2	34.2	No
manganese	3	3	100%	1680	1673	Yes
mercury	29	29	100%	4.7	0.2	Yes
molybdenum	11	9	82%	0.69	NC	NA
nickel	11	11	100%	35.9	39.6	No
selenium	10	8	80%	2.6	NC	NA
silver	11	8	73%	0.26	NC	NA
strontium	8	8	100%	120	NC	NA
thallium	11	1	9%	0.36	NC	NA
vanadium	11	11	100%	75.0	NC	NA
zinc	11	11	100%	108	159	No
Other						
methyl mercury	18	15	83%	0.003	NC	NA
nitrogen, nitrate (as N)	2	2	100%	0.69	NC	NA
phosphorus	2	2	100%	472	NC	NA

NC - No relevant criteria available.
(1) - Probable Effect Concentration rather than Threshold Effect Concentration (TEC).
In cases in which the maximum detected value is less than the calculated 95% UCL, the maximum detected value was used.

FIGURES



EXPLANATION

- Interstate Highway
- Former Benicia Arsenal Boundary (estimated)
- Project Site

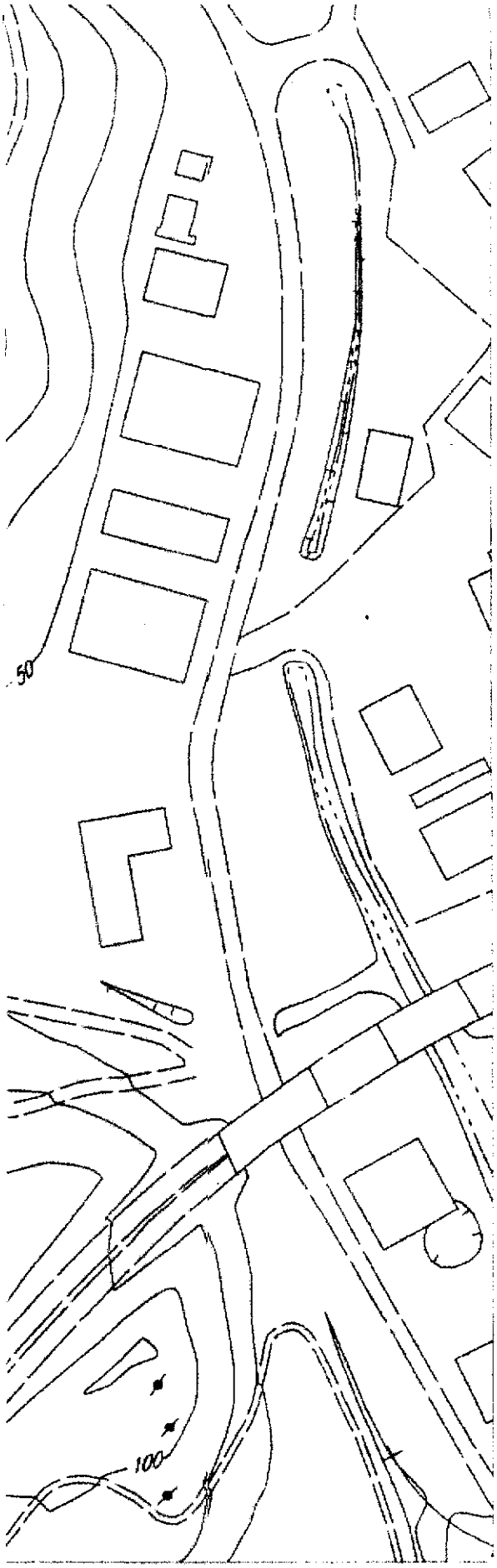
0 0.5
SCALE IN MILES

N

Source: Final Draft Tourtelot Project Site Ordinance and Explosives Remedial Design Document. Earth Tech 2001

northgate environmental management, inc.

Figure 1-1
Project Site Location
Tourtelot Cleanup Project, Benicia, California
March 2004



0' 200'

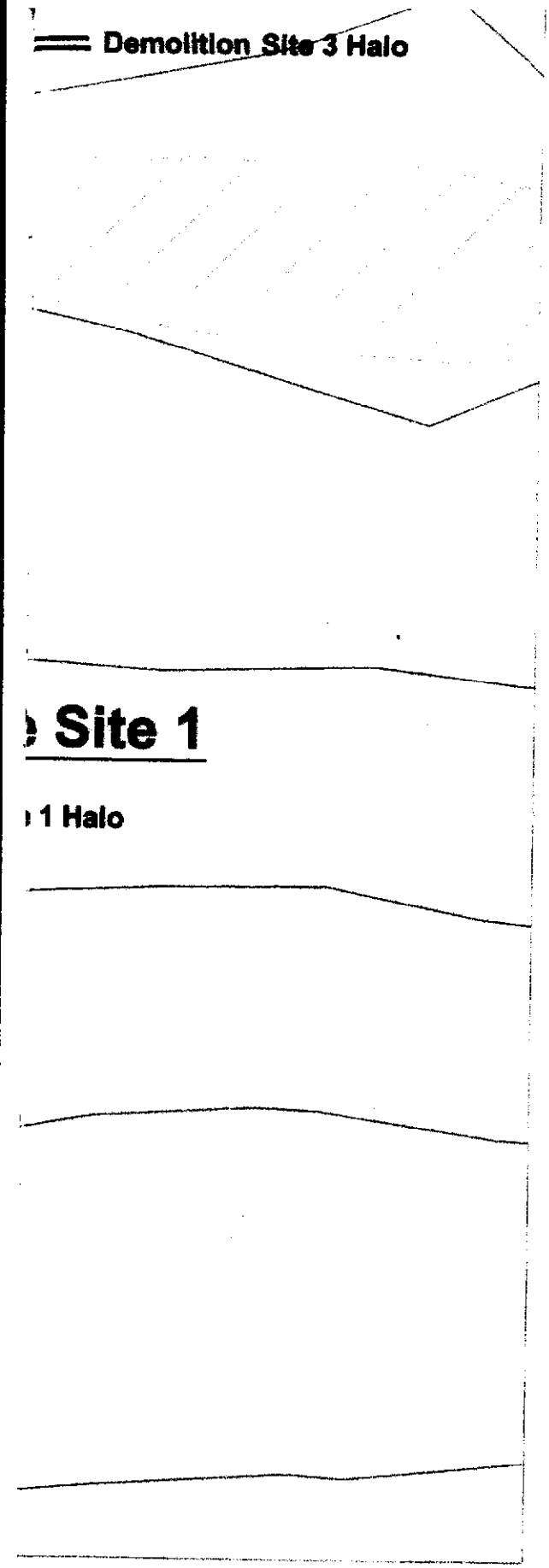
SCALE 1" : 200'

Date of topography July 1998 (Cartwright Aerial)

Figure 1-2
South Valley and Ridge Area

Tourtelot Cleanup Project
Benicia, California
March 2004
Project No. 1056.03

northgate environmental management, inc.



0' 40'

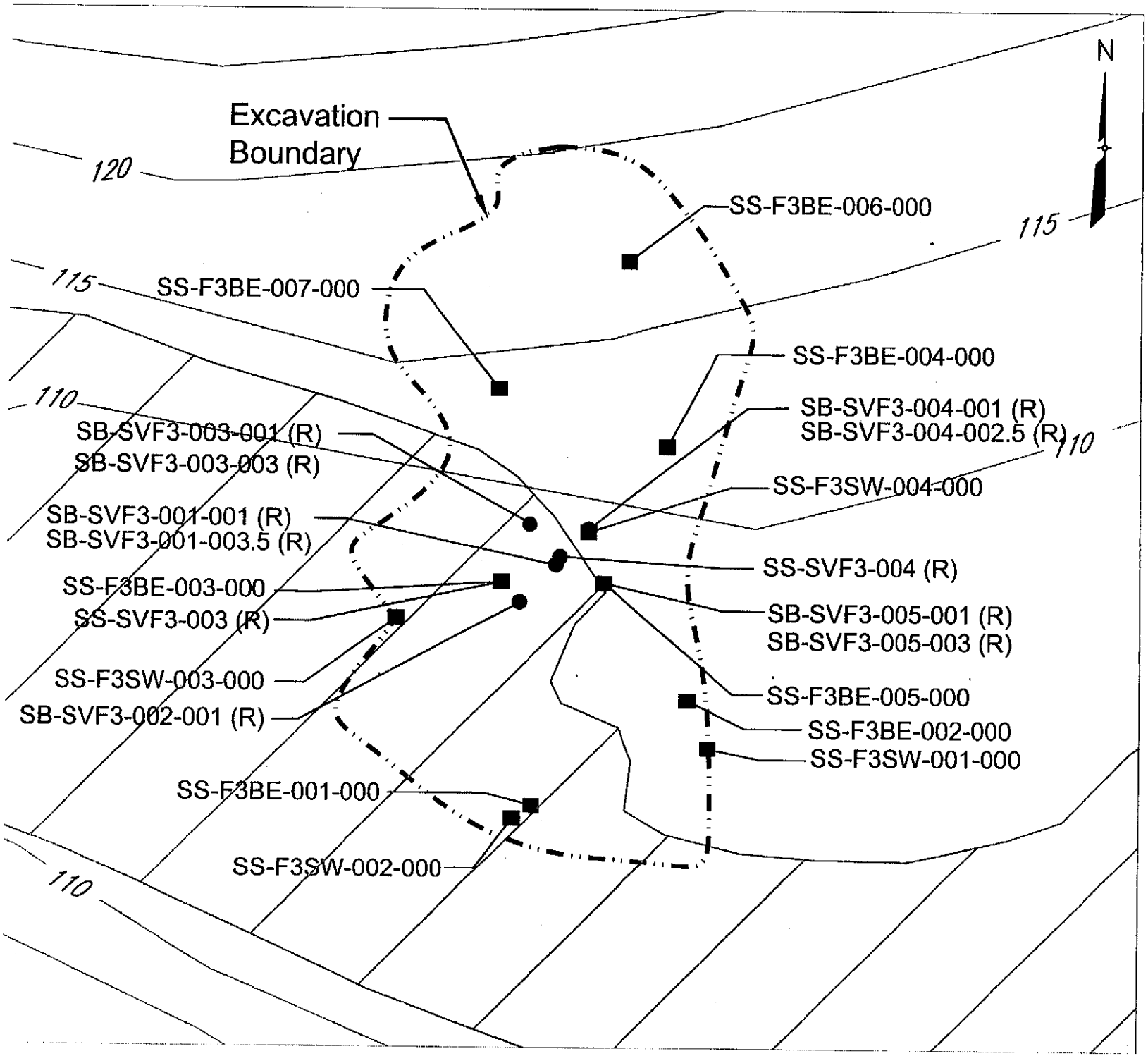
SCALE 1" : 40'

Date of topography July 1998 (Cartwright Aerial)

Figure 2-1
Detail of South Valley Remediation Area Sampling Locations

Tourtelot Cleanup Project
Benicia, California
March 2004
Project No. 1056.03

northgate environmental management, inc.



EXPLANATION

- ● Investigation Sampling Location
- ■ Confirmation Sampling Location

Note:
(R) indicates sample removed during remediation activities

Wetland

Date of topography July 1998 (Cartwright Aerial)

0' 7.5' 15'
SCALE 1" : 15'

Figure 2-2
South Valley - Detail of Flare Site 3 Sampling Locations

Tourtelot Cleanup Project
Benicia, California
March 2004
Project No. 1056.03

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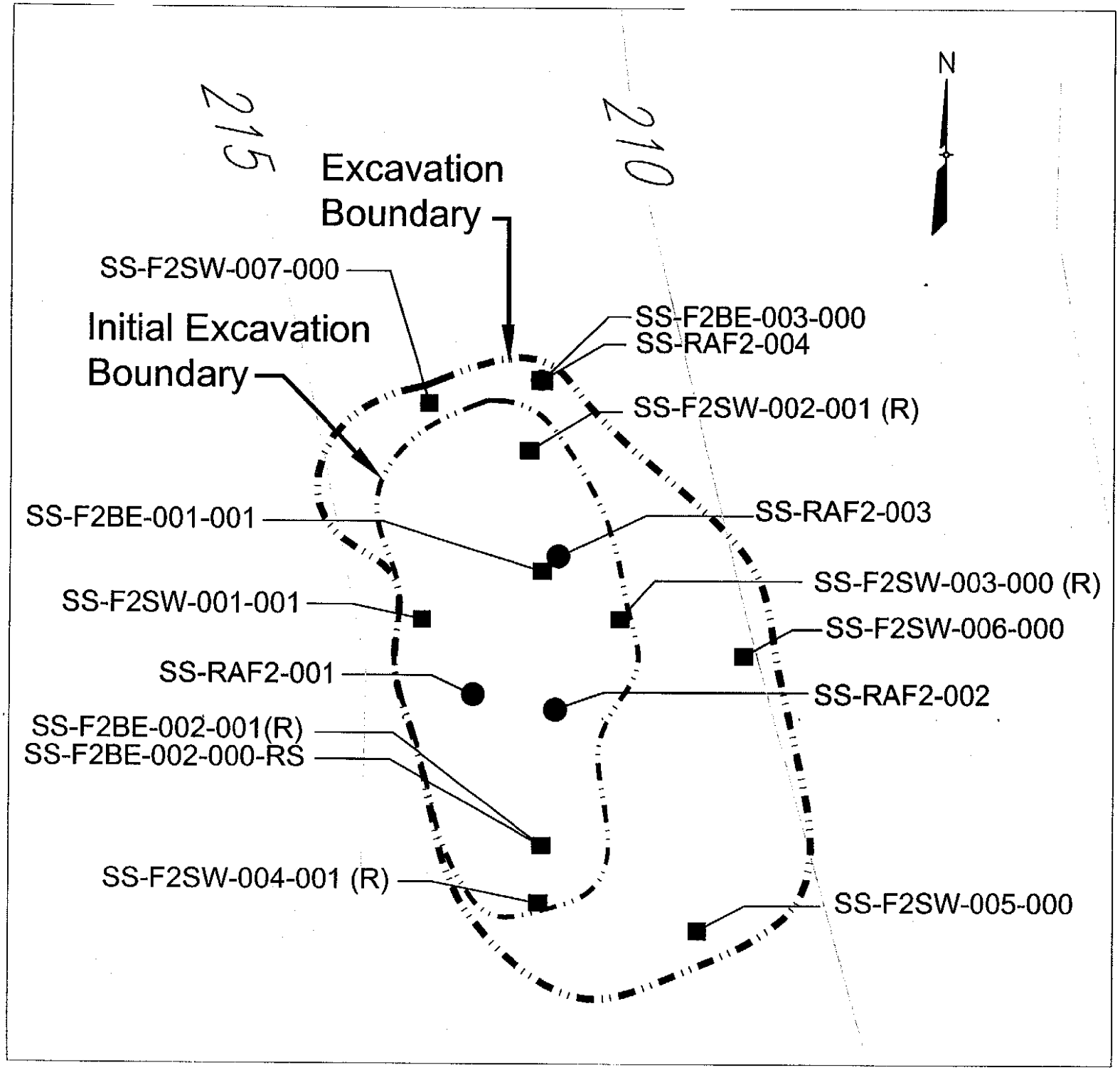

EXPL ION

- Investigation Sampling Location
- Confirmation Sampling Location

Notes:
1. (R) indicates sample removed during remediation activities
2. (RS) indicates resample following excavation of impacted soils

Date of topography July 1998 (Cartwright Aerial)

0' 5' 10'
SCALE

Figure 2-3
Ridge Area - Detail of Flare Site 2 Sampling Locations

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Benicia, California
March 2004
Project No. 1056.03

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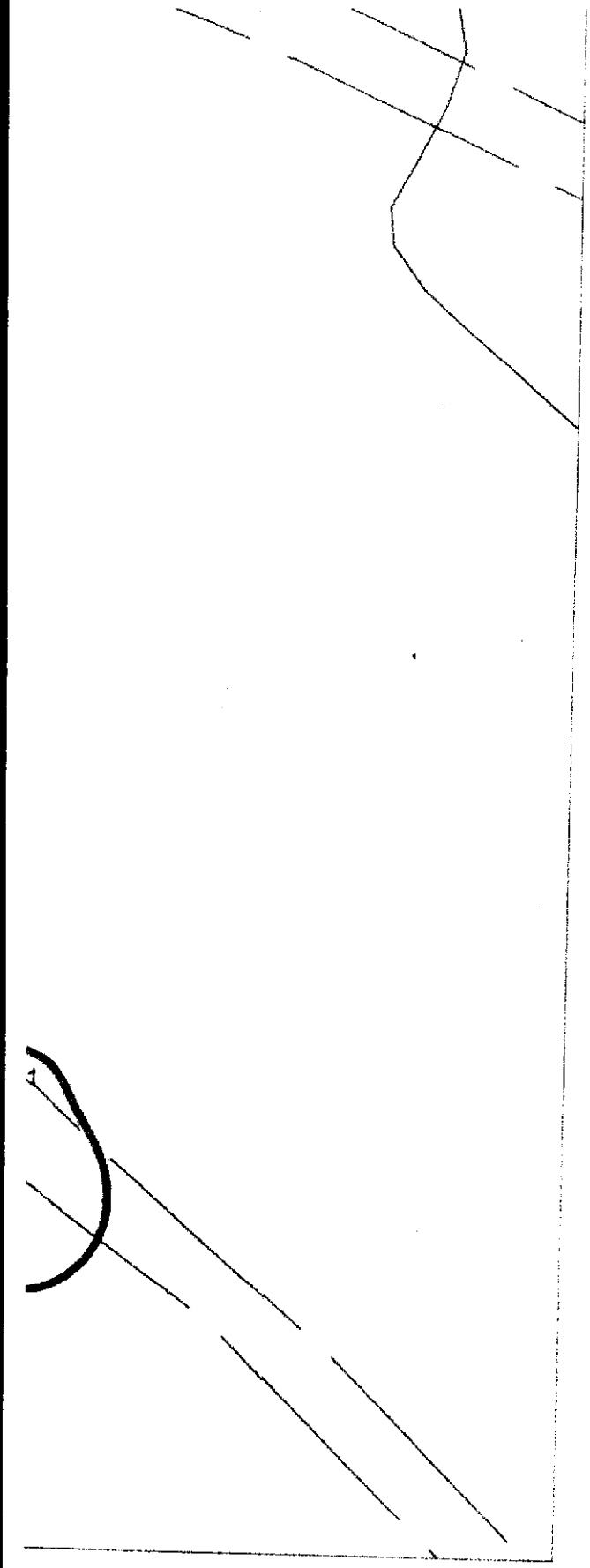

0' 200'

SCALE 1" : 200'

Date of topography July 1998 (Cartwright Aerial)

Figure 2-4
Ridge Area - Footprints of Former Remediation Stockpiles

Tourtelot Cleanup Project
Benicia, California
March 2004
Project No. 1056.03

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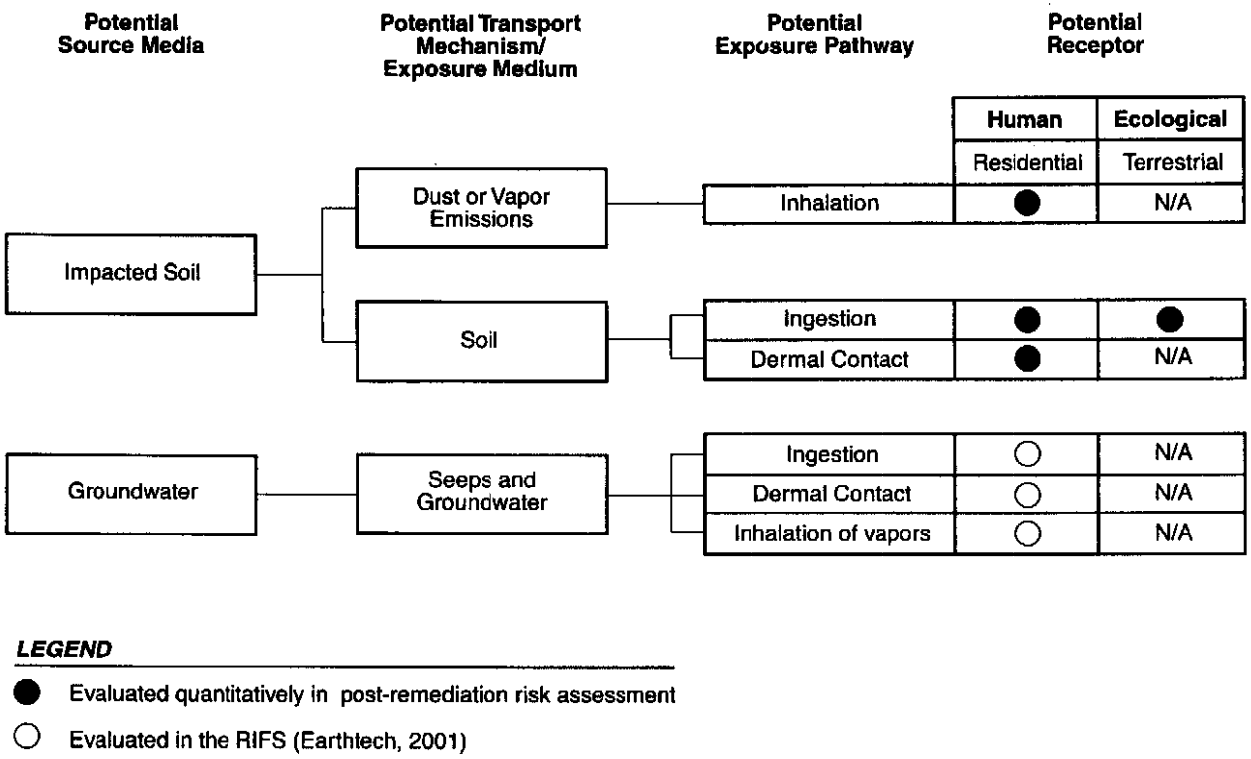

Figure 3-1. Conceptual site model for South Valley and Ridge Areas

8601664.002 0101 03/22/04 WA

APPENDICES

APPENDIX A

Appendix A

Field Change Request Forms

northgate environmental management, inc.
3629 Grand Avenue Oakland, California 94610
(510) 839-0688 Fax (510) 839-4350

Field Change Request

Field Change No. 1

Page 1 of 1

Project Name TOURTELOT

Project Number 1056.03

Applicable Document Appendix B of Non-OE RDD

Date Sept. 25, 2002

Description The frequency of duplicate samples provided to the United States Army Corps of Engineers (USACE) should be changed from 15%, as required in Section 1.9.1, to 10%. The USACE & DTSC have agreed that 10% samples are a sufficient check on quality.

Minor change [X] Major change [ ] Major Project Impact [ ]

Requested by Tom Kellogg

Reason for change 10% duplicates are currently collected by Northgate. An additional 10% duplicate requirement for USACE and DTSC is sufficient check on analytical quality.

Recommended Disposition Duplicate requirement should be reduced immediately.

Impact on Present and Completed Work The change will have no impact on present and completed work.

Cost Impact Costs will be reduced.

Accepted [X] Rejected [ ] Signature [signature] Project Manager Date 10/03/02

Accepted [X] Rejected [ ] Signature [signature] for Sandra Bachmann Project QC manager Date 10/3/02

(For changes to engineering drawings and construction specifications)

Accepted [ ] Rejected [ ] Signature _____ Project Manager Date _____

Concur - Nonconcur - Rework - USACE by [signature] Date 9/23/03

Accepted - Rejected - Rework - DTSC by [signature] Date 9/29/03

Remarks:

Final Disposition

Signature _____ Date _____

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Field Change Request

Field Change No. 2

Page 1 of 1

Project Name TOURTELOT

Project Number 1056.03

Applicable Document Final Non OE Remedial Design Document

Date March 10, 2003

Description Perchlorate will be added to list of compounds to be analyzed for blow-in place (BIP) samples, groundwater samples, and surface water samples. All groundwater and surface water, and 50% of BIP samples will undergo the perchlorate analyses. and analyzed

The BIP samples will be selected randomly. In addition one sample collected from TNT Strip 1 and 10% collected from Flare and Demo sites. and analyzed

Minor change [X] Major change [ ] Major Project Impact [ ]

Requested by James Austreng

Reason for change As requested by the DTSC to assess if perchlorate is present.

Recommended Disposition Immediate

Impact on Present and Completed Work None

Cost Impact Laboratory cost will increase $105 per sample

Accepted [X] Rejected [ ] Signature Jane Chambers Project Manager Date 3/12/03

Accepted [X] Rejected [ ] Signature Taylor Bennett Project QC manager Date 3/12/03

(For changes to engineering drawings and construction specifications) 9/23/03

Accepted [✓] Rejected [ ] Signature Project Manager Date 7/25/03 9/23/03

Concur ~ Nonconcur ~ Rework ~ USACE by Date 7/25/03

Accepted ~ Rejected ~ Rework ~ DTSC by Date 9/29/03

9/23/03 JPC 9/23/03 9/23/03 DRC DG 9/23/03

Remarks: Per DOD Guidance a source of perchlorate and an exposure pathway and receptor must all be present to justify sampling for perchlorate 9/23/03 E. 7/25/03

Final Disposition

Signature Date

northgate
environmental
management, inc.

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Field Change Request

Field Change # 3 Rev # ___
Page 1 of 3

Project Name TOURTELOT NON-OE REMEDIATION
Applicable Document NON-OERDD

Project Number 1056.03
Date 6/2/03

Description: Add STL Denver Analytical Laboratory to QAPP

Investigation and confirmation samples may be sent to STL Denver to achieve necessary turnaround times when other laboratories approved in the QAPP are unable to meet turnaround times. STL Denver will only perform analyses for which Practical Quantitation Limits (PQLs) are below the applicable Preliminary Soil Remediation Goals, Human Health or Ecological Screening Criteria presented in Tables 2-3 and 2-4 of the Non-OE RDD. Analyses that may be performed by STL Denver are presented in Attachment 1, which provides additional details of the requested change.

Minor Change [X] Major Change [ ] Major Project Impact [ ]

Requested by Deni Chambers, C.Hg., C.E.G.

Reason for Change

Laboratories previously identified in the QAPP (Appendix C of the Non-OERDD) cannot always meet rush turnaround times required for this project, due to backlog. The requested change allows STL Denver to perform certain analyses to meet project deadlines, while meeting the requirements of the QAPP. This change has been approved orally by [illegible] Kellogg of the U.S. Army Corps of Engineers in a telephone call with Deni Chambers of Northgate on June 2,

Recommended Disposition

Approval

Impact on Present and Completed Work

No Impact

Cost Impact

No Impact

Accepted [✓]	Rejected [ ]	Rework [ ]	Taylor Bennett Technical Representative	Date 6/4/03
Accepted [✓]	Rejected [ ]	Rework [ ]	Sarah Bachand Project QC Manager	Date 6/6/03
Accepted [✓]	Rejected [ ]	Rework [ ]	[illegible] Responsible Engineer	Date 6/4/03
Concur [ ]	Nonconcur [ ]	Rework [ ]	N/A chemical issues. 3rd Party QA	Date
Concur [X]	Nonconcur [ ]	Rework [ ]	[illegible] USACE	Date 9/22/03
Concur [X]	Nonconcur [ ]	Rework [ ]	[illegible] DTSC	Date 9/24/03

Remarks

Final Disposition

Signature _____ Date _____

otes:

[1] Human health screening criterion based on 95th percentile of ambient soil samples (Table 2-4a of the Non-OE RDD)
[2] US EPA Region 9 Preliminary Remediation Goal (residential) (Table 2-4a of the Non-OE RDD)
[3] US EPA Region 9 Preliminary Remediation Goal (residential) / ecological screening criterion (Tables 2-4a and 2-4b of the Non-OE RDD)
ne – none established

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Field Change Request

Field Change # 6 Rev # 0

Page 1 of 2

Project Name TOURTELOT CLEAN-UP PROJECT

Applicable Document Non-OE RDD

Project Number 1056.03

Date 9/22/2003

Description: Modify investigation and remediation procedures for the Flare Site and Demo Site 3.

This Field Change Request documents a change in procedure for investigating and remediating mercury-affected soil in the South Valley in and near the Flare Site and Demo Site 3. The high density of OE and/or OE scrap in this area made OE point-clearance infeasible. Therefore, the mercury affected soil, Flare Site, and Demo Site 3 were mechanically excavated and the excavated soil was moved to the Ridge Area for OE sifting and/or spreading and scanning as addressed by FCR #32 to the OE-RDD. Soils from the upper 18 inches outside the Flare Site and Demo Site 3 were stockpiled separately, because these soils are to be characterized using different analytical methods than will be used for the stockpiled soils from inside the Flare Site and Demo Site 3. Confirmation sampling on a grid in each area was conducted as specified in the Non-OE RDD (20-foot grid in the Flare Site and 50-foot grid in Demo Site 3) to verify that chemically affected soils were removed.

Minor Change [X] Major Change [ ] Major Project Impact [ ]

Requested by: Northgate Environmental Management, Inc.

Reason for Change: Reduce Schedule Impact for TNT Soils Processing.

The change in the investigation sampling procedure was necessary because the high density of OE and/or OE scrap in the vicinity of the Flare Site and Demo Site 3 made OE-point clearance infeasible.

Recommended Disposition:

Approval

Impact on Present and Completed Work:

Allows safe removal and clearing of soils containing OE and/or OE scrap.

Cost Impact:

A reduction in schedule and cost is expected. Amount to be determined.

Tourtelot Clean-up Project, 1056.03, Non-OE RDD FCR # 6, page 2 of 2

Accepted ☑	Rejected ☐	Rework ☐	Technical Representative	Date 9/23/03
Accepted ☑	Rejected ☐	Rework ☐	Project Manager	Date 9/23/03
Accepted ☑	Rejected ☐	Rework ☐	Responsible Engineer	Date 9/23/03
Concur ☐	Nonconcur ☐	Rework ☐	NA 3rd Party QA	Date
Concur ☒	Nonconcur ☐	Rework ☐	USACE	Date 9/23/03
Concur ☒	Nonconcur ☐	Rework ☐	DTSC	Date 9/24/03

Remarks: With the understanding that "Mercury affected soil" equals "DMS 5.4.3" 9/23/03

Final Disposition:

Signature: _____ Date: _____

APPENDIX B

Appendix B

Soil Handling Procedures

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B-1 PM10 Air Monitoring Stations
B-2 Confirmation Sample Locations North Valley

Attachments:

B-1 Air Monitoring Logs
B-2 Soil Handling Manifests
B-3 Technical Memo to DTSC re. Use of Excavated Soils from Demo Site 1 in the South Valley for Fill
B-4 Demolition Site 3 and Mercury Impacted Soil Stockpiles

APPENDIX B: SOIL HANDLING PROCEDURES

This section describes the procedures used to excavate, stockpile, and transport soils during remediation in the South Valley and Ridge Area. The remediation areas within the Ridge Area include Flare Site 2 and the Remediation Stockpiles. The remediation areas within the South Valley include Demolition Sites 1 and 3, Flare Sites 1 and 3, and the 'Halos' of affected soil surrounding Demolition Site 3 and Flare Site 1 (see discussion in Section 2.0 of the main report text).

1.0 GENERAL PROCEDURES

1.1 Excavation and Stockpiling Procedures

The excavation contractor (Pacific States Environmental Contractors, Pleasanton, California) used heavy equipment (bulldozer, scrapers, excavators, loader and on-highway and off-highway dump trucks) to excavate stockpile, and load soils.

1.2 Waste Profiling and Landfill Selection

Soils were generally characterized for disposal based on investigation sample results (see Section 2 of main text). Composite samples were collected from stockpiles for further analysis. Samples were analyzed based on landfill requirements following review of prior investigation sample results. Analytical results of non-investigation samples used for waste profiling of Ridge Area and South Valley soils are presented in tables B-1a through B-1f.

1.3 Offsite transportation Procedures

All transportation was completed in accordance with the project transportation plan (Non-OE RDD, Appendix D; Northgate 2002). The Transportation Plan describes the transportation routes, traffic control, loading procedures, record keeping, and contingency procedures for off-hauling materials from the Project Site.

Soils were transported to the landfills by DenBeste Transportation (Windsor, California). Semi trucks with end-dump trailers were utilized to transport soil to the landfill. All loads were covered with tarps during transportation, in accordance with the project transportation plan. All trucks were required to stop at an onsite decontamination pad where any loose material that may have adhered to the truck during loading activities was removed. Each vehicle was inspected by Northgate's field staff prior to departure.

Heavy equipment used for excavation and loading of chemically affected soils was decontaminated before leaving the Project Site.

1.4 Dust Control Measures

A water truck was used to control fugitive dust emissions from the Ridge Area and South Valley. Water was applied routinely in areas where vehicle traffic and heavy equipment operation had the potential to generate dust. A water truck was routinely used to wet down stockpiles as they were being loaded onto trucks for hauling. Plastic sheets were placed and secured over chemically affected stockpiled soil to mitigate dust emissions.

1.5 Air Monitoring Activities and Results

Northgate conducted ambient air monitoring during remedial activities in Flare Site 1 and Demolition Site 3. Details of the air monitoring procedures are specified in the Site-Specific Safety and Health Plan (SSHP; Earth Tech, 2000), Addendum 1 (Earth Tech, 2001), and Addendum 3 (Northgate, 2002) to the SSHP, and are summarized below.

Air monitoring was also conducted continuously during the first month of OE sifting operations at the site. Details of these air monitoring activities and results will be presented in the Final OE report.

1.5.1 Perimeter Air Monitoring

For the month of August, during excavation of chemically affected soil, air quality was monitored along the perimeter of the Site, at Gates 4, 5, and 6 (see Figure B-1). Since there were no exceedances during this period, air monitoring activities were curtailed. Air Monitoring was targeted to measure particulate emissions with an aerodynamic diameter less than or equal to 10 microns [PM_{10}]. Monitoring locations were selected to measure downwind concentrations and upwind background concentrations.

A total of three EPAM 5000 and one DR2000 air monitors were used interchangeably to obtain real-time measurements of PM_{10} concentrations. One monitor was placed at the upwind Project Site perimeter gate and two monitors were placed downwind at the Project Site perimeter gates.

Real-time electronic measurements were recorded for August 6th through September 2nd, and September 13th - 14th, during the excavation of Flare Site I and Halo soils, Demo Site 3 and Halo soils, and surface soils scraped from the faces of the South Valley. Real-time monitoring data sheets are presented in attachment B-1. In addition, sample filters were taken from the air monitors for each day of monitoring for gravimetric measurements, and placed in labeled containers indicating the filter sample ID. Filter samples were sent to EMS Laboratories (Los Angeles, California) under chain-of-custody protocol, indicating the date, sample location, sample collection time, and total air volumetric flow through the sampler.

The average dust concentration at the upwind and downwind boundary monitoring locations was calculated based on measurement of total collected mass using the NIOSH 500 gravimetric analysis method. The gravimetric analyses data are presented in EMS reports 89145 and 89984 (Attachment B-1). Consistent with the PM_{10} monitoring data, gravimetric measurements from each day show that the average downwind concentrations (minus upwind background concentrations) did not exceed 0.15 mg/m3, the action level specified in the Site Specific Health and Safety Plan Addendum 1. The air monitoring sampling dates and results are summarized in Table B-2.

1.5.2 Work Area Air Monitoring

Work area air quality measurements were carried out during excavation activities in Flare Site 1 and Demo Site 3 areas, from August 6th to August 31st, 2003, using two DR2000 air monitors placed immediately upwind and downwind of the excavation area. Real-time electronic measurements were recorded for each day of work area monitoring.

Results from each day show that the downwind concentrations (minus upwind background concentrations) did not exceed 1.00 mg/m3. Real-time work area monitoring data sheets are presented in Attachment B-1.

Pacific States conducted worker breathing zone dust monitoring of PM_{10} emissions using Mini-RAM personal air monitors. Two workers kept the Mini-RAM monitors in their breathing zones and recorded PM_{10} dust concentrations by hand every 30 minutes on log sheets. Daily monitoring results show that breathing zone dust concentrations did not exceed 1.00 mg/m^3. In some instances, workers lost the log sheets but verbally reported no exceedences. Daily log sheets are presented with real-time work area monitoring data sheets in Attachment B-1.

1.6 South Valley Soil Disposal

1.6.1 Flare Site 1 and Halo Soils

Flare Site 1 and associated halo soils were excavated between August 6th, and 14th, 2003 and transported to the Ridge Area for OE clearance. Approximately 500 cubic yards (cy) of Flare Site I soil and 2,500 cy of Flare Site 1 Halo soils were stockpiled separately on plastic sheeting. Composite soil samples from these stockpiles were collected on August 20th, 2003, in accordance with landfill requirements, for waste profiling.

Based on soil sampling and analysis results, the material from Flare Site I was classified for disposal as a Class I waste. The Flare Site I Stockpile was transported to the Kettleman City landfill, operated by Chemical Waste Management, Inc., on October 28 and 29, 2003. Copies of the Hazardous Waste Manifests are presented in Attachment B-2 to this Appendix.

Based on soil sampling and analysis results, the material from the Flare Site I Halo Stockpile was classified for disposal as a class II waste. Approximately 2,500 cy of soil from the Flare Site 1 Halo stockpile were transported to Keller Canyon landfill (Pittsburgh, California) on October 15 and 16, 2003. Copies of the Non-Hazardous Waste Manifests are presented in Attachment B-2 to this Appendix. Confirmation sampling was conducted to verify the removal of chemically affected soil.

1.6.2 Flare Site 3

Flare Site 3 was excavated on October 22 and 23, 2003, and stockpiled in the Ridge Area for OE clearance. A composite soil sample was collected from the stockpile on October 15th, for waste profiling purposes. Based on soil sampling and analysis results, the Flare Site 3 material was classified for disposal as a Class II waste at the Keller Canyon landfill, following sifting for OE clearance. Soil offhaul and disposal is discussed below in section 1.7.1

1.6.3 Demolition Site 1

Demolition Site 1 was excavated in November, 2003, and stockpiled in the Ridge Area for OE clearance. Composite soil samples were collected from the stockpile on November 6, 2003, for waste profiling purposes. Soil sampling and analysis results, and a screening-level health risk assessment for the excavated soils, were presented in a technical memorandum dated December 9th, 2003 (Attachment B-3 to this appendix), to Rizgar Ghazi and Brian Davis of the DTSC. Verbal approval for use of the soil from Demolition Site 1 as fill in the North Valley, was given on January 6th, 2004, by Rizgar Ghazi of the DTSC.

1.6.4 Demolition Site 3 and Halo Soils

Demolition Site 3 and associated Halo soils were excavated between August 8th and August 22nd, 2003, and August 30th and August 31st, 2003. Excavated soils from the two areas were stockpiled separately in the Ridge Area for further OE clearance. Ten composite soil samples were collected from each stockpile on August 20th, 2003, for waste profiling. Soil sampling and analysis results, and a screening-level health risk assessment for the excavated soils, were presented in a technical memorandum dated September 25th, 2003 (Attachment B-4 to this appendix), to Rizgar Ghazi and Brian Davis of the DTSC. Verbal approval for use of the soil from both the Demolition Site 3 and Halo soil stockpiles as fill in the North Valley, was given on November 17th, 2003, by Rizgar Ghazi of the DTSC.

1.6.5 Blow-In-Place Locations

Blow-in-place (BIP) locations were excavated (approximately 6 cy) and stockpiled in the Ridge Area within the footprint of the Former Remediation Stockpiles as presented in section 2.0 of the main text. The soil from the BIP excavations was profiled for disposal using investigation sample results, and was accepted for disposal as a Class II waste at Keller Canyon Landfill (Pittsburgh, CA) on July 24, 2003.

1.7 Ridge Area Soil Disposal

1.7.1 Flare Site 2

Flare Site 2 was excavated in September and October of 2003. Composite soil samples were collected from the stockpile on October 16th, 2003, for waste profiling purposes. Based on soil sampling and analysis results, the Flare Site 2 material was accepted for disposal as a Class II waste at the Keller Canyon landfill.

The Flare Site 2 soil was sifted to separate OE and OE scrap from the soil, and the sifted Flare Site 2 soil was stockpiled together with sifted soil from Flare Site 3 (see above) in the Ridge Area to await off-site disposal. On December 17th, 2003, approximately 850 cy of the sifted Flare Site 2 and 3 soils were mistakenly placed as fill in the North Valley, as reported in a letter to Rizgar Ghazi of the DTSC dated January 12th, 2004, sent by Joe L. Bird of Northgate. As reported in the January 12th letter, the location of the Flare Sites 2 and 3 soil was determined, and the soil was over excavated and stockpiled in the TNT area for off-site disposal.

Approximately 1530 cy (102 truckloads @ approximately 15 cy/truckload) of soil from Flare Sites 2 and 3 were transported to the Keller Canyon Landfill (Pittsburgh, California) on January 22-23, 2004. Copies of the Non-Hazardous Waste Manifests are presented in Attachment B-2 to this Appendix. Confirmation sampling in the North Valley and the TNT areas was conducted to verify the removal of chemically affected soil.

1.7.2 North Valley Remediation Stockpiles

North Valley Stockpiles were sampled for waste characterization in April, 2003. Based on soil sampling and analysis results, the soil from North Valley Stockpiles was accepted for disposal as a Class II waste. A portion of the affected soil was spread and scanned for OE and removed from the site during April 2002. The remainder, approximately 13,000 cubic yards (cy) of soil, was relocated to the Ridge Area and stockpiled together for OE sifting (North Valley Non-OE Remediation Report; Northgate, 2003).

Approximately 1,000 cy of soil from Area 1 in the North Valley was excavated and transported to the Ridge Area on June 8th, 2003. The Area 1 soil was stockpiled and covered with plastic to await OE clearance. Composite soil samples were collected from the Area 1 stockpile on June 13th and August 20th, 2003, for waste profiling purposes. Based on soil sampling and analysis results, the material from Area 1 was accepted for disposal as a Class II waste.

Approximately 3,000 cy of soil excavated from Area 2 in the North Valley was excavated and transported to the Ridge Area, on June 9th, 2003, and on July 22nd and 28th, 2003. The Area 2 soil was stockpiled and covered with plastic to await OE clearance. Composite soil samples were collected from the Area 2 stockpile on June 13th, 2003, for waste profiling purposes. Based on soil sampling and analysis results, the material from Area 2 was accepted for disposal as a Class II Waste.

Approximately 17,000 cy soil from Area 1, Area 2, and Former North valley Stockpiles 1, 2, and 3 were transported to the Keller Canyon landfill (Pittsburgh, California) between September 17th and October 15th, 2003. Copies of the Non-Hazardous Waste Manifests are presented in Attachment B-2 to this Appendix. Confirmation sampling was conducted to verify the removal of chemically affected soil.

1.8 Confirmation Sampling

Confirmation sampling was conducted to assess if the removal of chemically affected soil was completed in the Ridge Area stockpile footprints as presented in section 2.2.2 of the main text.

After excavation of the soils from Flare Sites 2 and 3 that was inadvertently placed in the North Valley, the North Valley Fill Area footprint and the TNT Area stockpile footprint were sampled on a 40-foot grid on January 30th, 2004. Confirmation sample results are shown in tables B-3a through B-3c. Analytical results for the confirmation samples collected in the North Valley and TNT areas for these footprints were verbally reported to the DTSC and will be assessed in the Site Wide risk assessment.

2.0 REFERENCES

Earth Tech 2000, Tourtelot Cleanup Project Site-Specific Safety and Health Plan, Benicia, California. September 29.

_____ 2001. Addendum 1, Tourtelot Cleanup Project, Site-Specific Safety and Health Plan, Benicia, California. May 25, 2001 (revised April 19, 2002).

Northgate Environmental Management, Inc. 2002. Addendum 3, Tourtelot Cleanup Project, Site Specific Safety and Health Plan, Non-Ordinance and Explosives Remediation.

_____ 2002. Final Non-Ordinance and Explosives Remedial Design Document. June 7.

TABLES

Table B-1a
Remediation Stockpiles Waste Classification Samples
Metals Analytical Results - Soil and Water

Sample ID	Date Sampled	Units	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Flare Site 1																			
SS-F1SP1-001	21-Aug-03	mg/Kg	3.3 J	4.5 J	230	<0.52 UJ	0.71 J	32 J	10 J	130	400	NA	<1 UJ	34 J	<2.1 UJ	<1 UJ	<1 UJ	47 J	200 J
SS-F1SP1-002	21-Aug-03	mg/Kg	3.1 J	3.4 J	370	<0.53 UJ	1.2 J	31 J	13 J	130	440	NA	<1.1 UJ	36 J	<2.1 UJ	<1.1 UJ	<1.1 UJ	46 J	140 J
SS-F1SP2-001	21-Aug-03	mg/Kg	<2.1 UJ	2.1 J	160	<0.53 UJ	<0.53 UJ	34 J	12 J	70	37	NA	<1.1 UJ	37 J	<2.1 UJ	<1.1 UJ	<1.1 UJ	48 J	100 J
SS-F1SP2-002	21-Aug-03	mg/Kg	<2.1 UJ	2.4 J	160	<0.53 UJ	<0.53 UJ	33 J	11 J	73	24	NA	<1.1 UJ	34 J	<2.1 UJ	<1.1 UJ	<1.1 UJ	52 J	69 J
SS-F1SP2-003	21-Aug-03	mg/Kg	<2.2 UJ	1.6 J	170	<0.55 UJ	<0.55 UJ	32 J	10 J	64	44	NA	<1.1 UJ	33 J	<2.2 UJ	<1.1 UJ	<1.1 UJ	52 J	68 J
Demolition Site 1																			
SS-1DSP-001	06-Nov-03	mg/Kg	<2.4 R	10 J	220 J	0.51 J	0.02 J	40 J	22 J	59 J	18 J	0.29 J	0.44 J	54 J	0.44 J	0.28 J	<1.2 UJ	52 J	72 J
SS-1DSP-002	06-Nov-03	mg/Kg	<2.5 R	9.5 J	190 J	0.53 J	<0.62 UJ	40 J	14 J	58 J	16 J	0.091 J	0.4 J	40 J	<2.5 J	0.17 J	0.73 J	51 J	70 J
SS-1DSP-003	06-Nov-03	mg/Kg	<2.3 R	8.7 J	190 J	0.49 J	0.028 J	37 J	16 J	58 J	17 J	0.084 J	0.33 J	41 J	<2.3 J	0.19 J	<1.1 UJ	49 J	93 J
SS-1DSP-502	06-Nov-03	mg/Kg	<2.3 R	8.2 J	160 J	0.45 J	0.017 J	36 J	12 J	62 J	21 J	0.094 J	0.28 J	35 J	0.6 J	0.16 J	<1.2 UJ	51 J	70 J
Demolition Site 3																			
SS-3DSP1-001	20-Aug-03	mg/Kg	<2 R	13	270	0.32 J	<0.54	8.4 J	16	53 J	16	0.26 J	<1 UJ	33	<2.1	<1.1	<1.1	22 J	90 J
SS-3DSP1-002	20-Aug-03	mg/Kg	<2 R	13	300	0.26 J	0.61	7.3 J	18	59 J	49	0.71 J	<1 UJ	30	<2.1	<1	<1	21 J	94 J
SS-3DSP1-003	20-Aug-03	mg/Kg	<2 R	12	250	0.25 J	0.76	8.1 J	21	89 J	57	2.8 J	<1 UJ	40	<2.1	<1	<1	21 J	110 J
SS-3DSP1-004	20-Aug-03	mg/Kg	1.9 J	14	250	0.26 J	1.2	8.9 J	19	110 J	78	3.1 J	0.62 J	39	<2.2	<1.1	<1.1	22 J	130 J
SS-3DSP1-005	20-Aug-03	mg/Kg	<2 R	16	180	0.26 J	<0.53	8.3 J	25	63 J	8.1	0.33 J	<1 UJ	39	<2.1	<1.1	<1.1	20 J	99 J
SS-3DSP1-006	20-Aug-03	mg/Kg	<2 R	12	280	0.27 J	0.73	7.5 J	22	58 J	20	0.92 J	<1 UJ	34	<2.1	<1.1	<1.1	22 J	93 J
SS-3DSP1-007	20-Aug-03	mg/Kg	<2 R	13	280	0.31 J	<0.53	8.2 J	24	51 J	19	0.18 J	<1 UJ	45	<2.1	<1.1	<1.1	20 J	87 J
SS-3DSP1-008	20-Aug-03	mg/Kg	<2 R	15	240	0.21 J	0.86	6.8 J	18	67 J	22	0.56 J	<1 UJ	32	<2.2	<1.1	<1.1	21 J	94 J
SS-3DSP1-009	20-Aug-03	mg/Kg	<2 R	14	230	0.28 J	<0.53	8.3 J	18	72 J	17	1.4 J	<1 UJ	40	<2.1	<1.1	<1.1	20 J	110 J
SS-3DSP1-010	20-Aug-03	mg/Kg	1 J	13	240	0.26 J	1.7	8.6 J	18	270 J	58	3.6 J	<1 UJ	41	<2.1	<1.1	<1.1	21 J	190 J
SS-3DSP2-001	20-Aug-03	mg/Kg	<2 R	13	260	0.35 J	<0.54	9.3 J	18	67 J	26	0.88 J	<1 UJ	42	<2.2	<1.1	<1.1	21 J	110 J
SS-3DSP2-002	20-Aug-03	mg/Kg	<2 R	14	270	0.35 J	0.6	9.2 J	18	67 J	34	0.91 J	0.54 J	40	<2.2	<1.1	<1.1	22 J	110 J
SS-3DSP2-003	20-Aug-03	mg/Kg	<2 R	13	230	0.3 J	<0.53	8.2 J	17	55 J	28	0.75 J	<1 UJ	36	<2.1	<1.1	<1.1	21 J	87 J
SS-3DSP2-004	20-Aug-03	mg/Kg	<2 R	13	240	0.28 J	<0.54	8.5 J	17	56 J	30	0.55 J	<1 UJ	36	<2.2	<1.1	<1.1	22 J	89 J
SS-3DSP2-005	20-Aug-03	mg/Kg	<2 R	12	250	0.42 J	<0.54	8 J	18	53 J	21	1.7 J	0.2 J	33	<2.2	<1.1	<1.1	21 J	85 J
SS-3DSP2-006	20-Aug-03	mg/Kg	<2 R	13	240	0.27 J	0.85	11 J	21	110 J	41	0.47 J	0.083 J	51	<2.2	<1.1	<1.1	19 J	140 J
SS-3DSP2-007	20-Aug-03	mg/Kg	<2 R	11	210	0.35 J	<0.57	7.4 J	18	45 J	16	0.27 J	<1 UJ	29	<2.3	<1.1	<1.1	22 J	76 J
SS-3DSP2-008	20-Aug-03	mg/Kg	<2 R	11	240	0.34 J	<0.54	9.2 J	16	49 J	13	1.6 J	<1 UJ	39	<2.2	<1.1	<1.1	21 J	82 J
SS-3DSP2-009	20-Aug-03	mg/Kg	<2 R	14	260	0.31 J	0.84	10 J	18	78 J	22	1.2 J	<1 UJ	43	<2.2	<1.1	<1.1	22 J	110 J
SS-3DSP2-010	20-Aug-03	mg/Kg	<2 R	12	260	0.3 J	<0.54	8.5 J	16	54 J	20	1.1 J	<1 UJ	35	<2.2	<1.1	<1.1	21 J	88 J
Flare Site 2																			
SS-F3SP-001-000	15-Oct-03	mg/Kg	<2.1 R	7.5 J	200 J	<0.52 UJ	0.58 J	26 J	12 J	39 J	24 J	0.077	<1 UJ	23 J	<2.1 UJ	<1	<1 UJ	58 J	59 J
North Valley Remediation Stockpiles																			
SS-NVWC-011-001.5	13-Jun-03	mg/Kg	0.41 J	20.2	314	0.94	0.16 J1	75.6 J	28.2 J	82.6 J	17.6	0.069	0.91 J1	75.2 J	2.2 J1	<0.57	<1.1	121 J	107 J
SS-NVWC-012-001.5	13-Jun-03	mg/Kg	0.58 J	21.3	374	0.94	0.13 J1	78.3 J	29.7 J	89.4 J	17.2	0.079	1.1 J1	73.1 J	2 J1	<0.59	0.78 J1	133 J	119 J

Table B-1a
Remediation Stockpiles Waste Classification Samples
Metals Analytical Results - Soil and Water

Sample ID	Date Sampled	Units	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
SS-NVWC-013	20-Aug-03	mg/Kg	<2.1	NA	NA	0.37 J1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
SS-NVWC-014	20-Aug-03	mg/Kg	<2.2	NA	NA	0.42 J1	NA	NA	NA	NA	NA	NA	<1.1	NA	NA	NA	NA	NA	NA

Sample ID	Date Sample	Units	WET Barium	WET Lead
Flare Site 1				
SS-F1SP1-001	21-Aug-03	mg/L	NA	1.6
SS-F1SP1-002	21-Aug-03	mg/L	NA	0.5
SS-F1SP2-002	21-Aug-03	mg/L	NA	0.91
SS-F1SP2-003	21-Aug-03	mg/L	NA	2.6
Flare Site 2				
SB-RSPWC-001	31-Jul-03	mg/L	7	NA
SS-F2SP-001-000	16-Oct-03	mg/L	84	NA
SS-F2SP-001-500	16-Oct-03	mg/L	72	NA
SS-F2SP-002-000	16-Oct-03	mg/L	62	NA
North Valley Remediation Stockpiles - Area 1				
SS-NVWC-013	20-Aug-03	mg/L	NA	<0.52
SS-NVWC-014	20-Aug-03	mg/L	NA	<0.53

Notes:
Metals analyzed using EPA Method 6010B/7471A.

J1	The concentration is approximate because it is less than the reporting limit.
J	The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
mg/kg	milligram per kilogram
mg/L	milligram per liter
NA	Not analyzed
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.

Table B-1b
Remediation Stockpiles Waste Classification Samples

Miscellaneous Analytical Results - Soil

(concentrations expressed in mg/kg)

Sample ID	DateSampled	TPH (as Diesel)	TPH (as Kerosene)	TPH (as Motor Oil)	Nitrate	Nitrite	Nitrate/Nitrite
SS-RAF2-001,002,003,004	09/04/02	2.7	NA	<50	14	<10	NA
SS-SVF3-003	11/14/02	<1.299	NA	<64	NA	NA	0.18 UJ
SS-SVF3-004	11/14/02	<1.299	NA	<66	NA	NA	0.33 UJ

Notes:

mg/kg	milligram per kilogram
NA	Not analyzed
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.

Table B-1c
Remediation Stockpiles Waste Classification Samples
PAH Analytical Results - Soil
(concentrations expressed in ug/kg)

Sample ID	DateSampled	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
Flare Site 3																	
SS-SVF3-003	11/14/02	<13	<13	<6	<6	<6	<6	<13	<6	<6	<13	<6	<6	<13	<19	<6	<6
SS-SVF3-004	11/14/02	<13	<13	<6	<6	<6	<6	<13	<6	<6	<13	<6	<6	<13	<2	<6	<6
Demolition Site 1																	
SS-1DSP-001	11/06/03	<12	<12	<5.9	<5.9	<5.9	<5.9	<12	<5.9	<5.9	<12	<5.9	<5.9	<12	<24	<5.9	<5.9
SS-1DSP-002	11/06/03	<12	<12	<6.2	<6.2	<6.2	<6.2	<12	<6.2	<6.2	<12	<6.2	<6.2	<12	<25	<6.2	<6.2
SS-1DSP-003	11/06/03	<11	<11	<5.7	<5.7	<5.7	<5.7	<11	<5.7	<5.7	<11	<5.7	<5.7	<11	<23	<5.7	<5.7
SS-1DSP-502	11/06/03	<12	<12	<5.8	<5.8	<5.8	<5.8	<12	<5.8	<5.8	<12	<5.8	<5.8	<12	<23	<5.8	<5.8
Flare Site 2																	
SS-RAF2-001,002,003,004	09/04/02	<10	<10	<5	<5	<5 UJ	<5	<10	<5	<5	<10	<5	<5	<10	<15 UJ	<5	<5

Notes:

UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
PAHs	Polynuclear aromatic hydrocarbons analyzed using method EPA 8310.
ug/kg	micrograms per kilogram

Table B-1d
Remediation Stockpiles Waste Classification Samples
PCB Analytical Results - Soil
(concentrations expressed in mg/kg)

Sample ID	Sample Date	PCBs						
		Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Flare Site 3								
SS-SVF3-003	11/14/02	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SS-SVF3-004	11/14/02	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065
Flare Site 2								
SS-RAF2-001,002,003,004	9/4/02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

mg/kg milligram per kilogram

PCBs Polychlorinated biphenyls analyzed using EPA method 8082.

Sample IDs: SS-RAF2-001,002,003,004 denotes a surface soil confirmation sample; -RAF2 is a location identifier indicating the sample was collected from the Flare Site 2 sector of the Ridge Area, -001 is the location number; and -001 indicates the sample was collected 1 foot below the original excavation surface after an additioal 1-foot lift of soil was removed.

Table B-1e
Remediation Stockpiles Waste Classification Samples
Explosives Analytical Results - Soil
(concentrations expressed in mg/kg)

Sample ID	DateSampled	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotolu	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-dinitrotolu	4-Nitrotoluene	HMX	Nitrobenzene	Nitroglycerin	PETN	RDX	Tetryl
Flare Site 3																	
SS-SVF3-003	11/14/02	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-SVF3-004	11/14/02	0.02 J1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.068 J1	<0.5	<0.5	<0.25	<0.25
Demolition Site 1																	
SS-1DSP-001	11/06/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-1DSP-002	11/06/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-1DSP-003	11/06/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
SS-1DSP-502	11/06/03	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25
Flare Site 2																	
SS-RAF2-001,002,003,00	09/04/02	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25

Notes:
mg/kg milligram per kilogram
J1 The concentration is approximate because it is less than the reporting limit

Table B-1f
Remediation Stockpiles Waste Classification Samples
Dioxin and Furan Analytical Results - Soil
(concentrations expressed in pg/g)

Sample ID	Date Sampled	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF
Flare Site 1																		
SS-F1SP1-001	08/21/03	28	18	<2.2	<2.2	9	5.4	6.8	4.9	<1	<2.2	6.8	11	16	<0.85	6.2	38	5.6
Demolition Site 1																		
SS-1DSP-002	11/06/03	<1	<0.71	<0.35	<0.23	<0.23	<0.22	<0.2	<0.2	<0.22	<0.37	<0.2	<0.2	<0.2	<0.4	<0.36	<4.9	<0.41
SS-1DSP-003	11/06/03	<1.8	<2.1	<0.32	<0.19	<1.8	<0.33	<0.72	<0.59	<0.18	<0.23	<0.82	<1.1	<1.2	<0.38	0.99	<5.2	<1.2
Demolition Site 3																		
SS-3DSP1-010	08/20/03	55	6.2	<0.65	<0.59	<0.53	<1.5	<0.3	<1	<0.4	<0.74	<0.49	<0.36	<0.49	<0.47	<0.49	370	26
SS-3DSP2-002	08/20/03	30	<2.4	<0.66	<1.4	<0.79	<1.2	<0.67	<1.6	<0.92	<2.1	<1.3	<0.82	<1.3	<0.37	<1	190	9.4

Notes:

pg/g	picograms per gram
J	The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.

Table B-2
Summary of PM10 Perimeter Airborne Dust Monitoring, South Valley
Tourtelot Cleanup Project, Benicia, CA

Sample Date	Location (Gate #)	Location (Wind)	Laboratory Analysis of PM10 membrane filter [1] Sample ID	Report	Volume (L)	Weight (mg)	Concentration (mg/m3)	Real Time Electronic Measurement Start-End time (hr:min-hr:min)	Elapsed time (min)	Avg Concentration (mg/m3)	Average Downwind - Upwind Concentration Electronic Data (mg/m3)	Gravimetric Filter Analysis (mg/m3)
08/06/03	4	upwind	PVC-039	89145	1178	<0.03	<0.03	7:13-17:02	589	0.011	-	-
08/06/03	6	downwind	Filter 93	89145	2324	0.11	0.05	7:05-16:46	581	0.033	0.02	0.05
08/08/03	4	upwind	PVC-035	89145	1124	<0.03	<0.03	7:25-16:44	562	NA	-	-
08/08/03	5	downwind	Filter 90	89145	2124	0.04	0.02	6:55-15:46	531	0.018	NA	0.02
08/08/03	6	downwind	Filter 91	89145	2148	0.05	0.02	7:18-17:15	537	NA	NA	0.02
08/09/03	5	downwind	Filter 96	89145	1028	0.07	0.07	7:51-12:08	257	0.03	NA	NA
08/09/03	6	downwind	PVC-037	89145	508	0.04	0.06	8:03-12:17	254	NA	NA	NA
08/11/03	4	upwind	Filter 120	89984	2212	0.06	0.03	8:20-17:33	553	0.022	-	-
08/11/03	5	downwind	PVC-040	89984	1110	0.09	0.08	8:10-17:25	555	0.047	0.03	0.05
08/11/03	6	downwind	Filter 97	89984	2300	0.07	0.03	7:40-17:15	575	NA	NA	ND
08/12/03	4	upwind	Filter 110	89984	2196	0.07	0.03	8:07-17:16	549	0.016	-	-
08/12/03	5	downwind	Filter 99	89984	2276	<0.03	<0.01	7:47-17:16	569	NA	NA	ND
08/12/03	6	downwind	PVC-041	89984	1140	0.06	0.05	7:30-17:00	570	0.02	ND	0.02
08/13/03	4	upwind	Filter 106	89984	2308	0.04	0.02	7:41-17:18	577	0.007	-	-
08/13/03	5	downwind	Filter 108	89984	2316	0.03	0.01	7:38-17:17	579	NA	NA	ND
08/13/03	6	downwind	PVC-042	89984	1162	0.05	0.04	7:16-16:57	581	0.017	0.02	0.01
08/14/03	4	upwind	Filter 98	89984	2272	<0.03	<0.01	8:02-17:30	568	0.007	-	-
08/14/03	5	downwind	Filter 95	89984	2400	0.04	0.02	7:40-17:40	600	0.019	0.01	0.02
08/14/03	6	downwind	PVC-036	89984	1202	0.06	0.05	7:12-17:13	601	0.031	0.02	0.05
08/15/03	4	upwind	Filter 105	89984	2284	0.08	0.04	7:38-17:09	571	NA	-	-
08/15/03	5	downwind	PVC-043	89984	1224	0.07	0.06	7:29-17:41	612	0.021	NA	NA
08/15/03	6	downwind	Filter 104	89984	2440	<0.03	<0.01	7:29-17:39	610	0.025	NA	NA
08/16/03	4	upwind	PVC-044	89984	1086	0.07	0.06	7:23-16:26	543	0.014	-	-
08/16/03	5	downwind	Filter 125	89984	2180	<0.03	<0.01	7:10-16:15	545	NA	NA	ND
08/16/03	6	downwind	Filter 119	89984	2732	<0.03	<0.01	7:09-16:52	583	0.02	0.01	ND
08/18/03	4	upwind	PVC-046	89984	1094	0.05	0.05	7:55-17:02	547	0.006	-	-
08/18/03	5	downwind	Filter 112	89984	2352	<0.03	<0.01	7:30-17:18	588	NA	NA	ND
08/18/03	6	downwind	Filter 122	89984	2300	<0.03	<0.01	7:28-17:03	575	0.031	0.03	ND
08/19/03	5	upwind	Filter 145	89984	2488	<0.03	<0.01	7:26-17:48	622	0.027	NA	NA
08/19/03	6	downwind	PVC-047	89984	1246	0.04	0.03	7:17-17:40	623	0.019	NA	NA
08/20/03	4	upwind	Filter 102	89984	2396	<0.03	<0.01	7:01-17:00	599	0.016	-	-
08/20/03	5	downwind	Filter 109	89984	2324	0.03	0.01	7:41-17:22	581	0.009	ND	0.01
08/20/03	6	downwind	PVC-048	89984	1212	0.03	0.02	7:22-17:28	606	0.026	0.01	0.02
08/21/03	5	downwind	Filter 113	89984	2180	<0.03	<0.01	7:21-16:26	545	0.025	NA	NA
08/21/03	6	downwind	PVC-049	89984	1084	0.03	0.03	7:15-16:17	542	0.021	NA	NA

Table B-2
Summary of PM10 Perimeter Airborne Dust Monitoring, South Valley
Tourtelot Cleanup Project, Benicia, CA

Sample Date	Location (Gate #)	Location (Wind)	Laboratory Analysis of PM10 membrane filter [1] Sample ID	Report	Volume (L)	Weight (mg)	Concentration (mg/m3)	Real Time Electronic Measurement Start-End time (hr:min-hr:min)	Elapsed time (min)	Avg Concentration (mg/m3)	Average Downwind - Upwind Concentration Electronic Data (mg/m3)	Gravimetric Filter Analysis (mg/m3)
08/22/03	5	downwind	Filter 133	89984	2368	<0.03	<0.01	7:10-17:02	592	0.017	NA	NA
08/22/03	6	downwind	PVC-050	89984	1156	0.03	0.03	7:36-17:14	578	0.016	NA	NA
08/23/03	5	downwind	Filter 136	89984	1796	<0.03	<0.02	7:49-15:18	449	0.006	NA	NA
08/23/03	6	downwind	PVC-051	89984	914	0.06	0.07	7:39-15:16	457	0.017	NA	NA
08/25/03	4	upwind	Filter 114	89984	2224	<0.03	<0.01	7:55-17:11	556	NA	-	-
08/25/03	5	downwind	Filter 132	89984	2300	<0.03	<0.01	7:40-17:15	575	0.014	NA	NA
08/25/03	6	downwind	PVC-057	89984	1208	0.03	0.02	7:21-17:25	604	0.034	NA	NA
08/26/03	4	upwind	Filter 127	89984	2232	<0.03	<0.01	7:59-17:17	558	0.019	-	-
08/26/03	5	downwind	Filter 138	89984	2356	<0.03	<0.01	7:37-17:26	589	0.014	ND	ND
08/26/03	6	downwind	PVC-052	89984	1202	0.03	0.02	7:29-17:30	601	0.025	0.01	0.02
08/27/03	4	upwind	Filter 103	89984	2152	<0.03	<0.01	7:54-16:52	538	0.018	-	-
08/27/03	5	downwind	Filter 101	89984	2240	<0.03	<0.01	7:33-16:53	560	NA	NA	ND
08/27/03	6	downwind	PVC-054	89984	1178	0.04	0.03	7:19-17:08	589	0.033	0.02	0.03
08/28/03	4	upwind	Filter 117	89984	2236	<0.03	<0.01	7:57-17:16	559	0.02	-	-
08/28/03	5	downwind	Filter 111	89984	2332	<0.03	<0.01	7:35-17:18	583	NA	NA	ND
08/28/03	6	downwind	PVC-055	89984	1058	0.05	0.05	7:28-16:57	529	0.016	ND	0.05
08/29/03	4	upwind	Filter 128	89984	2136	<0.03	<0.01	7:38-17:12	534	0.035	-	-
08/29/03	5	downwind	Filter 129	89984	2088	<0.03	<0.01	7:40-17:02	522	NA	NA	ND
08/29/03	6	downwind	PVC-060	89984	1052	0.04	0.04	7:19-16:45	526	0.032	ND	0.04
08/30/03	4	upwind	Filter 143	89984	1960	<0.03	<0.02	8:30-16:40	490	0.125	-	-
08/30/03	5	downwind	Filter 116	89984	2028	<0.03	<0.01	8:15-16:42	507	NA	NA	ND
08/30/03	6	downwind	PVC-059	89984	1268	<0.03	<0.02	6:30-17:04	634	0.024	ND	ND
08/31/03	4	upwind	Filter 141	89984	2312	<0.03	<0.01	6:51-16:29	578	0.017	-	-
08/31/03	5	downwind	Filter 142	89984	2304	<0.03	<0.01	6:59-16:35	576	NA	NA	ND
08/31/03	6	downwind	PVC-058	89984	1222	<0.03	<0.02	6:34-16:45	611	0.03	0.01	ND
09/02/03	4	upwind	Filter 94	89984	2352	<0.03	<0.01	7:24-17:12	588	NA	-	-
09/02/03	5	downwind	Filter 100	89984	2348	<0.03	<0.01	7:27-17:14	587	0.022	NA	ND
09/02/03	6	downwind	PVC-056	89984	1238	<0.03	<0.02	7:06-17:25	619	0.036	NA	ND

1 Detection Limit = 0.03 mg
2 Wind shifted direction in afternoon; blew in opposite direction.
ND Not detected
NA Not analyzed

T[illegible] B-3a
Flare Sites 2 and 3 Stockpile Footprint Samples
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Date Sampled	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
SS-F23SF-002	01/22/04	20000	<2 UJ	9.7 J	210 J	<0.5 UJ	<0.5 UJ	6800	31 J
SS-F23SF-003	01/22/04	20000	<2 UJ	9.3 J	170 J	<0.5 UJ	<0.5 UJ	3100	33 J
SS-F23SF-004	01/22/04	22000	<2 UJ	8.8 J	170 J	<0.5 UJ	<0.5 UJ	3500	32 J
SS-F23SF-005	01/22/04	23000	<2 UJ	10 J	170 J	<0.5 UJ	<0.5 UJ	3200	34 J
SS-F23SF-006	01/22/04	21000	<2 UJ	9.7 J	190 J	<0.5 UJ	<0.5 UJ	7300	37 J
SS-F23SF-007	01/22/04	20000	<2 UJ	9.9 J	190 J	<0.5 UJ	<0.5 UJ	6700	32 J
SS-F23SF-008	01/22/04	20000	<2 UJ	10 J	200 J	<0.5 UJ	<0.5 UJ	6200	34 J
SS-F23SF-009	01/22/04	21000	<2 UJ	9.9 J	220 J	<0.5 UJ	<0.5 UJ	5400	33 J
SS-F23SF-010	01/22/04	21000	<2 UJ	9.5 J	210 J	<0.5 UJ	0.54 J	6900	32 J
SS-F23SF-011	01/22/04	21000	<2 UJ	5.9 J	140 J	<0.5 UJ	<0.5 UJ	2800	33 J
SS-F23SF-1SW	01/22/04	21000	<2 UJ	9.5 J	140 J	<0.5 UJ	<0.5 UJ	2600	31 J
SS-F23SF-2SW	01/22/04	19000	<2 UJ	7 J	170 J	<0.5 UJ	<0.5 UJ	2800	33 J
SS-F23SF-3SW	01/22/04	19000	<2 UJ	8.6 J	120 J	<0.5 UJ	<0.5 UJ	3000	35 J
SS-F23SF-509	01/22/04	21000	<2 UJ	11 J	290 J	<0.5 UJ	<0.5 UJ	11000	32 J
SS-F23SF-012	01/30/04	NA	<2.5 R	13 J	180 J	<0.63 UJ	<0.63 UJ	NA	39 J
SS-F23SF-013	01/30/04	NA	<2.2 R	12 J	170 J	<0.56 UJ	<0.56 UJ	NA	33 J
SS-F23SF-014	01/30/04	NA	<2.3 R	12 J	190 J	0.58 J	<0.58 UJ	NA	43 J

Table B-3a
Flare Sites 2 and 3 Stockpile Footprint Samples
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Date Sampled	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel
SS-F23SF-002	01/22/04	14 J	46	31000	7.5 J	6900	990	0.11 J	<1 UJ	35 J
SS-F23SF-003	01/22/04	14 J	39	29000	8.3 J	4700	790	0.13 J	<1 UJ	28 J
SS-F23SF-004	01/22/04	13 J	39	32000	8.2 J	5200	890	0.11 J	<1 UJ	28 J
SS-F23SF-005	01/22/04	14 J	41	35000	8.1 J	5400	1200	0.094 J	<1 UJ	33 J
SS-F23SF-006	01/22/04	14 J	47	34000	7.6 J	7700	920	0.11 J	<1 UJ	40 J
SS-F23SF-007	01/22/04	13 J	47	33000	8.5 J	6700	820	0.1 J	<1 UJ	33 J
SS-F23SF-008	01/22/04	15 J	49	33000	8 J	7000	830	0.11 J	<1 UJ	36 J
SS-F23SF-009	01/22/04	15 J	45	33000	9.9 J	6600	1000	0.12 J	<1 UJ	32 J
SS-F23SF-010	01/22/04	12 J	45	32000	16 J	6000	650	0.086 J	<1 UJ	27 J
SS-F23SF-011	01/22/04	14 J	49	32000	4.8 J	7000	500	0.061 J	<1 UJ	32 J
SS-F23SF-1SW	01/22/04	12 J	44	31000	5.4 J	6400	1200	0.072 J	<1 UJ	32 J
SS-F23SF-2SW	01/22/04	10 J	52	30000	5.6 J	7500	290	0.055 J	<1 UJ	36 J
SS-F23SF-3SW	01/22/04	21 J	53	33000	5.3 J	7500	640	0.093 J	<1 UJ	40 J
SS-F23SF-509	01/22/04	18 J	63	32000	13 J	6500	1600	0.11 J	<1 UJ	38 J
SS-F23SF-012	01/30/04	15 J	56	NA	12 J	NA	NA	<0.063	<1.3 UJ	43 J
SS-F23SF-013	01/30/04	12 J	48	NA	17 J	NA	NA	0.1	<1.1 UJ	35 J
SS-F23SF-014	01/30/04	14 J	56	NA	18 J	NA	NA	0.063	<1.2 UJ	45 J

Flare Sites 2 and 3 Stockpile Footprint Samples
Metals Analytical Results
(concentrations expressed in mg/kg)

Sample ID	Date Sampled	Phosphorus	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
SS-F23SF-002	01/22/04	270	1400	<2 UJ	<1 UJ	390 UJ	1.3 J	48 J	68 J
SS-F23SF-003	01/22/04	257	1300	<2 UJ	<1 UJ	360 UJ	1 J	59 J	52 J
SS-F23SF-004	01/22/04	269	1600	<2 UJ	<1 UJ	410 UJ	1.2 J	58 J	58 J
SS-F23SF-005	01/22/04	253	1400	<2 UJ	<1 UJ	390 UJ	1.1 J	57 J	60 J
SS-F23SF-006	01/22/04	286	1300	<2 UJ	<1 UJ	480 UJ	<1 UJ	62 J	76 J
SS-F23SF-007	01/22/04	261	1300	<2 UJ	<1 UJ	410 UJ	1.3 J	50 J	67 J
SS-F23SF-008	01/22/04	265	1400	<2 UJ	<1 UJ	420 UJ	1.1 J	52 J	69 J
SS-F23SF-009	01/22/04	311	1300	<2 UJ	<1 UJ	430 UJ	1.2 J	66 J	73 J
SS-F23SF-010	01/22/04	229	1300	<2 UJ	<1 UJ	410 UJ	1.3 J	59 J	75 J
SS-F23SF-011	01/22/04	207	980	<2 UJ	<1 UJ	330 UJ	<1 UJ	50 J	70 J
SS-F23SF-1SW	01/22/04	254	1200	<2 UJ	<1 UJ	320 UJ	<1 UJ	56 J	62 J
SS-F23SF-2SW	01/22/04	307	1100	<2 UJ	<1 UJ	310 UJ	<1 UJ	43 J	73 J
SS-F23SF-3SW	01/22/04	145	1200	<2 UJ	<1 UJ	330 UJ	<1 UJ	43 J	74 J
SS-F23SF-509	01/22/04	302	1300	<2 UJ	<1 UJ	440 UJ	1.3 J	57 J	94 J
SS-F23SF-012	01/30/04	369	NA	<2.5 UJ	<1.3 UJ	NA	<1.3 UJ	57 J	65 J
SS-F23SF-013	01/30/04	361	NA	<2.2 UJ	<1.1 UJ	NA	<1.1 UJ	56 J	63 J
SS-F23SF-014	01/30/04	299	NA	<2.3 UJ	<1.2 UJ	NA	<1.2 UJ	59 J	64 J

Notes:
Metals analyzed using EPA Method 6010B/7471A.

J	The numerical value is the approximate concentration of the analyte in the sample, due to a QC exceedance.
UJ	The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limits of quantitation necessary to accurately and precisely measure the analyte in the sample.
NA	Not analyzed
R	Result rejected based on QC evaluations.

Table B-3b
Flare Sites 2 and 3 Stockpile Footprint Samples
Perchlorate Analytical Results

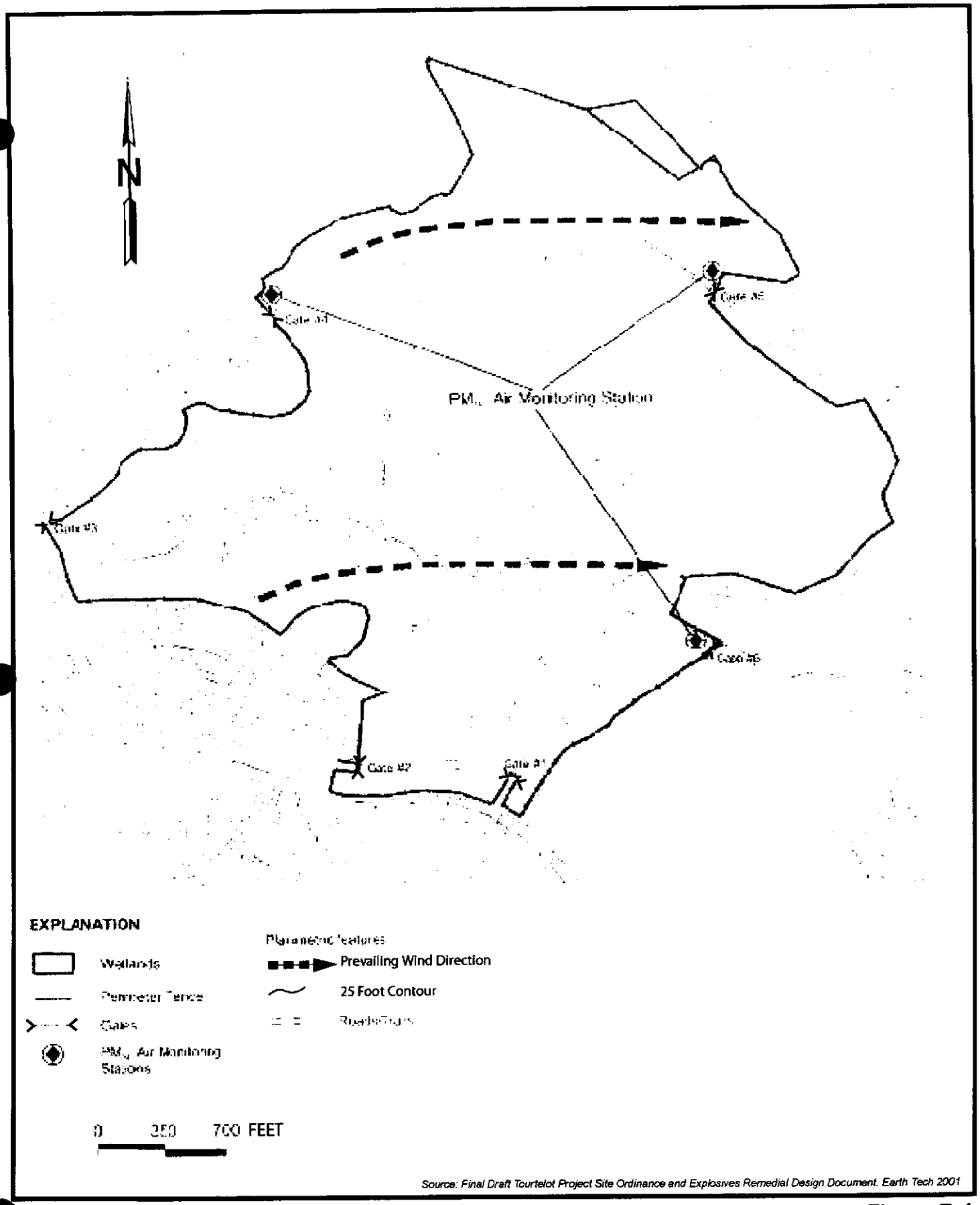
(concentrations expressed in mg/kg)

Sample ID	DateSampled	Perchlorate
SS-F23SF-004	01/22/04	<0.065
SS-F23SF-010	01/22/04	<0.061

Table B-3c
Flare Sites 2 and 3 Stockpile Footprint Samples
Dioxin and Furan Analytical Results
(concentrations expressed in picograms per gram)

Sample ID	DateSampled	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	OCDD	OCDF
SS-F23SF-004	01/22/04	<2.4	<1.5	<1.8	<2.2	<2.2	<2.4	<2.1	<2.2	<2.6	<4.1	<3.1	<2.4	<3.1	<0.74	<0.73	13	<4
SS-F23SF-010	01/22/04	<1.1	<0.77	<0.9	<1.1	<0.83	<1.1	<0.82	<1	<1	<1.6	<1.1	<0.93	<1.1	<0.78	<0.32	7.6	<1.5

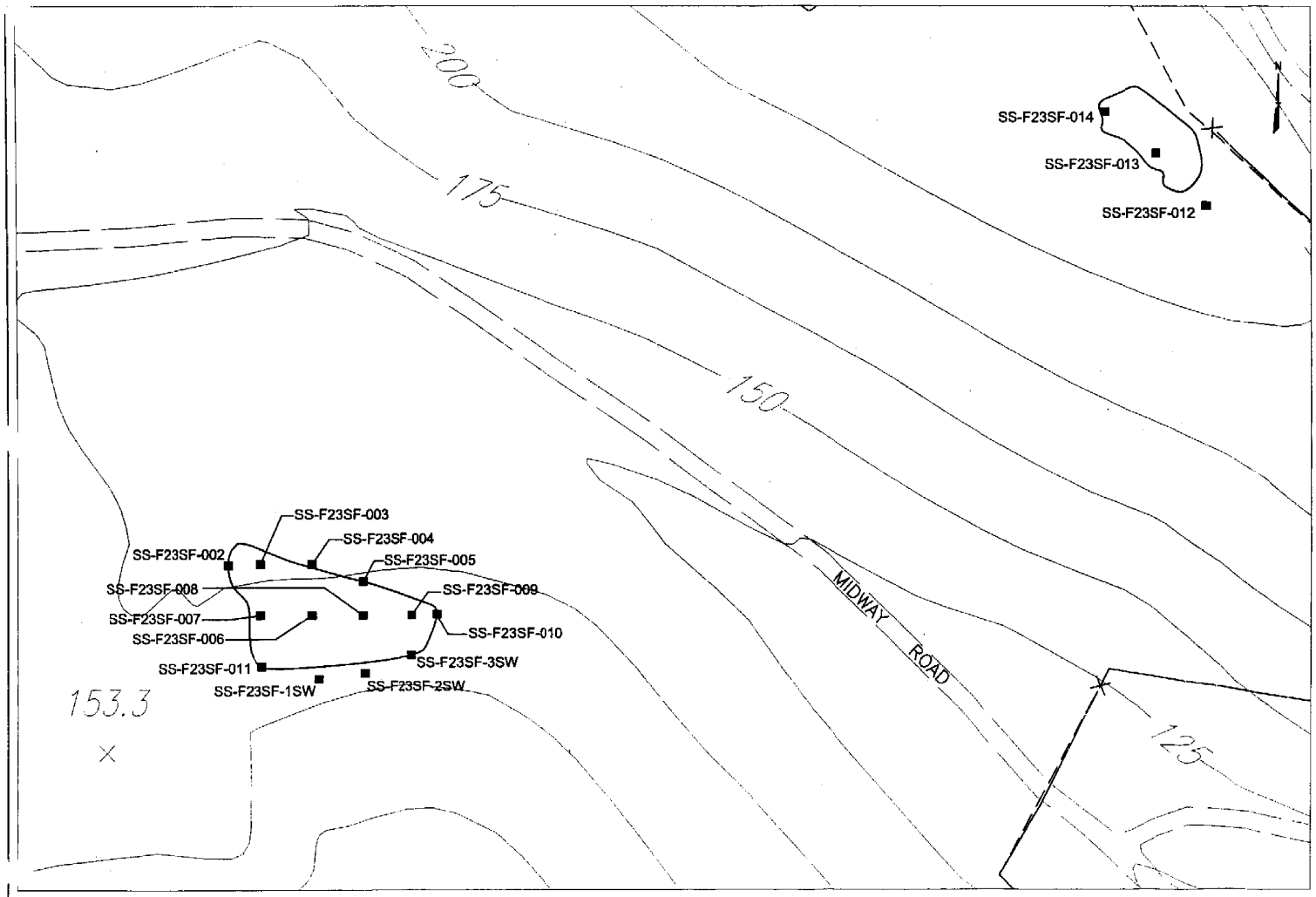
FIGURES



Source: Final Draft Tourtelot Project Site Ordinance and Explosives Remedial Design Document. Earth Tech 2001

northgate environmental management, inc.

Figure B-1
PM10 Air Monitoring Stations
Tourtelot Cleanup Project, Benicia, California
March 2004



EXPLANATION

- Project Boundary
- Confirmation Sample Location
- Footprints of Former Excavation - Stockpile
- 200 Topographic Contour

Date of topography July 1998 (Cartwright Aerial)

0' 25' 50'
SCALE 1" : 50'

Figure B-2
Confirmation Sample Locations
North Valley

Tourtelot Cleanup Project
Benicia, California
March 2004
Project No. 1056.03

northgate environmental management, inc.

ATTACHMENTS

Attachment B-1

Tourtelot Project
#1056/7001
By: JWO

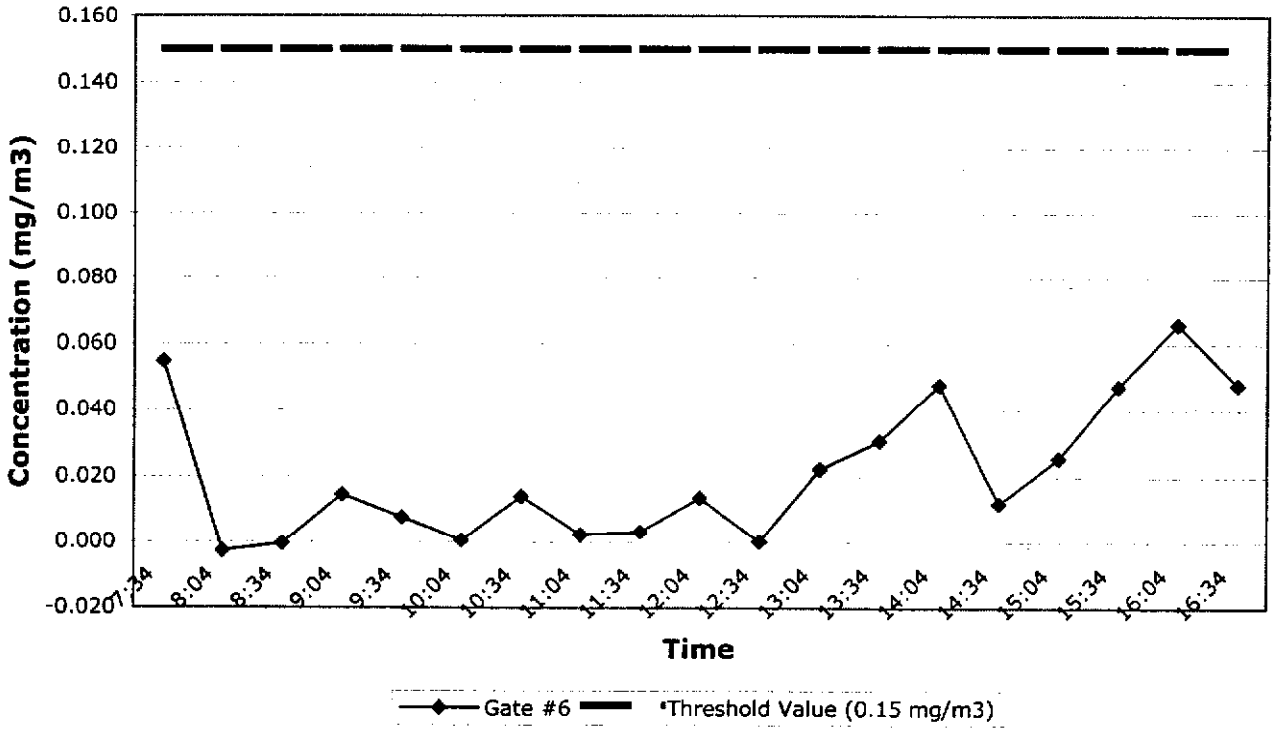
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 6, 2003

Activities: Scrapers running
South Valley Flare and Mercury site excavations
Drilling in TNT area
Sifter in operation

Wind: 10 - 20 mph from W/WNW

Downwind - Upwind PM10 Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.011
Gate #6	0.033

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

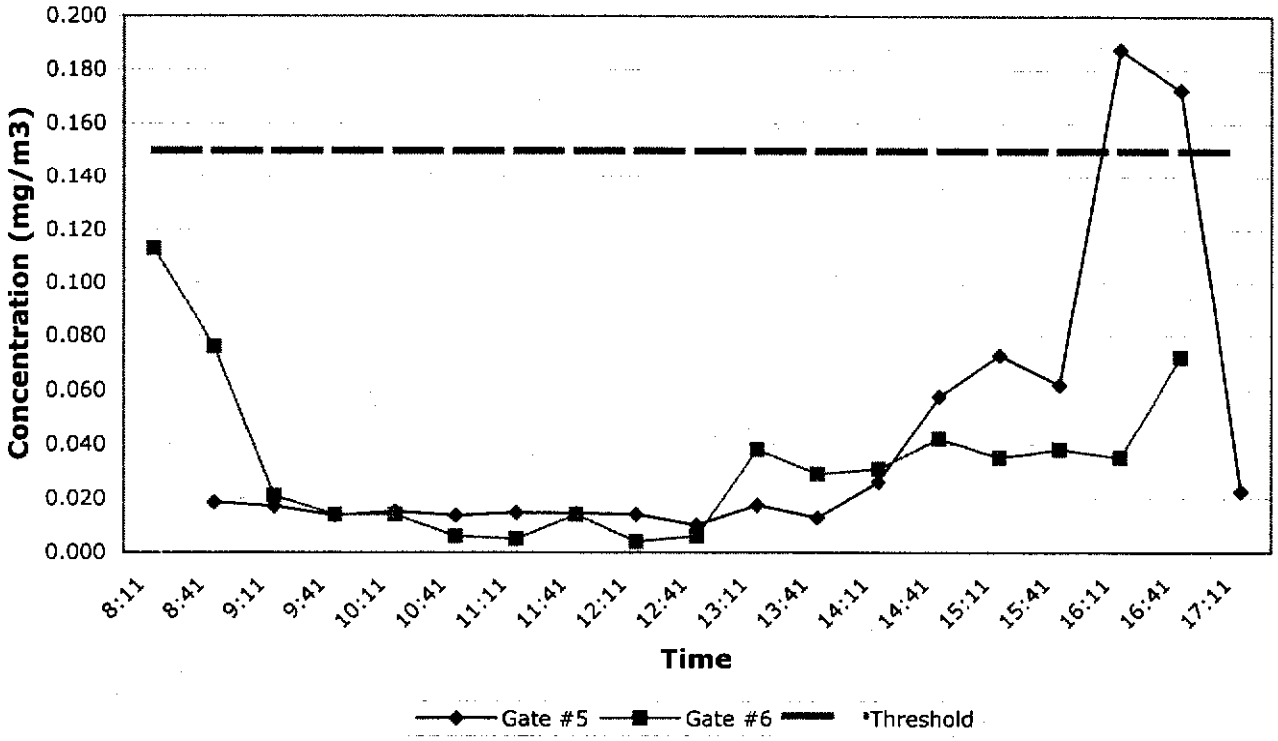
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 7, 2003

Activities: Scrapers running
Sifter running
Excavations in South Valley
Scrapers in North Valley by Gate #5

Wind:

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.042
Gate #6	0.033

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
*Upwind monitor non-functional.

Tourtelot Project
#1056/7001
By: JWO

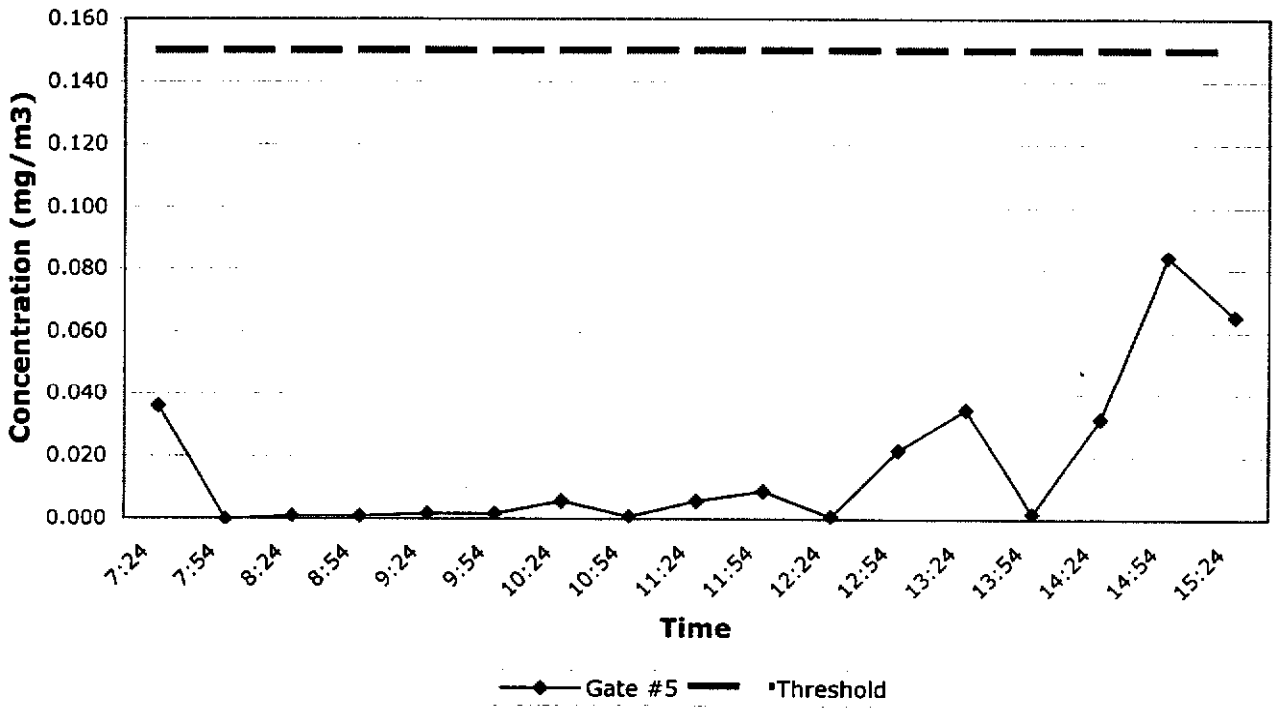
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 8, 2003

Activities: South Valley excavations
Sifter in Operation
Drilling in TNT Strip area
Scrapers on Land Bridge

Wind: 10 - 20 mph from W/SW

PM10 Dust Concentrations



Daily Average Concentrations:
Gate #5: 0.018

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

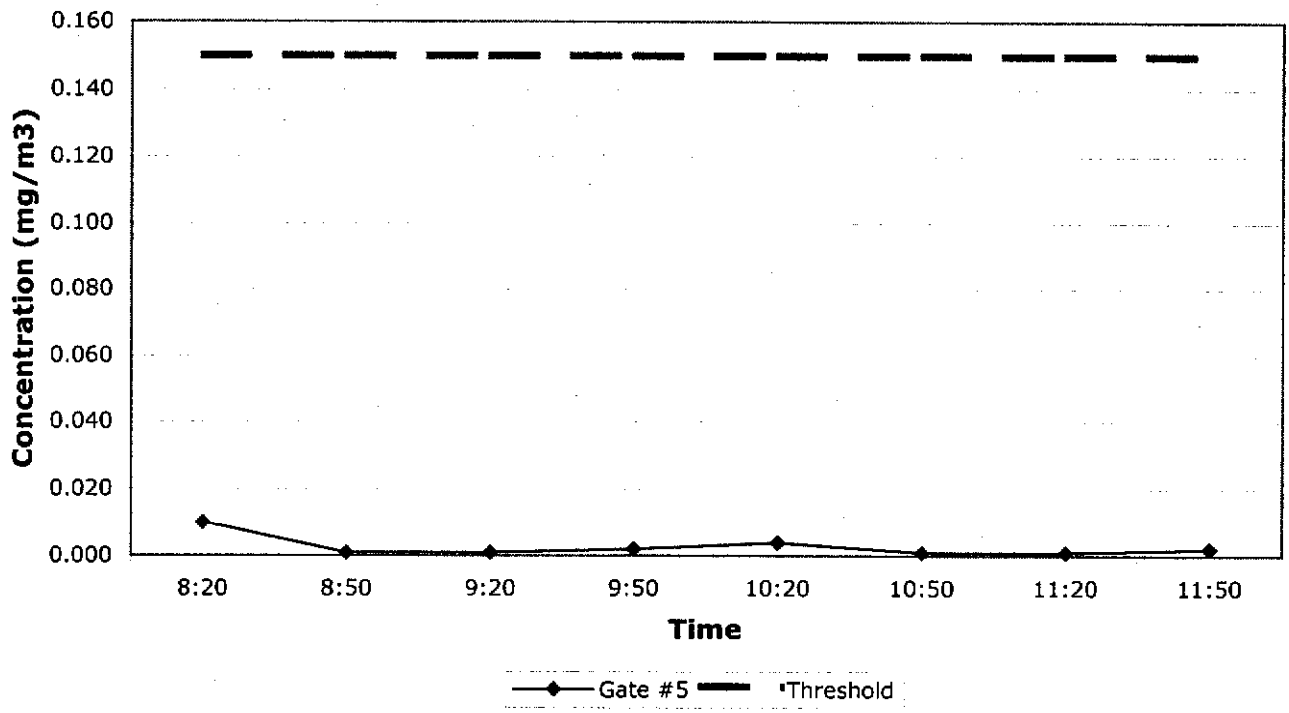
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 9, 2003

Activities: South Valley excavations (only until 10AM- Mechanical Problem)
Scrapers on Land Bridge

Wind:

PM10 Dust Concentrations



Daily Average Concentrations:
Gate #5: 0.003

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

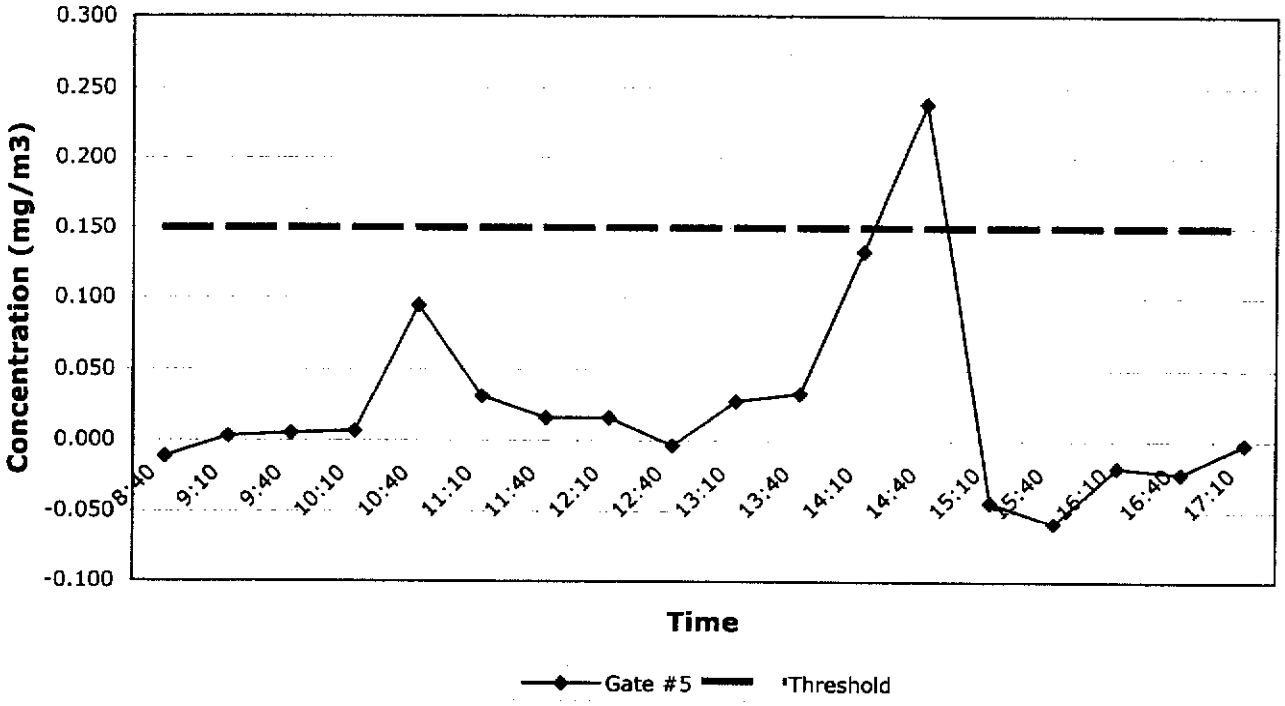
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 11, 2003

Activities: South Valley Excavations
Scrapers on Land Bridge
Sifter in Operation
Equipment operating near Gate #5, North Valley

Wind: 10 - 20 mph from West

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4	0.022
Gate #5	0.047

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

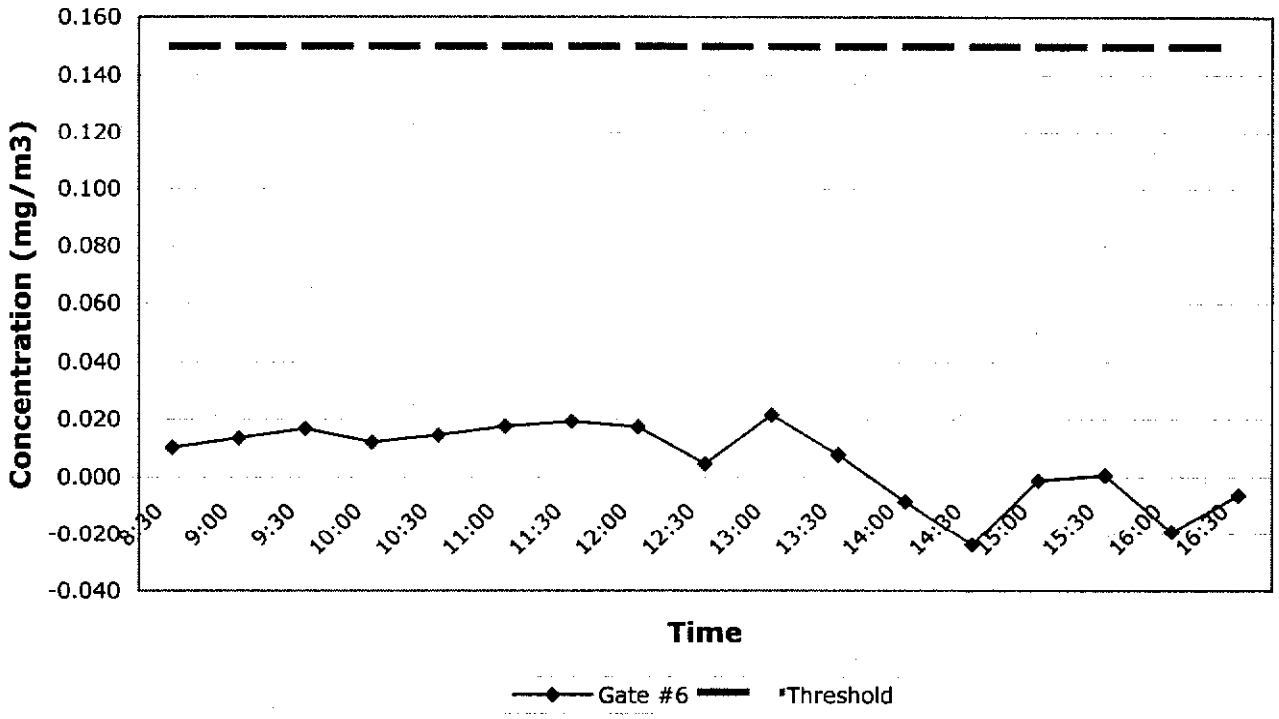
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 12, 2003

Activities: South Valley excavations
Scrapers on Land Bridge
Trench excavation by South Fork
Sifter in operation

Wind:

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.016
Gate #6	0.020

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

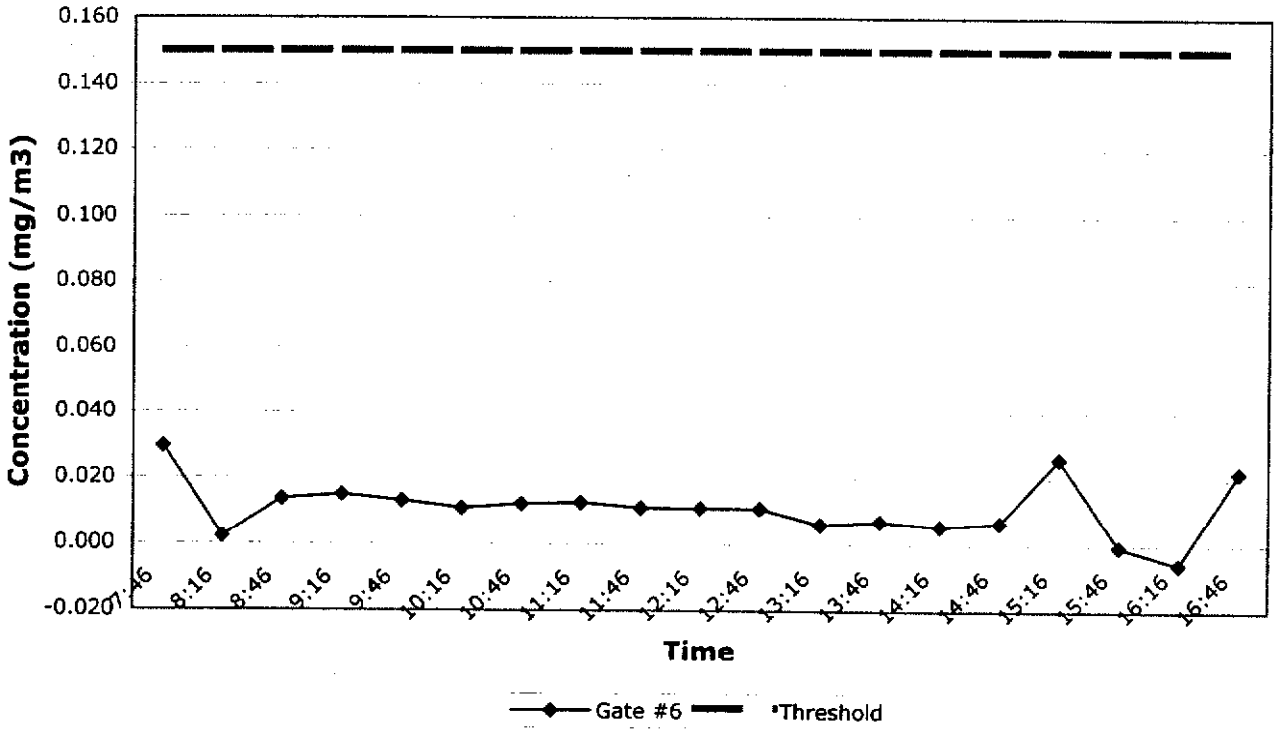
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 13, 2003

Activities: South Valley excavations
Sifter in operation
Scrapers on Land Bridge
Trench excavation by South Fork

Wind:

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.007
Gate #6	0.017

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

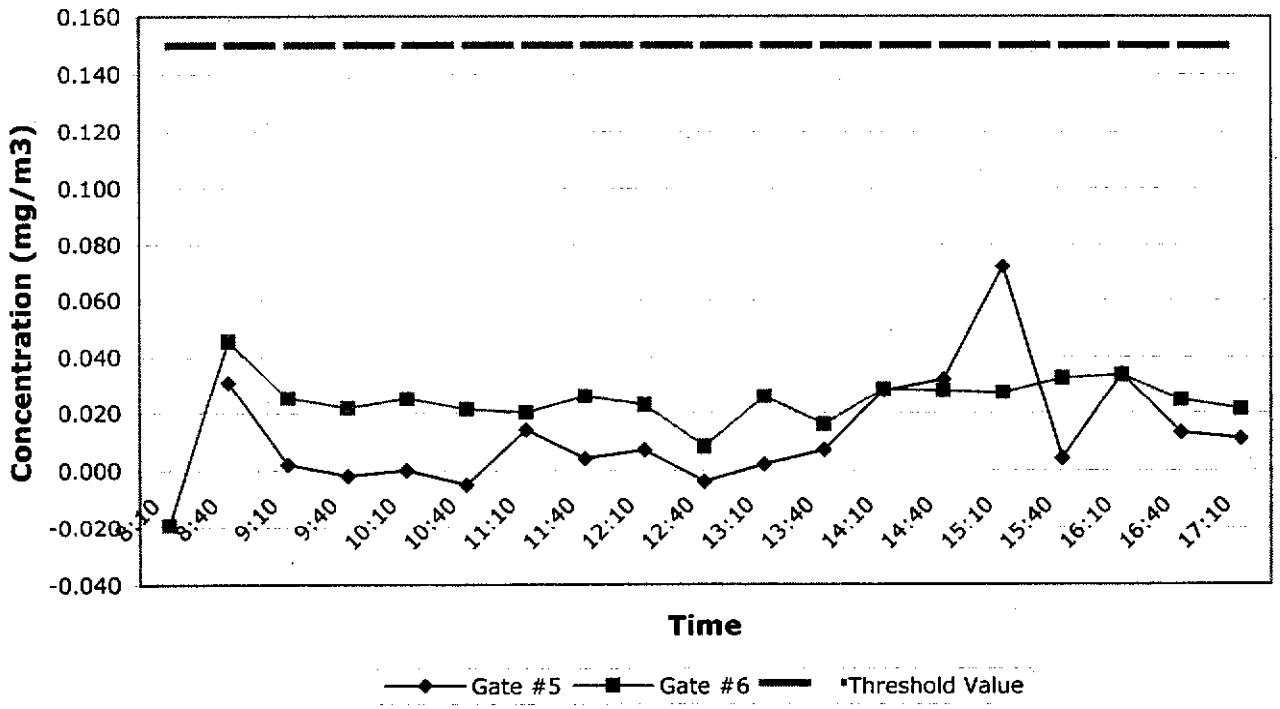
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 14, 2003

Activities: Sifter in operation
Excavations in South Valley
Scrapers on land bridge

Wind:

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.007
Gate #5	0.019
Gate #6	0.031

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

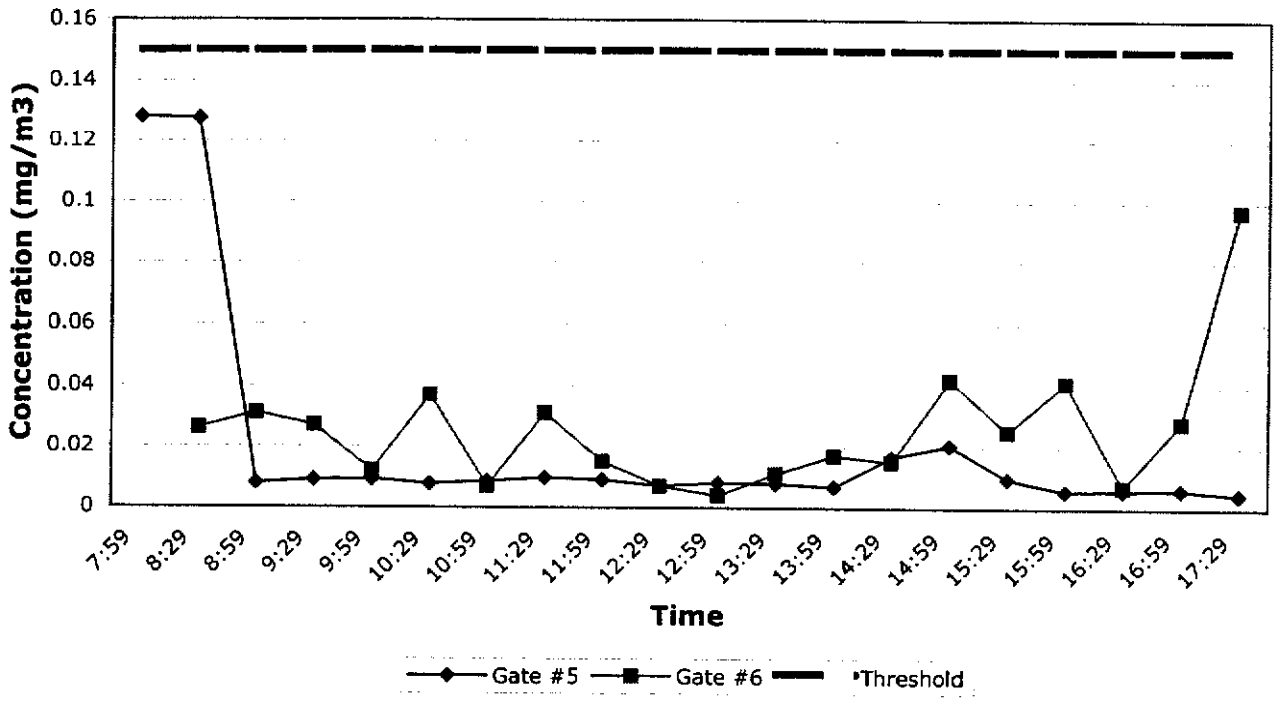
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 15, 2003

Activities: Excavating Demo Site #3
Backfilling lense excavation near South Fork
Scrapers on land bridge
Sifter in operation

Wind:

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.021
Gate #6	0.025

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
*Monitor at Gate #4 (upwind location) had a corrupted data file- filter sample only for today.

Tourtelot Project
#1056/7001
By: JWO

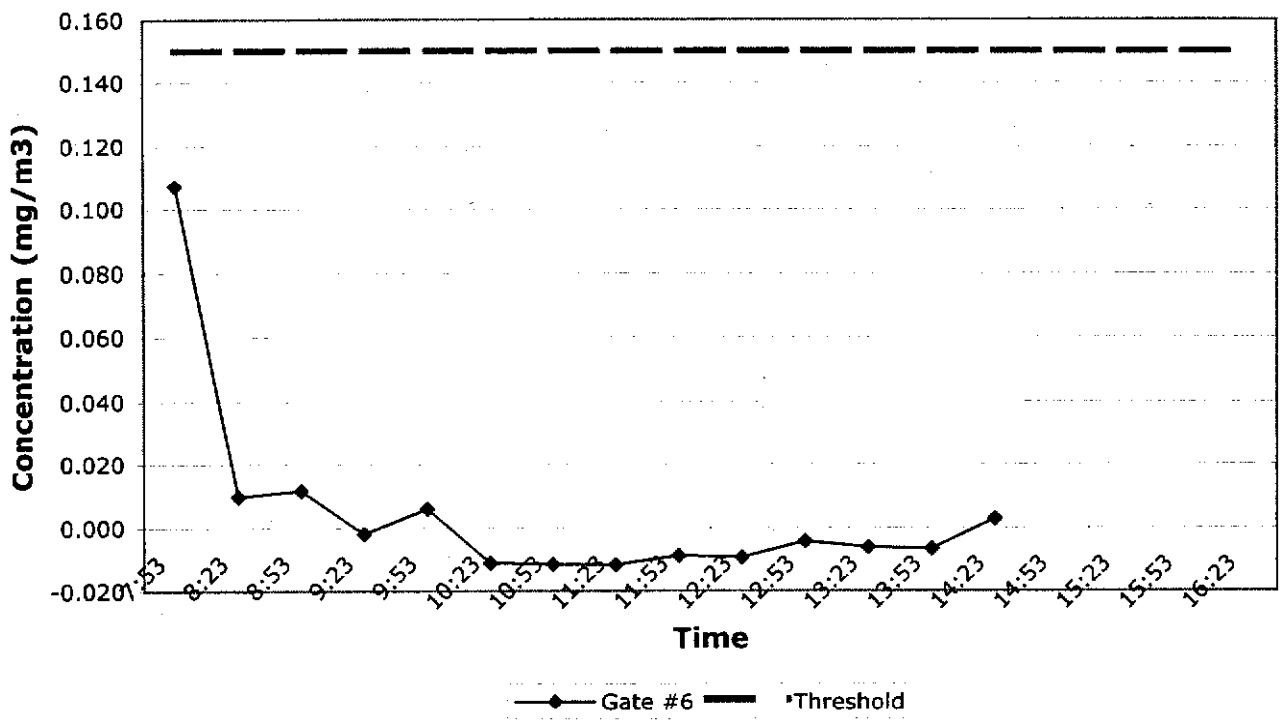
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 16, 2003

Activities: Excavations in South Valley
Scrapers on land bridge

Wind:

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.014
Gate #6	0.020

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
*No datalog for Gate #5 Monitor because of corrupted file.
*Gate #6 datalog ends at 14:23; filter sample is for entire day.

Tourtelot Project
#1056/7001
By: JWO

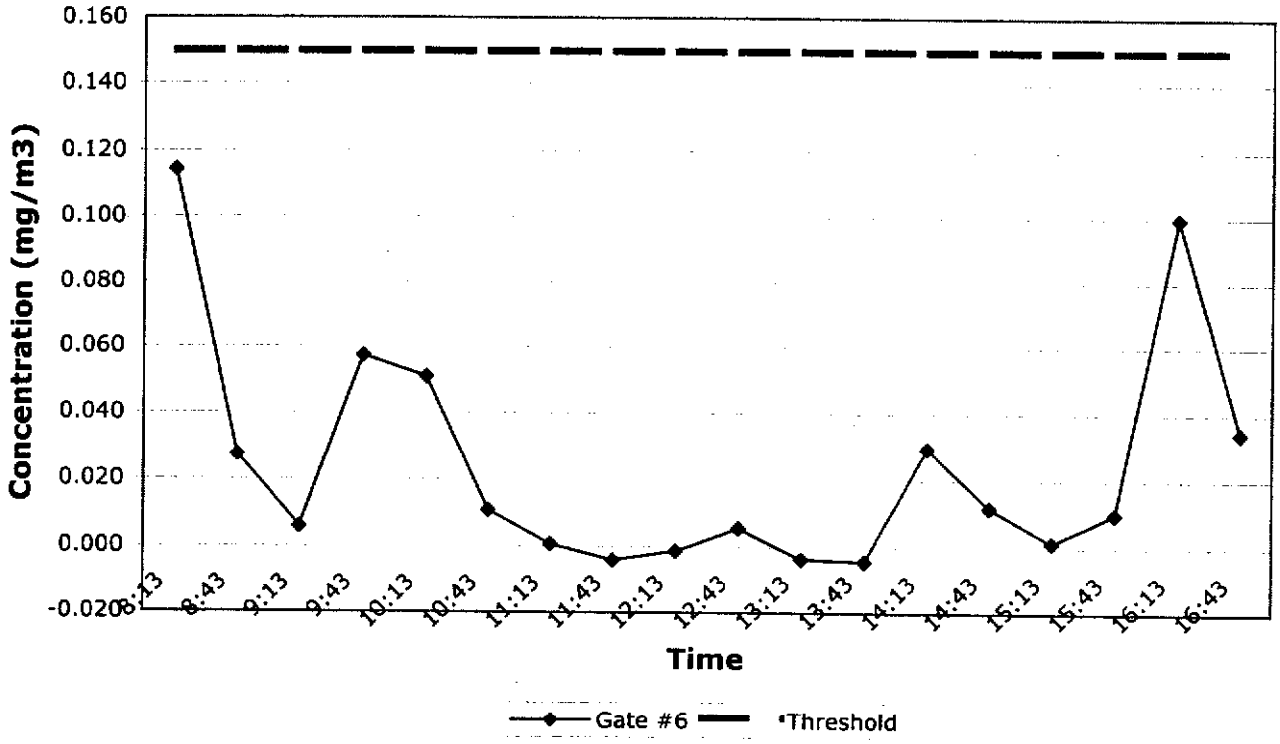
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 18, 2003

Activities: Sifter in operation
Excavations in South Valley
Scrapers on land bridge

Wind:

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.006
Gate #6	0.031

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
*No datalog for Gate #5 Monitor due to corrupted file.

Tourtelot Project
#1056/7001
By: JWO

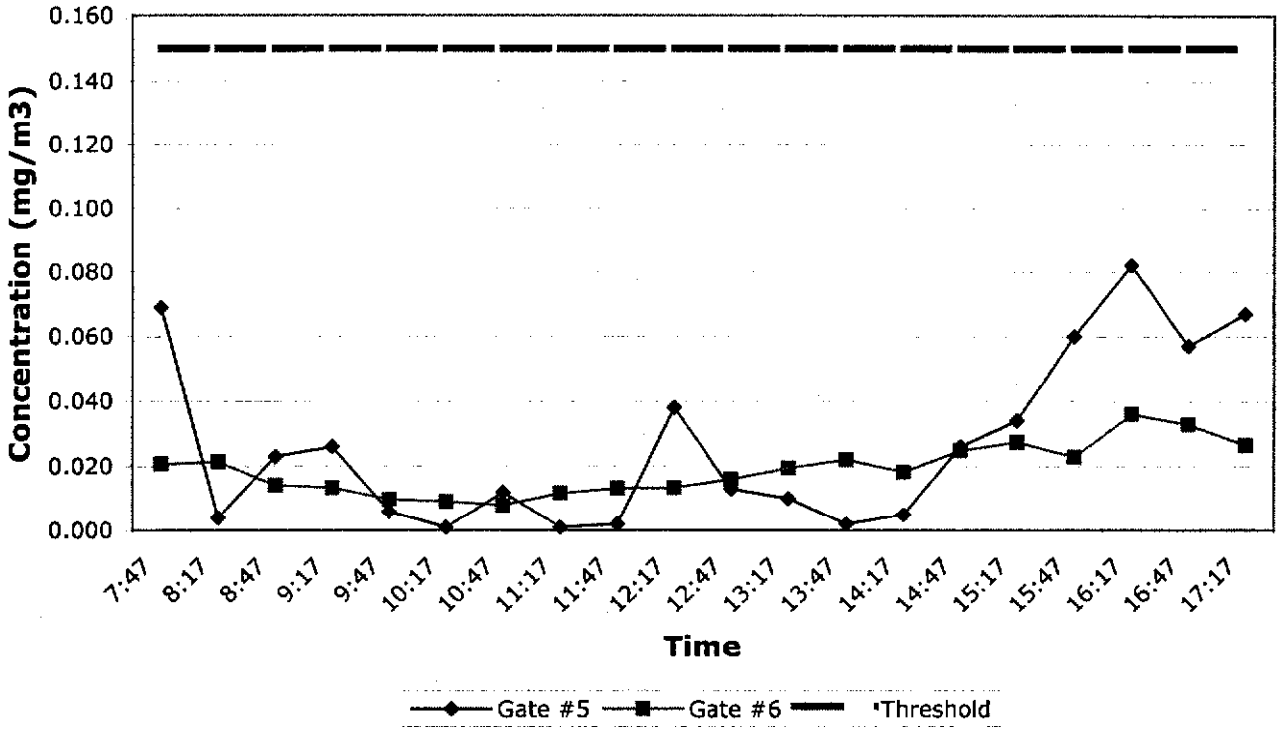
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 19, 2003

Activities: Sifter in operation
Excavating in South Valley
Lens excavation/backfill
Scrapers on land bridge
Dig Team working by Gate #5

Wind:

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.027
Gate #6	0.019

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

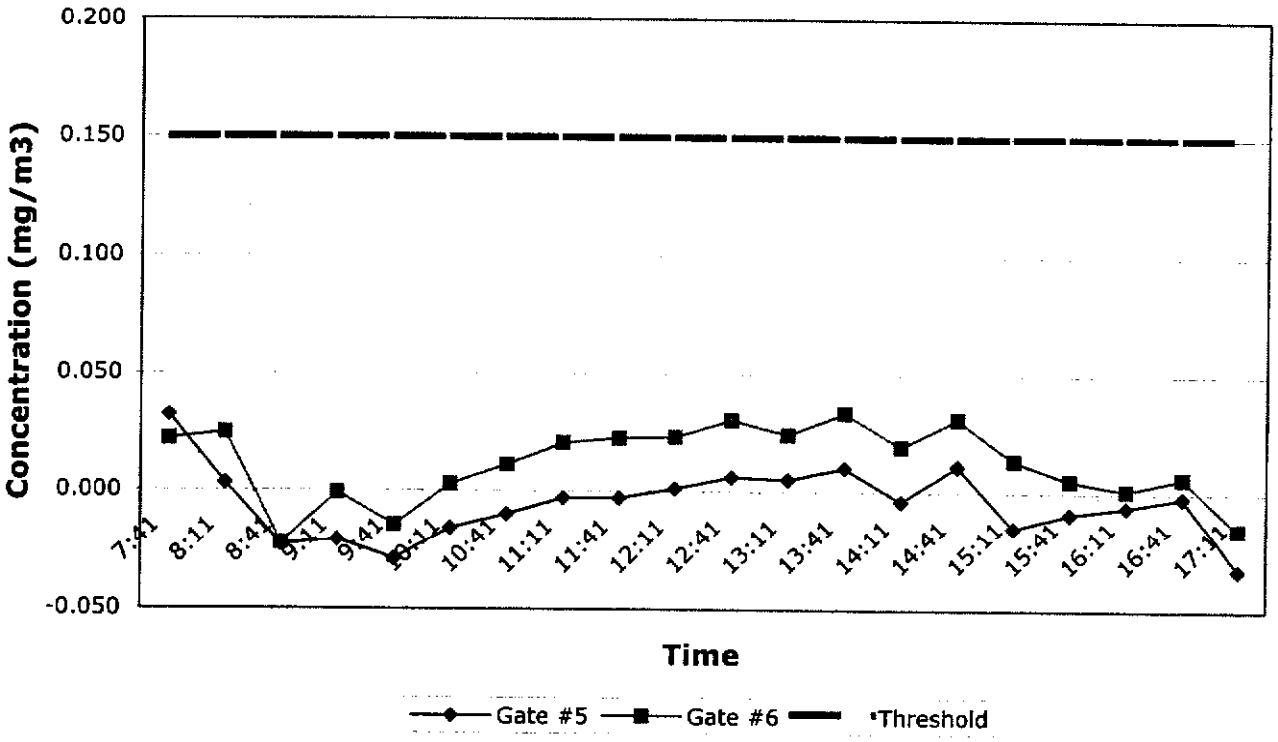
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 20, 2003

Activities: Sifter in operation
Lens excavation/backfill
Excavation in South Valley
Dig team working by Gate #5

Wind:

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.016
Gate #5	0.009
Gate #6	0.026

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

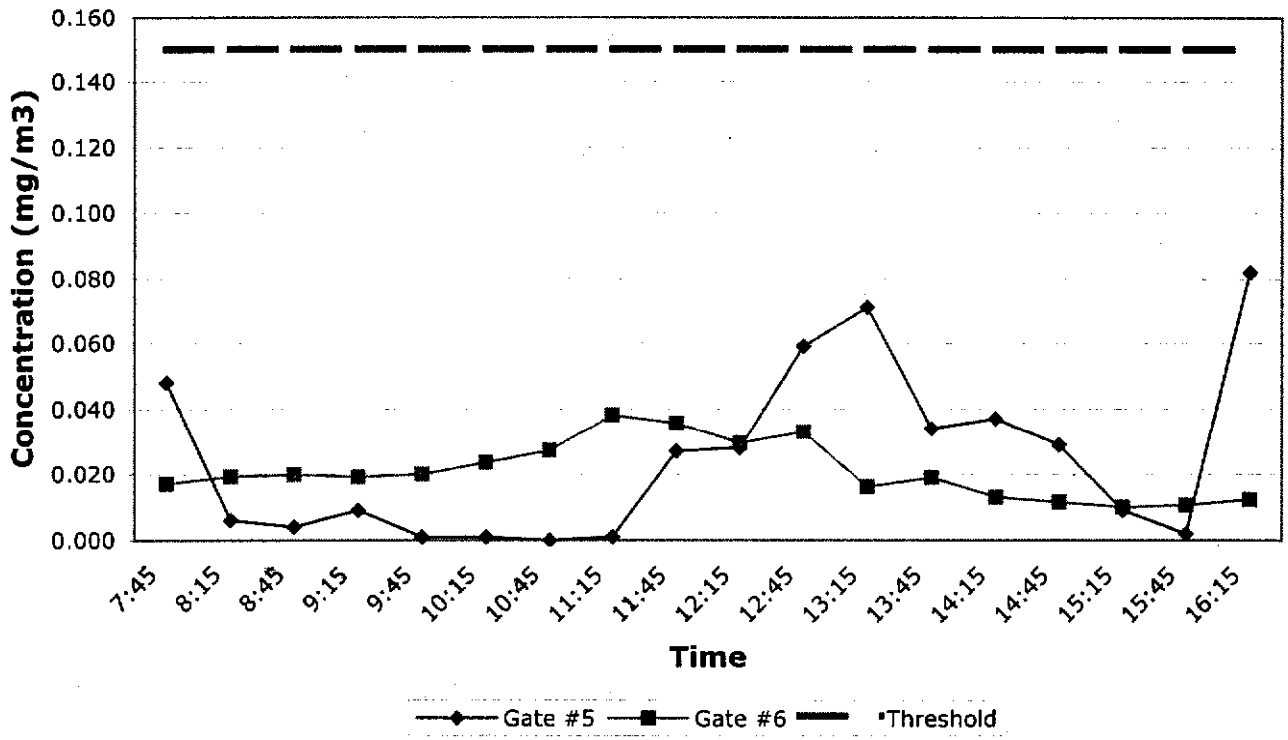
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 21, 2003

Activities: Sifter in operation
Excavation in South Valley
Lens excavation/backfill

Wind:

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.025
Gate #6	0.021

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

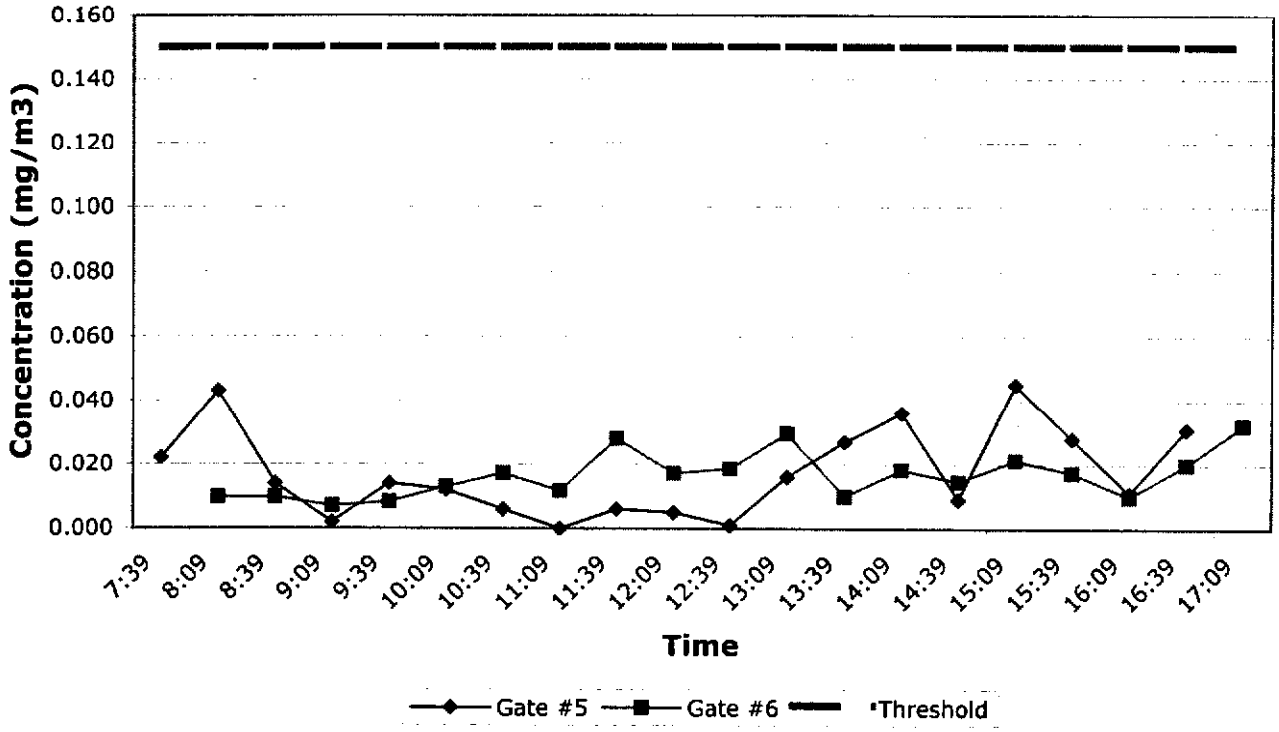
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 22, 2003

Activities: Sifter in operation
Excavation in South Valley
Scrapers on hillside in North Valley
Lens excavation/backfill

Wind:

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.017
Gate #6	0.016

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

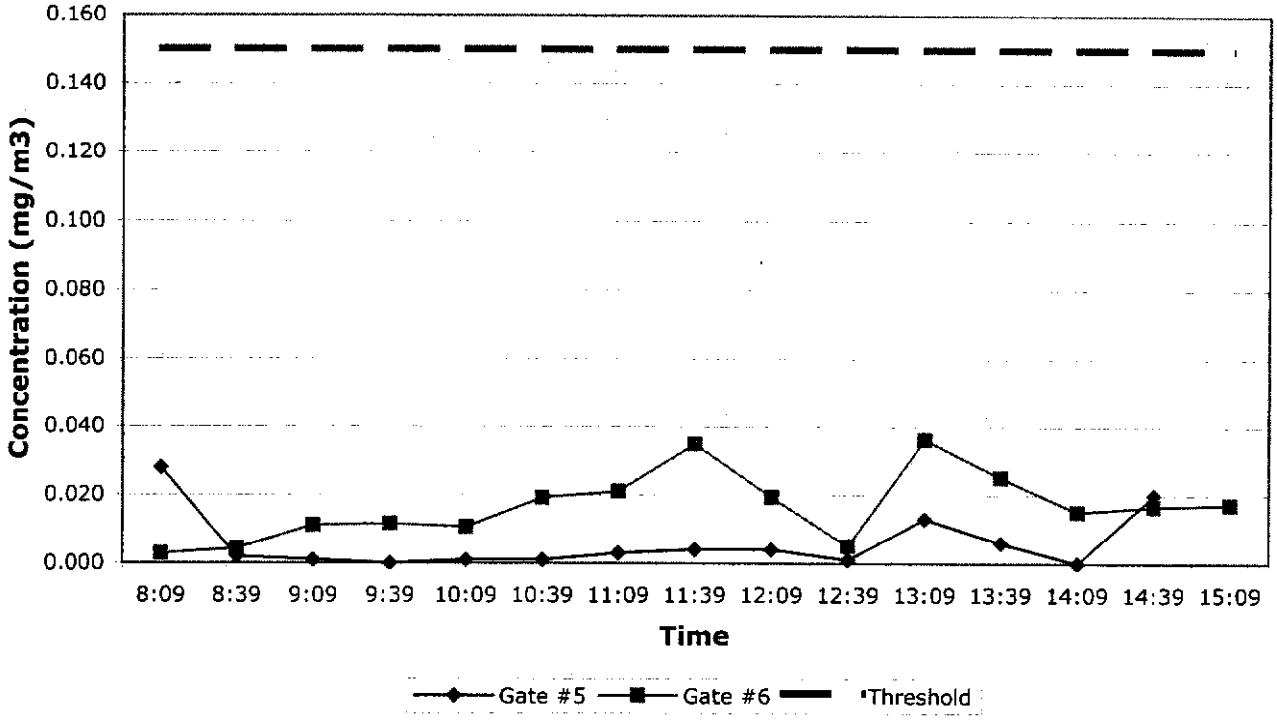
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 23, 2003

Activities: Hauling South Face of South Valley soils
Scrapers in North Valley
Lens excavation, backfill in Unit D-1

Wind: 0 - 10 mph from West

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.006
Gate #6	0.017

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

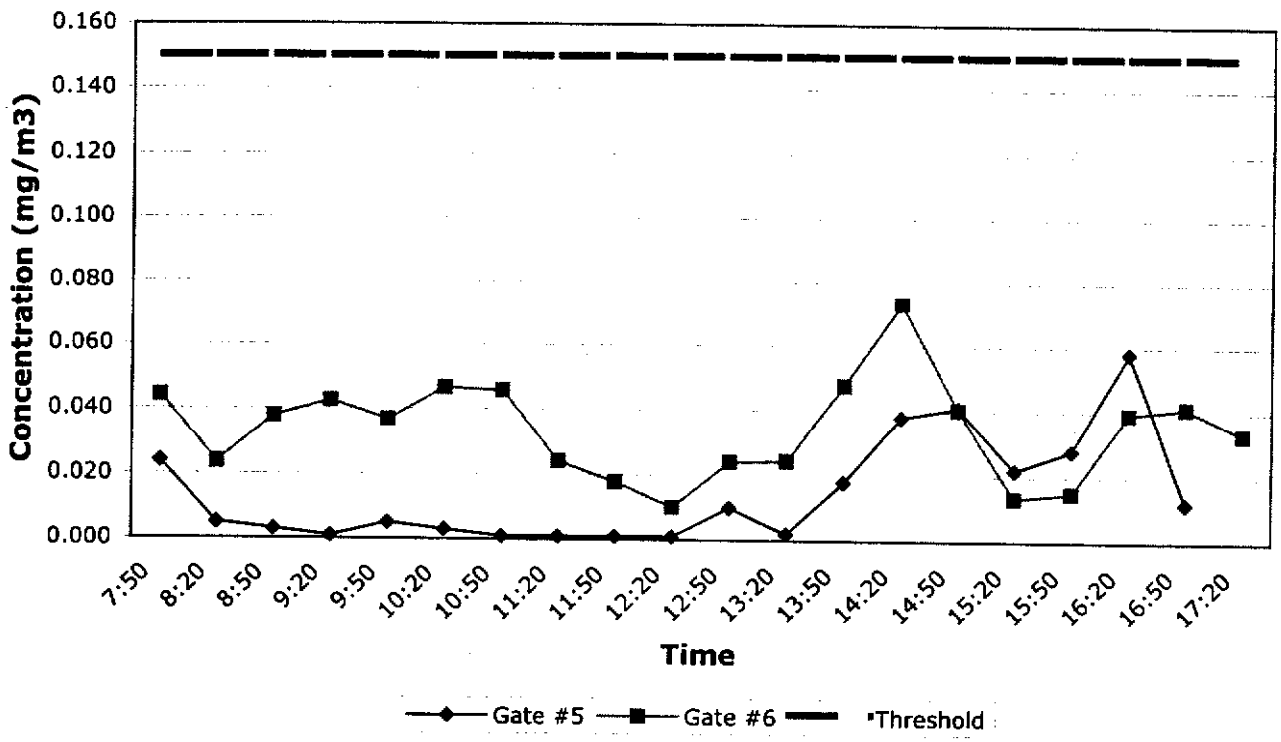
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 25, 2003

Activities: Hauling Soils from South Valley
Scrapers in North Valley

Wind: 0-10 mph from West

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.014
Gate #6	0.034

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

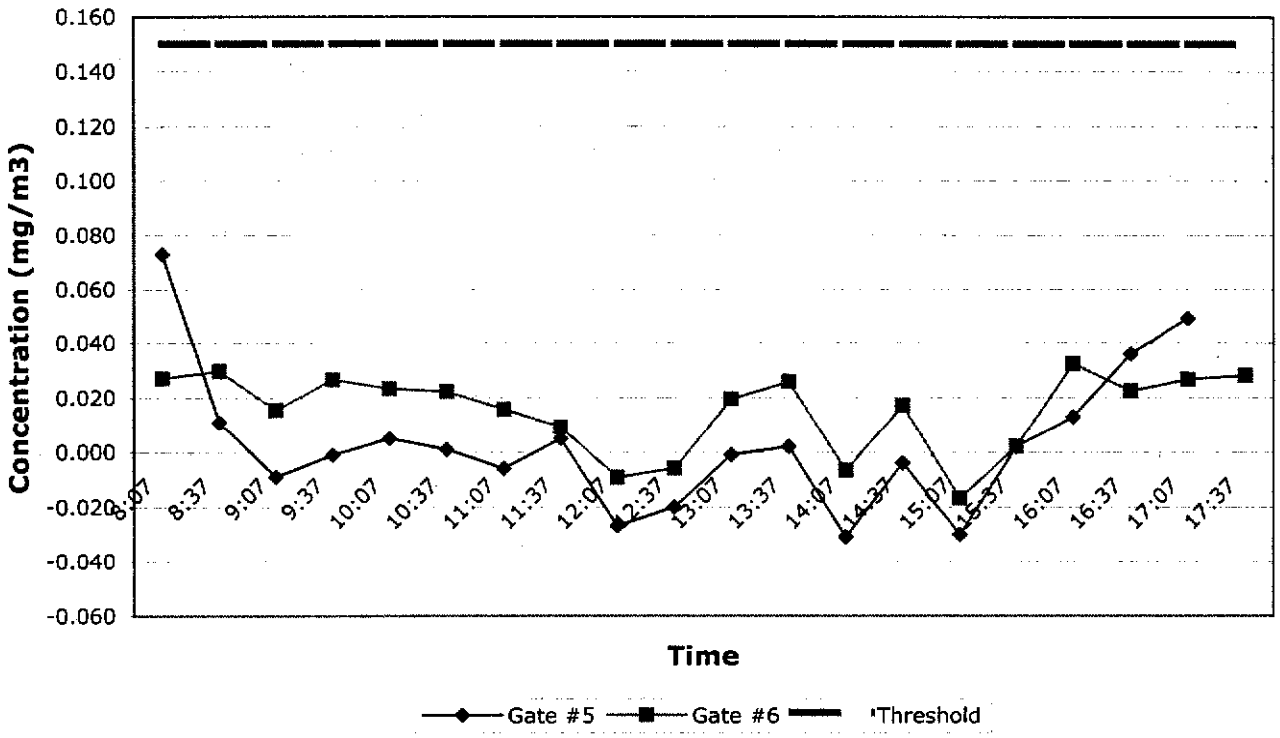
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 26, 2003

Activities: Fill/Compaction in North Valley
Excavations in South Valley
Sifter in operation

Wind: 7-17 mph from West

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.019
Gate #5	0.014
Gate #6	0.025

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

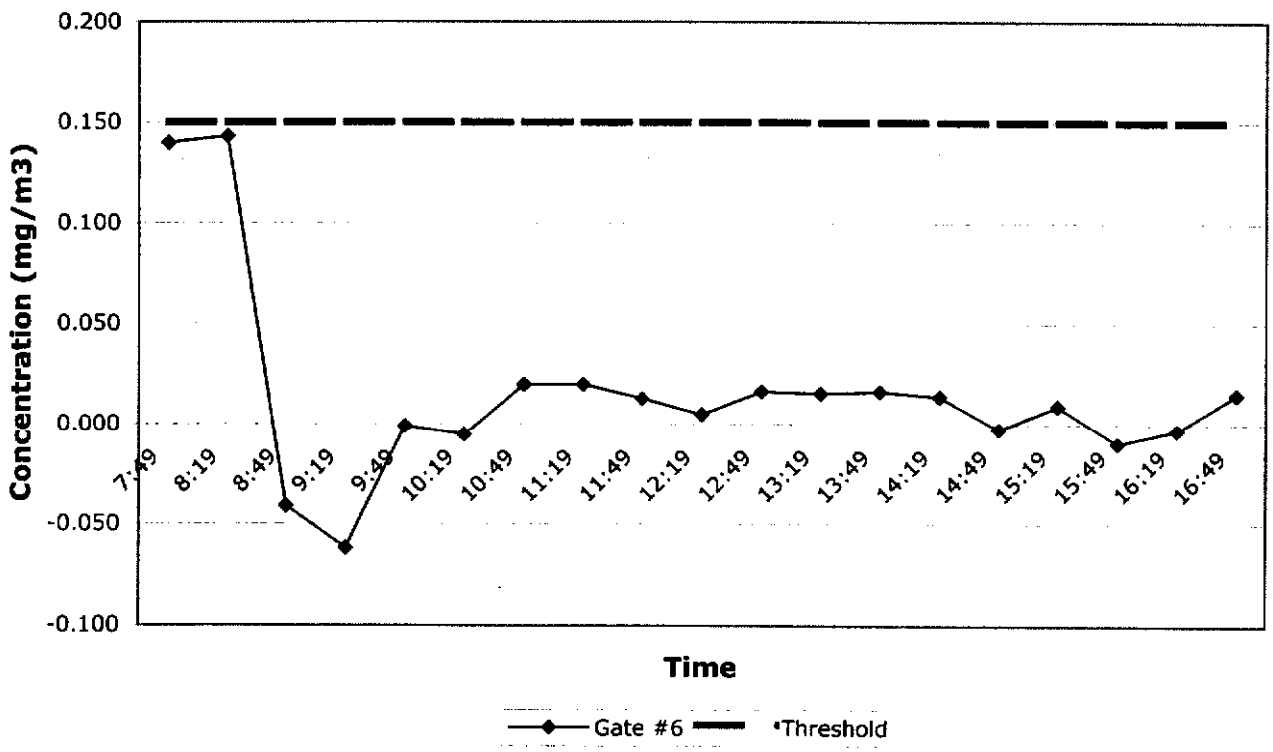
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 27, 2003

Activities: Fill/Compaction in North Valley
Scraping north face of South Valley
Sifter in operation

Wind: 5-15 mph from West

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.018
Gate #6	0.033

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

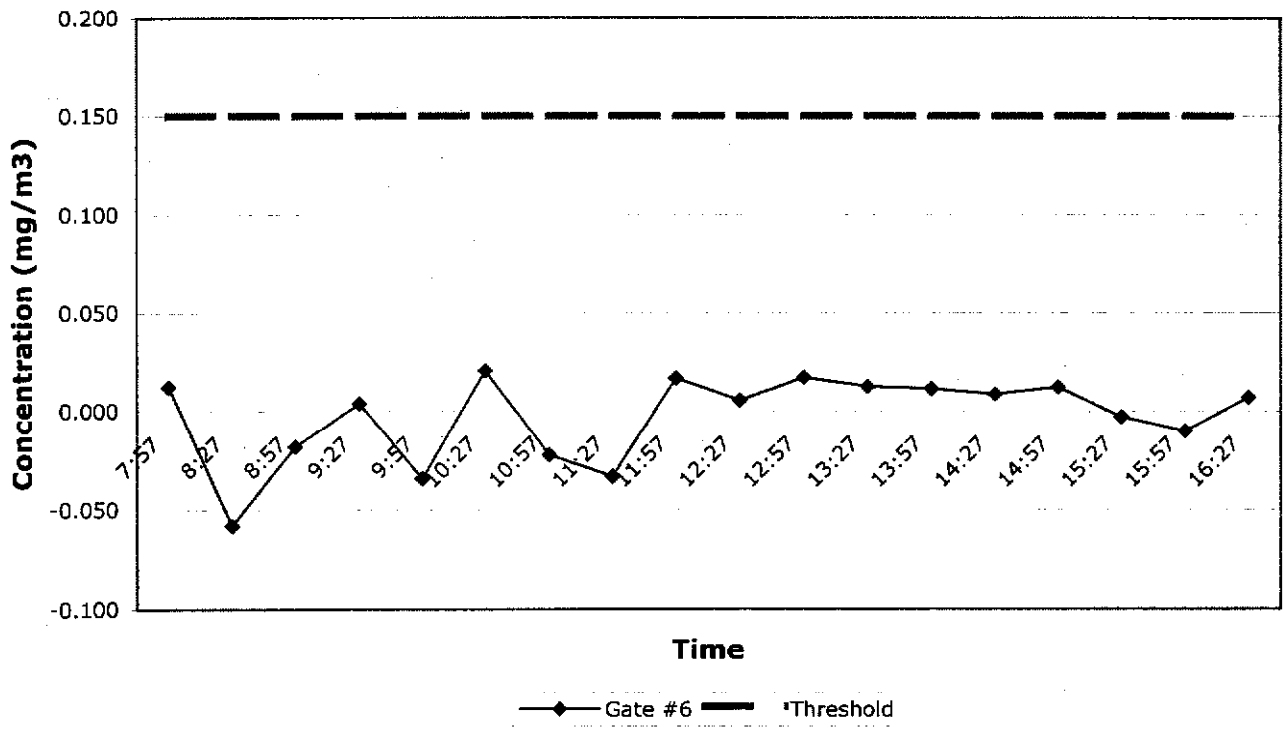
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 28, 2003

Activities: Fill/Compaction in North Valley
Scraping north face of South Valley
Sifter in operation

Wind: 5-10 mph from West

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.020
Gate #6	0.016

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

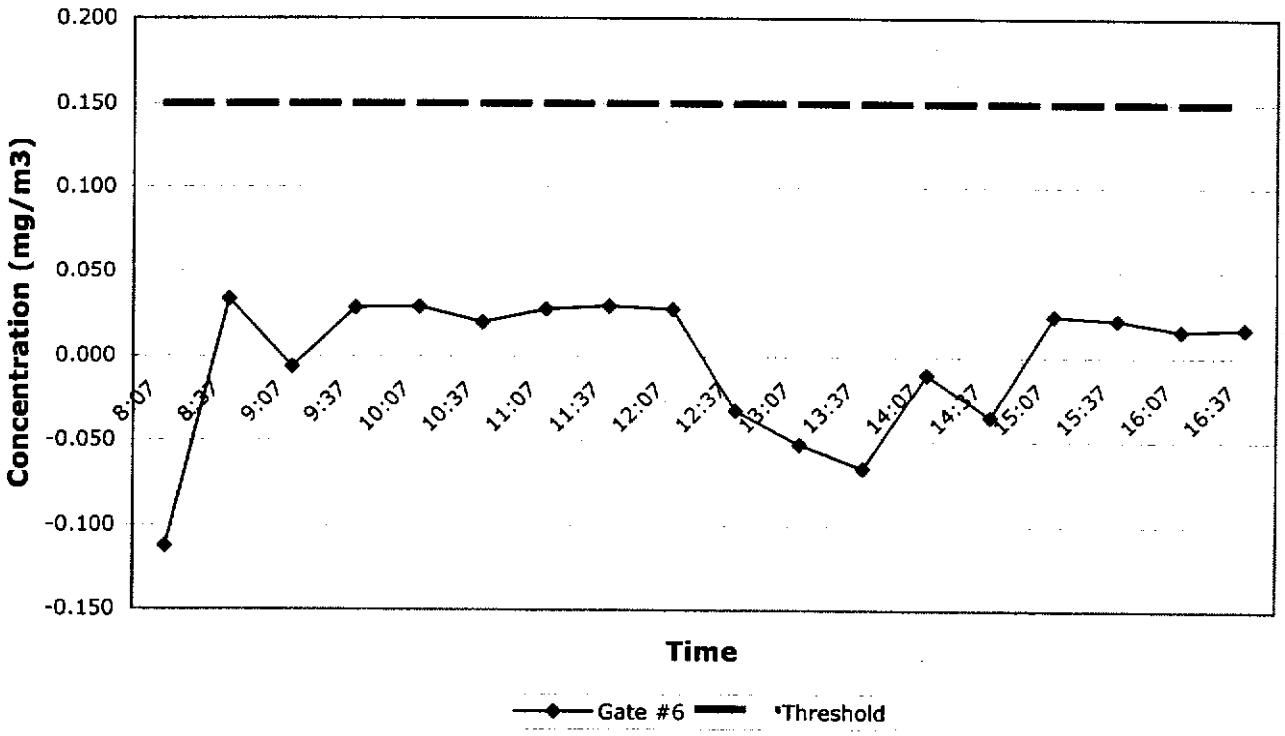
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 29, 2003

Activities: Fill/Compaction in North Valley
Scraping north face of South Valley
Sifter in operation

Wind: From the West at 5 to 7 mph.

Downwind - Upwind PM10 Dust Concentrations



Daily Average Concentrations:

Gate #4 (upwind)	0.035
Gate #6	0.032

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

Tourtelot Project
#1056/7001
By: JWO

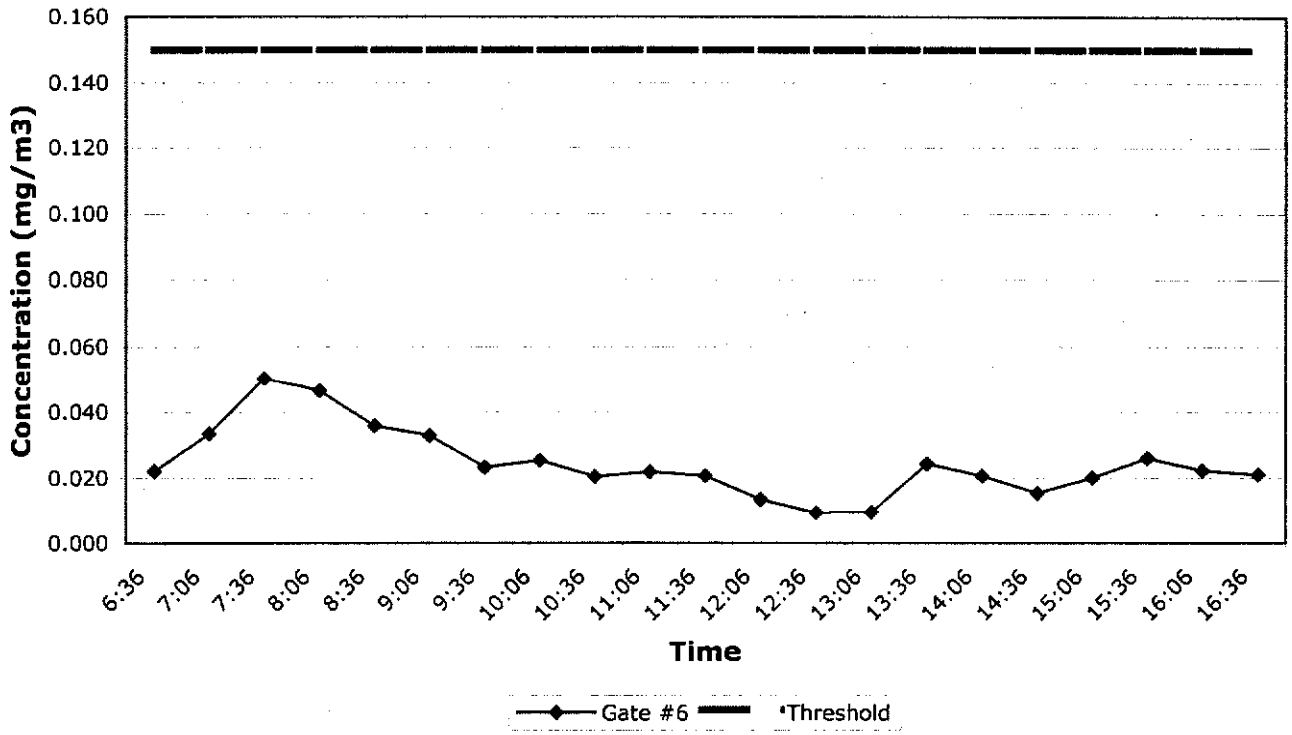
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 30, 2003

Activities: Fill/Compaction in North Valley
Loading and Hauling from Demo Pit 3 Halo
Sifter in operation

Wind: From the West at 6 mph.

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #6	0.024

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.

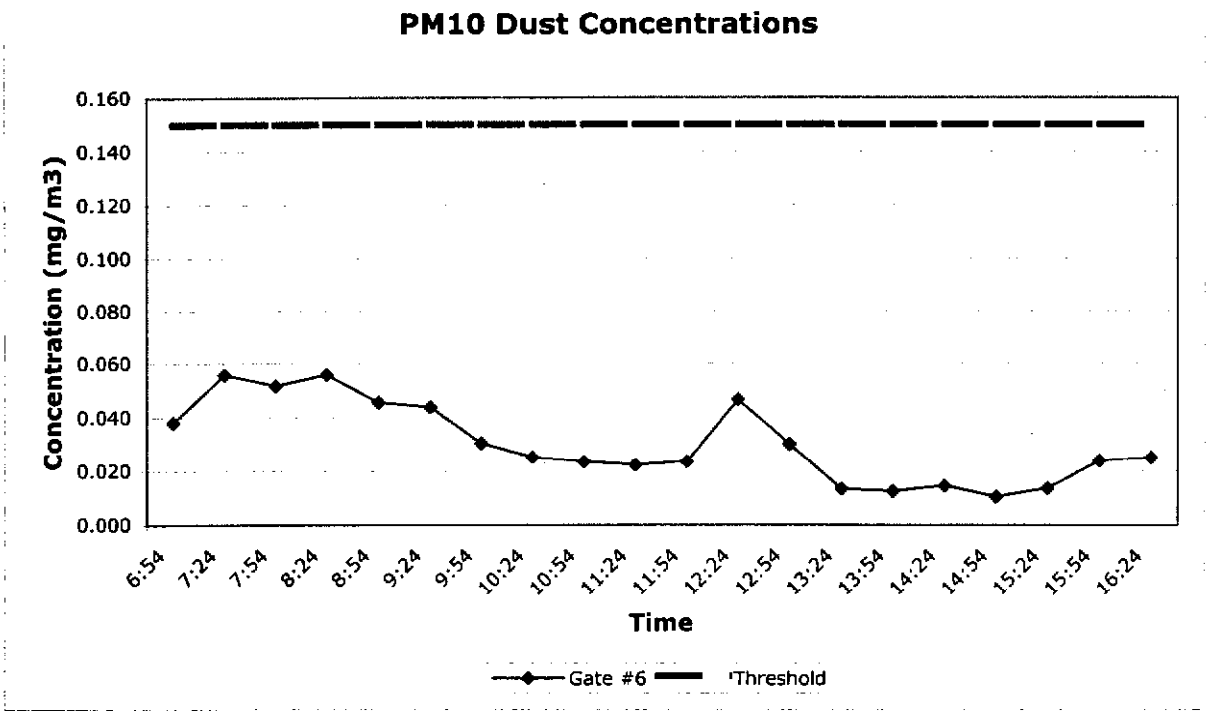
Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for August 31, 2003

Activities: Loading and Hauling from Demo Pit 3 Halo

Wind: From the West: 5 to 10 mph.



Daily Average Concentrations:

Gate #6	0.030

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
Data is corrected for upwind readings from 8:54 to 10:24 only.

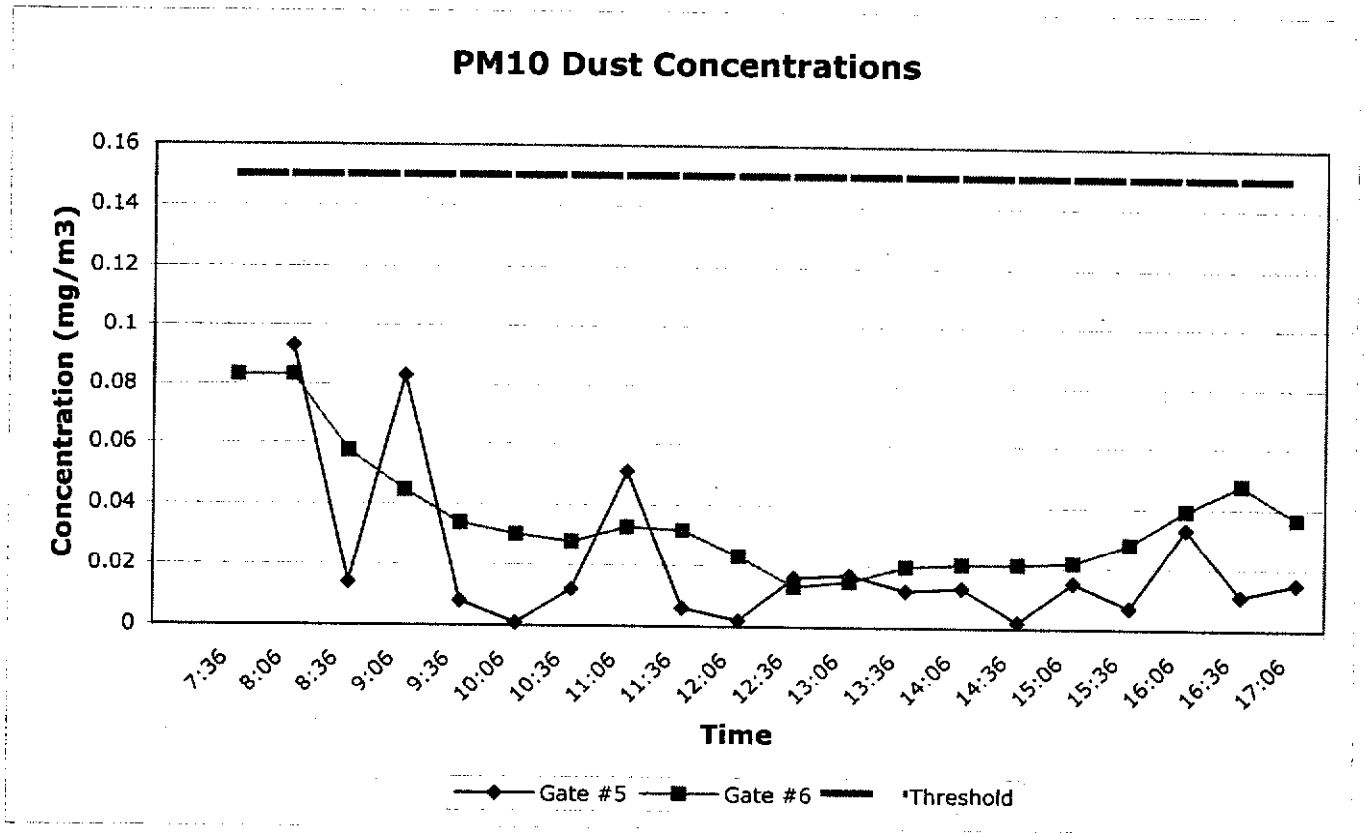
Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for September 2, 2003

Activities: Filling North Valley
Sifter Operation
Hauling from South Valley

Wind: From west. Speed not recorded.



Daily Average Concentrations:

Gate #4 (upwind)	Not Recorded
Gate #5	0.022
Gate #6	0.036

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
Data is not corrected for upwind dust concentrations. Upwind data not recorded.

Tourtelot Project
#1056/7001
By: JWO

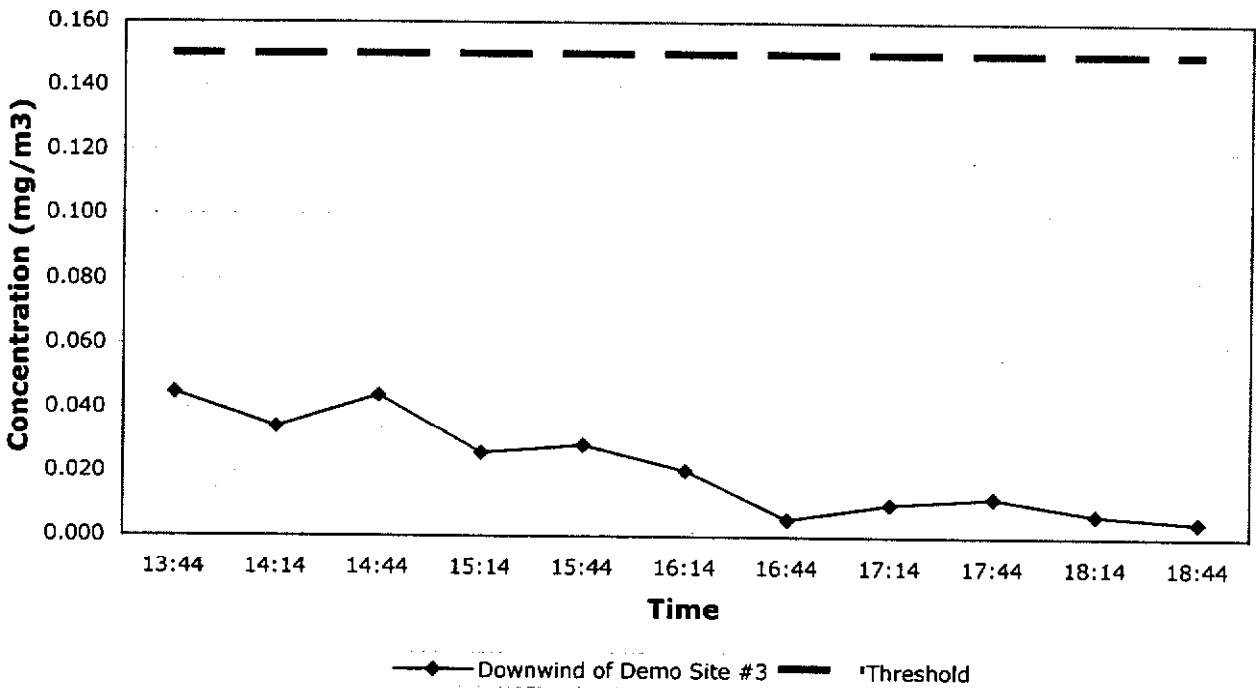
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for September 13, 2003

Activities: Excavating Demo Site #3 and halo.

Wind: From the East

PM10 Dust Concentrations



Daily Average Concentrations:

Downwind of Demo Site #3: 0.022 mg/m^3

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data.
*Monitor set out in afternoon following complaints of excessive dust.

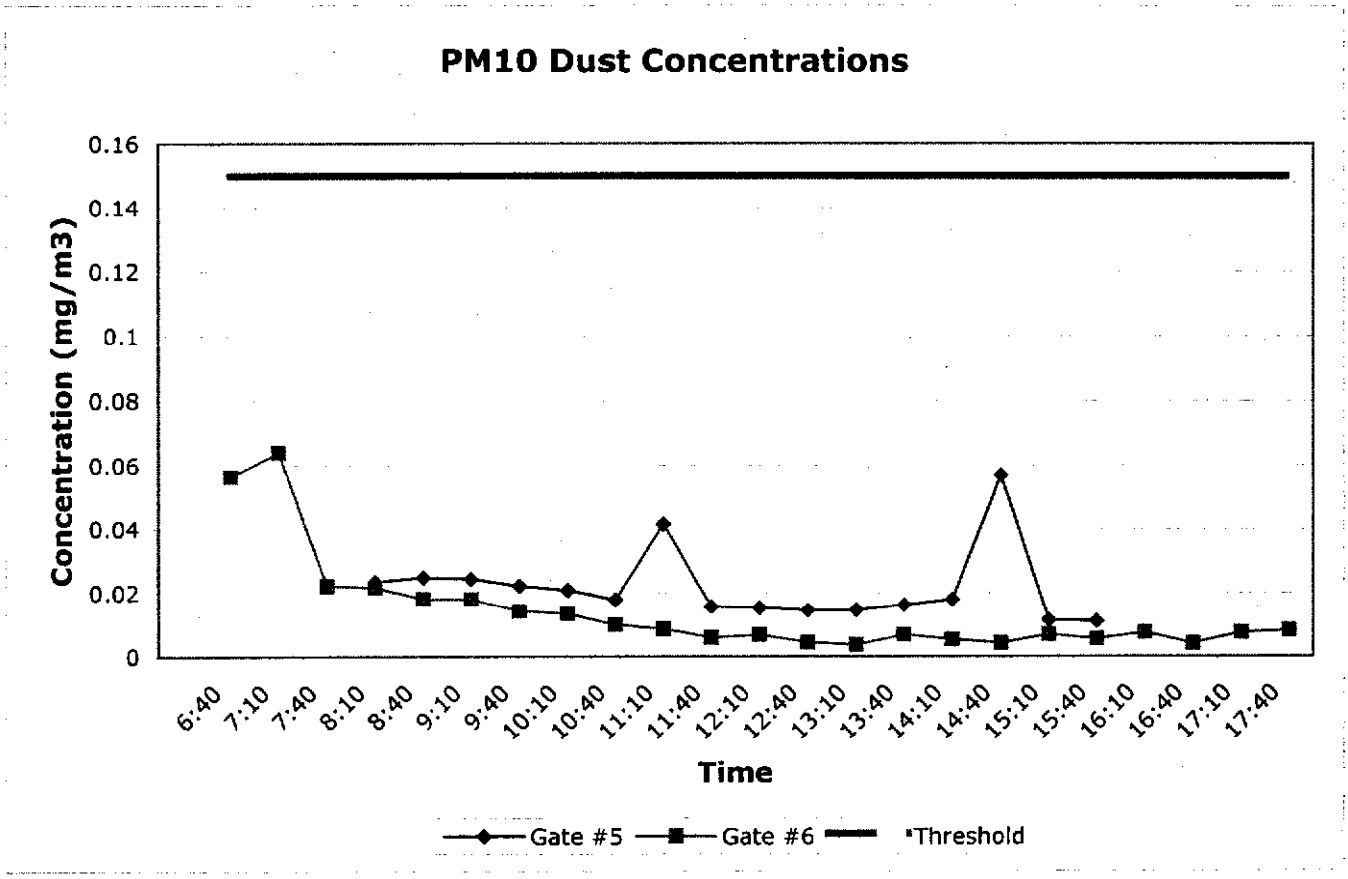
Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for September 17, 2003

Activities: Excavate TNT Strips
Sifter Operations

Wind: From the Southwest at 2 to 10 mph.



Daily Average Concentrations:

Gate #5	0.022
Gate #6	0.014

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
Upwind monitor not functioning. Data is not corrected for upwind values.

Tourtelot Project
#1056/7001
By: JWO

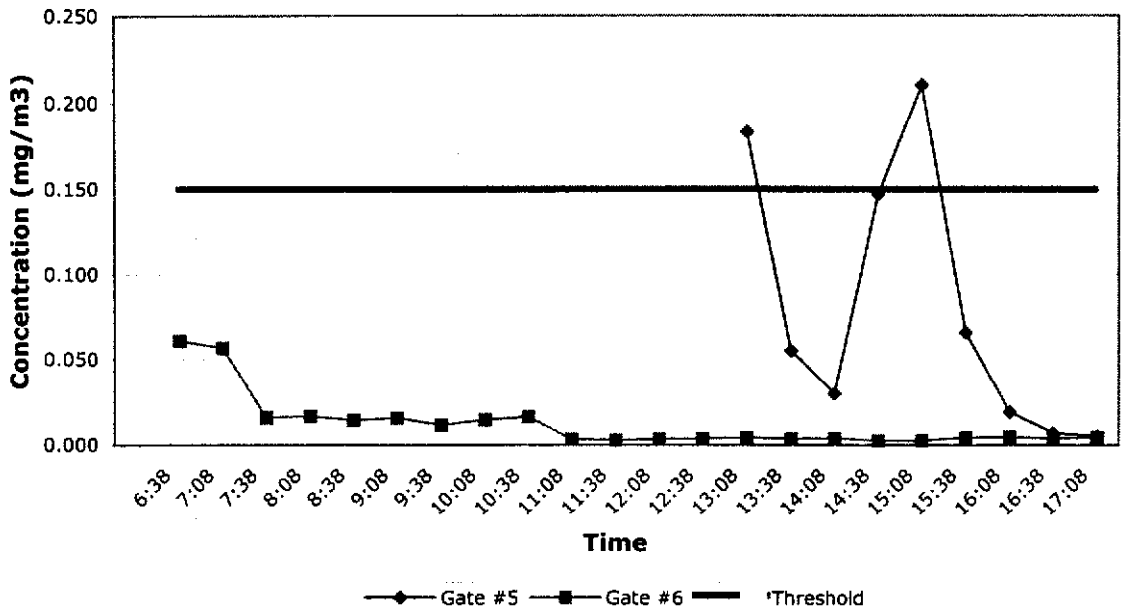
Northgate Environmental Management, Inc

Real-Time Air Monitoring Results for September 18, 2003

Activities: Excavate TNT Strips
Cut Keyway at East end of North Valley (adjacent to Gate 5).
Sifter Operations

Wind: From the West-southwest at 2 to 6 mph.

PM10 Dust Concentrations



Daily Average Concentrations:

Gate #5	0.080
Gate #6	0.012

Notes: *Threshold Value is for an average daily concentration based on gravimetric analysis of air filters, not real-time monitoring data. Filter data will be provided when available.
*Data is not corrected for upwind dust concentrations. Upwind data not recorded.

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 6, 2003

Activities Monitored: Excavation of Flare Site #3 and Mercury-impacted soils, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	---	---	---	1.000
8:30	---	---	---	1.000
9:00	---	---	---	1.000
9:30	0.008	0.011	0.004	1.000
10:00	0.008	0.040	0.033	1.000
10:30	0.008	0.051	0.043	1.000
11:00	0.007	0.046	0.039	1.000
11:30	0.006	0.034	0.028	1.000
12:00	0.005	0.056	0.051	1.000
12:30	0.004	0.033	0.028	1.000
13:00	0.003	0.044	0.041	1.000
13:30	0.003	0.026	0.023	1.000
14:00	0.003	0.019	0.016	1.000
14:30	0.005	0.023	0.018	1.000
15:00	0.005	0.065	0.060	1.000
15:30	---	---	---	1.000
16:00	---	---	---	1.000
16:30	---	---	---	1.000
17:00	---	---	---	1.000
Average	**0.005**	**0.037**	**0.032**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAY 1

S.V. FLARE TOUTELOT CL[illegible]P PROJECT MONITOR #

Air Monitoring Log - Work Area - ~~TNT Strips~~					
			Baseline:		mg/m³
			Day:	WEDNESDAY	
Dust > Baseline*	Response		Date:	8-6-03	
0 - 2.5 mg/m³	None		Temperature:	68-86	
> 2.5 mg/m³	Add'l Dust Mitigation		Wind Speed	15-20	Degrees F
			Wind Direction	W	

	READING AT LOCATION - Unit of Measure mg/m³				
TIME	25 Feet Upwind of Work Area	10 Feet Downwind of Work Area	Equip Oper Breathing Zone	Other Worker Breathing Zone	COMMENTS
			J WADDLE		
0700			—		
0730			—		
0800			—		
0830		EXCAVATOR	.006		
0900			.009		
1000		OPERATOR smoked	0.077		
1030		while working	0.275		
1100			0.224		
1130			0.223		
1200			0.242		
1230			0.296		
1300			0.293		
1330					
1400			0.322		
1430					
1500					
1530					
1600					

S.V. FLARE

TOUTELOT CLEAN UP PROJECT

MONITOR #

DAY 1

Air Monitoring Log - Work Area - ~~TKI Strips~~					
			Baseline:		mg/m³
			Day:	WEDNESDAY	
Dust > Baseline*	Response		Date:	8-6-03	
0 - 2.5 mg/m³	None		Temperature:	68-86	
>2.5 mg/m³	Add'l Dust Mitigation		Wind Speed	15-20	Degrees F
			Wind Direction	W	
	READING AT LOCATION - Unit of Measure mg/m³				
TIME	25 Feet Upwind of Work Area	10 Feet Downwind of Work Area	Equip Oper Breathing Zone	Other Worker Breathing Zone	COMMENTS
			A. COATES		
0700		HAUL TRUCK	—		
0730			—		
0800			—		
0830			.004		
0900			.085		
1000			.060		
1030			.050		
1100			.040		
1130			.035		
1200			.034		
1230			.031		
1300			.028		
1330			.023		
1400			.022		
1430			.019		
1500			.018		
1530					
1600					

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 7, 2003

Activities Monitored: Excavations in South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	---	0.059	*0.059*	1.000
8:30	---	0.057	*0.057*	1.000
9:00	---	0.011	*0.011*	1.000
9:30	---	0.012	*0.012*	1.000
10:00	---	0.011	*0.011*	1.000
10:30	---	0.018	*0.018*	1.000
11:00	---	0.027	*0.027*	1.000
11:30	---	0.027	*0.027*	1.000
12:00	---	0.022	*0.022*	1.000
12:30	---	0.020	*0.020*	1.000
13:00	---	0.007	*0.007*	1.000
13:30	0.005	---	---	1.000
14:00	0.005	0.016	0.011	1.000
14:30	0.006	0.015	0.009	1.000
15:00	0.007	0.019	0.012	1.000
15:30	0.007	0.014	0.008	1.000
16:00	0.007	0.030	0.024	1.000
16:30	0.004	0.055	0.051	1.000
17:00	---	---	---	1.000
Average	**0.006**	**0.025**	**0.023**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

TOURTELOT PROJECT
NORTHGATE - 1056.03.10

PERSONAL

AIR MONITORING LOG

ACTIVITY: HAUL PAK

DATE: 8-7-03

PERSONEL: THOMPSON

MONITOR # (SERIAL #) _____

- MANUALLY RECORD MEASUREMENTS EVERY 30 MINUTES
- ACTION LEVELS (REFER TO ADDENDUM 1 SSHP)

0 - 1 mg/m³ ABOVE UPWIND: NO ACTION

NOTIFY NORTHGATE IF OCCURS → 1.0 - 1.5 mg/m³ : IMPLEMENT ADDITIONAL DUST MITIGATION

→ 71.5 mg/m³ (2 CONSECUTIVE READINGS) : CEASE/STOP WORK UNTIL <1.0 mg/m³

TIME	READING (mg/kg)	ACTIVITY
07:00	0.102	
07:30	0.101	
08:00	0.005	
08:30	0.007	
09:00	0.006	
09:30	0.003	
10:00	0.000	
10:30	0.000	
11:00	0.000	
11:30	0.002	
12:00	0.000	
12:30	0.004	
13:00	0.010	
13:30	0.016	
14:00	0.020	
14:30	0.021	
15:00	0.022	
15:30	0.021	
16:00	0.020	
16:30	0.018	
17:00	0.017	

TOURTELOT PROJECT
NORTHGATE - 1056.03.10

PERSONAL

AIR MONITORING LOG

ACTIVITY: EXCAVATE

DATE: 8-7-03

PERSONEL: WADDLE

MONITOR # (SERIAL #) _____

- MANUALLY RECORD MEASUREMENTS EVERY 30 MINUTES
- ACTION LEVELS (REFER TO ADDENDUM 1 SSHP)

0 - 1 mg/m³ ABOVE UPWIND: NO ACTION

NOTIFY NORTHGATE IF OCCURS → 1.0 - 1.5 mg/m³ : IMPLEMENT ADDITIONAL DUST MITIGATION

→ >1.5 mg/m³ (2 CONSECUTIVE READINGS) : CEASE/STOP WORK UNTIL <1.0 mg/m³

TIME	READING (mg/kg)	ACTIVITY
07:00		
07:30		
08:00	0.121	
08:30	0.122	
09:00	0.121	
09:30	0.124	
10:00	0.126	
10:30	0.221	
11:00	0.342	
11:30	0.361	
12:00	0.362	
12:30	0.371	
13:00	0.365	
13:30	0.356	
14:00	0.272	
14:30	0.285	
15:00		
15:30		
16:00		
16:30		
17:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 8, 2003

Activities Monitored: Excavation of Demo Site #3 and Mercury-impacted soils, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	0.051	0.005	-0.046	1.000
8:30	0.048	0.005	-0.043	1.000
9:00	0.003	0.007	0.004	1.000
9:30	0.002	0.022	0.020	1.000
10:00	0.003	0.011	0.008	1.000
10:30	0.003	0.006	0.003	1.000
11:00	0.003	0.033	0.029	1.000
11:30	0.005	0.089	0.085	1.000
12:00	0.003	0.047	0.044	1.000
12:30	0.003	0.022	0.019	1.000
13:00	0.010	0.022	0.012	1.000
13:30	0.014	0.027	0.013	1.000
14:00	0.003	0.051	0.048	1.000
14:30	0.003	0.081	0.078	1.000
15:00	0.014	0.151	0.137	1.000
15:30	0.010	0.114	0.104	1.000
16:00	0.004	0.062	0.058	1.000
16:30	0.008	0.044	0.036	1.000
17:00	---	---	---	1.000
Average	**0.011**	**0.044**	**0.034**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 9, 2003

Activities Monitored: Excavation of Demo Site #3 and Mercury-impacted soils, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	0.003	*0.003*	1.000
8:00	0.047	0.010	-0.036	1.000
8:30	0.003	0.039	0.036	1.000
9:00	0.002	0.025	0.024	1.000
9:30	0.004	0.014	0.010	1.000
10:00	0.005	0.013	0.008	1.000
10:30	0.003	0.004	0.001	1.000
11:00	0.005	0.005	0.000	1.000
11:30	0.002	0.003	0.001	1.000
12:00	---	---	---	1.000
12:30	---	---	---	1.000
13:00	---	---	---	1.000
13:30	---	---	---	1.000
14:00	---	---	---	1.000
14:30	---	---	---	1.000
15:00	---	---	---	1.000
15:30	---	---	---	1.000
16:00	---	---	---	1.000
16:30	---	---	---	1.000
17:00	---	---	---	1.000
Average	**0.009**	**0.013**	**0.005**	**1.000**

Notes:
--Excavator broke down at approximately 10:30; was down for rest of day.
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

1

PERSONAL

AIR MONITORING LOG

ACTIVITY: SOUTH [illegible]

CRAG [illegible]

DATE: 8/4

MONITOR # _____

- MANUALLY RECORD MEASUREMENTS EVERY 30 MINUTES
- ACTION LEVELS (REFER TO ADDENDUM 1 SSHP)

	0-1 mg/m³ ABOVE UPWIND: NO ACTION
NOTIFY NORTHGATE IF OCCURS →	1.0-1.5 mg/m³ : IMPLEMENT ADDITIONAL DUST MITIGATION
→	>1.5 mg/m³ (2 CONSECUTIVE READINGS) : CEASE/STOP WORK UNTIL <1.0 mg/m³

Leads ↓

7:00 → .005

7:30 → .000

SAT 8:00 → .021

OE 300.30866.0

L3 570.76

TIME	READING	ACTIVITY
8:30	.025	WBS 29-10
MON 9:00	.027	
9:30	.012	
10:00	.018	ER 408-29-1-3074
10:30	.019	
11:00	.059	
11:30	.041	
12:00	.029	
12:30	.045	
13:00	.142	
13:30	.112	
29 14:00	.114	
14:30	.118	
15:00	.097	
15:30	.084	
16:00	.101	
16:30	.079	
17:00	[illegible]	

DAILY PERSONAL AIR MONITORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/11/03

Activity:_____
Personel:_____
Air Monitor #:_____

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30		
08:00		
08:30	Data	Sheet blew
09:00		
09:30	into	wetlands -
10:00		
10:30	not	retrieved.
11:00		
11:30		
12:00	Operator verbally	reported
12:30		
13:00	no	exceedances
13:30		
14:00		-DWO
14:30		
15:00		
15:30		
16:00		
16:30		
17:00		
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 12, 2003

Activities Monitored: Excavation of South Valley Flare Site and Demo Site #1

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	0.016	0.080	0.063	1.000
8:30	0.013	0.124	0.112	1.000
9:00	0.013	0.079	0.066	1.000
9:30	0.014	0.048	0.034	1.000
10:00	0.011	0.028	0.016	1.000
10:30	0.012	0.032	0.021	1.000
11:00	0.012	0.019	0.007	1.000
11:30	0.013	0.016	0.004	1.000
12:00	0.010	0.035	0.026	1.000
12:30	0.011	0.122	0.111	1.000
13:00	0.010	0.075	0.065	1.000
13:30	0.010	0.063	0.053	1.000
14:00	0.009	0.074	0.065	1.000
14:30	---	0.091	*0.091*	1.000
15:00	---	0.099	*0.099*	1.000
15:30	---	0.051	*0.051*	1.000
16:00	---	0.086	*0.086*	1.000
16:30	---	0.022	*0.022*	1.000
17:00	---	---	---	1.000
Average	**0.012**	**0.064**	**0.055**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/12/03

Activity: FIBRE REMOVAL
Personel: KANE
Air Monitor #: 3029

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00	—	
07:30	.016	
08:00	.022	
08:30	.026	
09:00	.039	
09:30	.034	
10:00	.037	
10:30	.029	
11:00	.034	
11:30	.036	
12:00	.033	
12:30	.039	
13:00	.039	
13:30	.033	
14:00	.041	
14:30	.036	
15:00	.035	
15:30	.034	
16:00	.029	
16:30	.029	
17:00	.031	
18:00		

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/12/03

Activity: FIARE REMOVAL
Personel: THOMPSON
Air Monitor #: 3031

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m^3 above upwind: No Action
1.0- 1.5 mg/m^3:Implement additional dust mitigation.
> 1.5mg/m^3 (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00	—	
07:30	.021	
08:00	.026	
08:30	.019	
09:00	.016	
09:30	.020	
10:00	.018	
10:30	.017	
11:00	.022	
11:30	.019	
12:00	.024	
12:30	.019	
13:00	.019	
13:30	.020	
14:00	.013	
14:30	.015	
15:00	.019	
15:30	.020	
16:00	.023	
16:30	.021	
17:00		
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 13, 2003

Activities Monitored: Excavation of South Valley Flare Site

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

Dust Concentrations (mg/m^3)			Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	0.035	*0.035*	1.000
8:00	---	0.026	*0.026*	1.000
8:30	---	0.025	*0.025*	1.000
9:00	---	0.032	*0.032*	1.000
9:30	---	0.035	*0.035*	1.000
10:00	---	0.046	*0.046*	1.000
10:30	---	0.037	*0.037*	1.000
11:00	---	0.042	*0.042*	1.000
11:30	---	0.052	*0.052*	1.000
12:00	---	0.042	*0.042*	1.000
12:30	---	0.027	*0.027*	1.000
13:00	---	0.040	*0.040*	1.000
13:30	---	0.023	*0.023*	1.000
14:00	---	0.096	*0.096*	1.000
14:30	---	0.117	*0.117*	1.000
15:00	---	0.055	*0.055*	1.000
15:30	---	0.027	*0.027*	1.000
16:00	---	0.071	*0.071*	1.000
16:30	---	0.143	*0.143*	1.000
17:00	---	---	---	1.000
Average	**---**	**0.051**	**0.051**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/13/03

Activity: South Valley
Personel: Thompson,
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00	.050	
07:30	.158	
08:00	.049	
08:30	.051	
09:00	.028	
09:30	.120	
10:00	.187	
10:30	.185	
11:00	.186	
11:30	.167	
12:00	.137	
12:30	.168	
13:00	.165	
13:30	.161	
14:00	.158	
14:30	.162	
15:00	.148	
15:30	.148	
16:00	.140	
16:30	.131	
17:00	.135	
18:00		

*battery went dead in other unit + no record kept

DAILY PERSONAL AIR MONITORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/13/03

Activity:_____
Personel:_____
Air Monitor #:_____

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m^3 above upwind: No Action
1.0- 1.5 mg/m^3:Implement additional dust mitigation.
> 1.5mg/m^3 (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30		
08:00		
08:30	Operator lost	
09:00		
09:30		
10:00	Data	Sheet —
10:30		
11:00	verbally	reported
11:30		
12:00		
12:30	no	exceedances
13:00		
13:30		Jwa
14:00		
14:30		
15:00		
15:30		
16:00		
16:30		
17:00		
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 14, 2003

Activities Monitored: Excavation of Demo Site #3, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	0.021	0.087	0.066	1.000
8:30	0.023	0.087	0.065	1.000
9:00	---	---	---	1.000
9:30	0.031	0.079	0.048	1.000
10:00	0.032	0.097	0.065	1.000
10:30	0.018	0.033	0.016	1.000
11:00	0.019	0.084	0.065	1.000
11:30	0.018	0.056	0.037	1.000
12:00	0.018	0.030	0.012	1.000
12:30	0.016	0.082	0.066	1.000
13:00	0.111	0.034	-0.077	1.000
13:30	0.058	0.039	-0.019	1.000
14:00	0.104	0.048	-0.056	1.000
14:30	0.111	0.045	-0.066	1.000
15:00	0.036	0.064	0.028	1.000
15:30	0.028	0.016	-0.012	1.000
16:00	0.013	0.012	-0.001	1.000
16:30	---	---	---	1.000
17:00	---	---	---	1.000
Average	**0.041**	**0.056**	**0.015**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/14/03

Activity: DEMO 1 & 3 HALL
Personel: THOMPSON
Air Monitor #: 3031

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00	.000	
07:30	.000	
08:00	.000	
08:30	.000	
09:00	.000	
09:30	.000	
10:00	.000	
10:30	.000	
11:00	.000	
11:30	.000	
12:00	.000	
12:30	.000	
13:00	.000	
13:30	.000	
14:00	.000	
14:30	.003	
15:00	.000	
15:30		
16:00		
16:30		
17:00		
18:00		

AMB
COSB

(Note: Batt. was changed
Intie time of readings
were registering.
* Rocket to NO DIFFERENCE.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/14/03

Activity: DEMO 1 & 3
Personel: KANE
Air Monitor #: 3034

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30		
08:00	.004	
08:30	.006	
09:00	.009	
09:30	.006	
10:00	.007	
10:30	.004	
11:00	.010	
11:30	.012	
12:00	.013	
12:30	.010	
13:00	.009	
13:30	.014	
14:00	.014	
14:30	.009	
15:00	.008	
15:30		
16:00		
16:30		
17:00		
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 15, 2003

Activities Monitored: Excavation of Demo Site #3, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	0.065	*0.065*	1.000
8:00	0.001	0.033	0.032	1.000
8:30	0.000	0.029	0.029	1.000
9:00	0.006	0.022	0.016	1.000
9:30	0.004	0.019	0.015	1.000
10:00	0.005	0.016	0.011	1.000
10:30	0.004	0.015	0.011	1.000
11:00	0.005	0.013	0.008	1.000
11:30	0.005	0.013	0.009	1.000
12:00	0.007	0.007	0.000	1.000
12:30	0.005	0.007	0.002	1.000
13:00	0.006	0.000	-0.006	1.000
13:30	0.003	0.004	0.001	1.000
14:00	0.004	0.003	0.000	1.000
14:30	0.005	0.010	0.005	1.000
15:00	0.005	0.009	0.004	1.000
15:30	0.005	0.008	0.003	1.000
16:00	0.005	0.005	0.001	1.000
16:30	0.004	0.007	0.002	1.000
17:00	0.005	0.006	0.001	1.000
Average	**0.004**	**0.015**	**0.011**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 16, 2003

Activities Monitored: Scraping North face soils, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	0.026	0.073	0.048	1.000
8:00	0.031	0.083	0.052	1.000
8:30	0.021	0.034	0.013	1.000
9:00	0.020	0.033	0.014	1.000
9:30	0.039	0.043	0.004	1.000
10:00	0.042	0.037	-0.005	1.000
10:30	0.019	0.045	0.026	1.000
11:00	0.036	0.032	-0.003	1.000
11:30	0.033	0.051	0.017	1.000
12:00	0.043	0.037	-0.006	1.000
12:30	0.053	0.027	-0.026	1.000
13:00	0.044	0.021	-0.024	1.000
13:30	0.022	0.017	-0.006	1.000
14:00	---	0.033	*0.033*	1.000
14:30	---	0.019	*0.019*	1.000
15:00	---	0.026	*0.026*	1.000
15:30	---	0.016	*0.016*	1.000
16:00	---	0.021	*0.021*	1.000
16:30	---	0.033	*0.033*	1.000
17:00	---	---	---	1.000
Average	**0.033**	**0.036**	**0.013**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 18, 2003

Activities Monitored: Excavation of Demo Site #3, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	0.062	*0.062*	1.000
8:00	---	0.063	*0.063*	1.000
8:30	0.020	0.020	0.000	1.000
9:00	0.013	0.013	0.000	1.000
9:30	0.014	0.026	0.013	1.000
10:00	0.016	0.019	0.002	1.000
10:30	0.008	0.016	0.008	1.000
11:00	0.008	0.019	0.011	1.000
11:30	0.008	0.008	0.000	1.000
12:00	0.016	0.013	-0.002	1.000
12:30	0.012	0.019	0.007	1.000
13:00	0.019	0.018	-0.002	1.000
13:30	0.020	0.021	0.001	1.000
14:00	0.018	0.026	0.007	1.000
14:30	0.009	0.020	0.011	1.000
15:00	0.008	0.010	0.002	1.000
15:30	0.012	0.013	0.001	1.000
16:00	0.020	0.019	-0.001	1.000
16:30	0.016	0.012	-0.004	1.000
17:00	---	---	---	1.000
Average	**0.014**	**0.022**	**0.009**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/12/03

Activity: South Valley
Personel: Thompson
Air Monitor #: 3831

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30		
08:00		
08:30		
09:00		
09:30		
10:00		
10:30		
11:00		
11:30		
12:00		
★ 12:30	.056	
13:00	.008	
13:30	.005	
14:00	.010	
14:30	.013	
15:00	.009	
15:30	.007	
16:00	.011	
16:30	.016	
17:00	.014	
18:00	.017	

Note - monitor was dropped and didn't start testing until 12:30

Craig

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/18/03

Activity: South Valley
Personel: KANE
Air Monitor #: 8029

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30	.016	
08:00	.013	
08:30	.014	
09:00	.010	
09:30	.018	
10:00	.020	
10:30	.016	
11:00	.013	
11:30	.013	
12:00	.018	
12:30	.016	
13:00	.020	
13:30	.021	
14:00	.023	
14:30	.026	
15:00	.020	
15:30	.018	
16:00	.021	
16:30	.018	
17:00		
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 19, 2003

Activities Monitored: Excavation of Demo Site #3, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	0.009	0.075	0.066	1.000
8:00	0.014	0.076	0.062	1.000
8:30	0.011	0.011	0.000	1.000
9:00	0.010	0.013	0.003	1.000
9:30	0.008	0.008	0.000	1.000
10:00	0.007	0.007	0.000	1.000
10:30	0.009	0.011	0.002	1.000
11:00	0.013	0.011	-0.001	1.000
11:30	0.016	0.010	-0.007	1.000
12:00	0.021	0.012	-0.009	1.000
12:30	0.010	0.009	0.000	1.000
13:00	0.006	0.007	0.001	1.000
13:30	0.007	0.008	0.001	1.000
14:00	0.009	0.006	-0.003	1.000
14:30	0.008	0.007	-0.001	1.000
15:00	0.022	0.017	-0.005	1.000
15:30	0.034	0.025	-0.009	1.000
16:00	0.040	0.031	-0.009	1.000
16:30	0.040	0.035	-0.005	1.000
17:00	0.028	0.023	-0.004	1.000
Average	**0.016**	**0.020**	**0.004**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date:

Activity: South Valley
Personel: Thompson
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

8/20 8/19/03
Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
.015 07:00	.066	
07:30	.168	
08:00	.117	
08:30	.111	
09:00	.090	
09:30	.091	
10:00	.084	
10:30	.064	
11:00	.060	
11:30	.058	
12:00	.066	
12:30	.082	
13:00	.069	
13:30	.077	
14:00	.081	
14:30	.079	
15:00	.068	
15:30	.071	
16:00		
16:30		
17:00		
18:00		

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/19/03

Activity: Excavator
Personel: Arlen Coates
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Readihg (mg/m3	Activity
07:00		Safty meeting
07:30	.165	Digging South Vally
08:00	.301	"
08:30	.284	"
09:00	.293	"
09:30	Changed Batteryes	"
10:00	.168	"
10:30	.153	"
11:00	.151	"
11:30	.149	"
12:00	.148	"
12:30	.149	"
13:00		OUT OF Vally
13:30		
14:00		
14:30		
15:00	.143	Digging South Vally
15:30	.145	"
16:00	.149	"
16:30	.151	"
17:00	.148	"
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 20, 2003

Activities Monitored: Excavation of Demo Site #3, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

Dust Concentrations (mg/m^3)			Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	0.067	*0.067*	1.000
8:00	0.015	0.071	0.055	1.000
8:30	0.018	0.023	0.006	1.000
9:00	0.026	0.023	-0.003	1.000
9:30	0.026	0.026	0.000	1.000
10:00	0.023	0.018	-0.005	1.000
10:30	0.022	0.015	-0.007	1.000
11:00	0.017	0.029	0.013	1.000
11:30	0.021	0.023	0.002	1.000
12:00	0.020	0.041	0.020	1.000
12:30	0.026	0.042	0.017	1.000
13:00	0.024	0.034	0.010	1.000
13:30	0.030	0.031	0.001	1.000
14:00	0.023	0.027	0.003	1.000
14:30	0.019	0.037	0.018	1.000
15:00	0.014	0.020	0.006	1.000
15:30	0.012	0.018	0.006	1.000
16:00	0.007	0.035	0.028	1.000
16:30	0.008	0.019	0.011	1.000
17:00	0.008	0.011	0.004	1.000
Average	**0.019**	**0.030**	**0.013**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/20/03

Activity: Haul Sand Away
Personel: Thompson
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

8/20/03

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00	.051	
07:30	.047	
08:00	.067	
08:30	.031	
09:00	.039	
09:30	.068	
10:00	.077	
10:30	.084	
11:00	.080	
11:30	.074	
12:00	.084	
12:30	.106	
13:00	.091	
13:30	.086	
14:00	.073	
14:30	.062	
15:00	.063	
15:30	.070	
16:00	.078	
16:30	.079	
17:00	.081	
18:00		

Pac States
Dump Truck
/CRAIG

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/20/03

Activity: Excavator South Valley
Personel: Kane
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00	.214	
07:30	.138	
08:00	.019	
08:30	.216	
09:00	.314	
09:30	.187	
10:00	.242	
10:30	.418	
11:00	.315	
11:30	.284	
12:00	.217	
12:30	.159	
13:00	.286	
13:30	.276	
14:00	.241	
14:30	.196	
15:00	.219	
15:30	.196	
16:00	.242	
16:30		
17:00		
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 21, 2003

Activities Monitored: Excavation of Demo Site #3, South Valley

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	0.032	0.017	-0.015	1.000
8:30	0.032	0.015	-0.018	1.000
9:00	0.020	0.036	0.016	1.000
9:30	0.019	0.034	0.015	1.000
10:00	0.017	0.056	0.039	1.000
10:30	0.017	0.048	0.032	1.000
11:00	0.016	0.068	0.051	1.000
11:30	0.018	0.068	0.050	1.000
12:00	0.014	0.030	0.016	1.000
12:30	0.015	0.028	0.013	1.000
13:00	0.014	0.033	0.019	1.000
13:30	0.015	0.028	0.013	1.000
14:00	0.014	0.032	0.019	1.000
14:30	0.014	0.030	0.016	1.000
15:00	0.016	0.024	0.008	1.000
15:30	0.016	0.016	0.000	1.000
16:00	0.012	0.013	0.001	1.000
16:30	0.012	0.024	0.011	1.000
17:00	---	---	---	1.000
Average	**0.017**	**0.033**	**0.016**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/21/03

Activity: Haul Pak
Personel: THOMPSON
Air Monitor #:

Manualy record measurements every 30 minutes.
Action levels (Refer to addendum 1 SSHP):
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

8/21/03

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00	.075	
07:30	.081	
08:00	.044	
08:30	.052	
09:00	.049	
09:30	.059	
10:00	.043	
10:30	.000	
11:00	.040	
11:30	.032	
12:00	.039	
12:30	.047	
13:00	.040	
13:30	.038	
14:00	.041	
14:30	.047	
15:00	.039	
15:30	.039	
16:00	.041	
16:30	.037	
17:00	.038	
18:00		

.003

Pacific States

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/21/03

Activity: EXCAVATOR
Personel: KIRE
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30	.053	
08:00	.058	
08:30	.041	
09:00	.046	
09:30	.038	
10:00	.042	
10:30	.048	
11:00	.052	
11:30	.056	
12:00	.056	
12:30	.058	
13:00	.060	
13:30	.059	
14:00	.052	
14:30	.050	
15:00	.048	
15:30	.050	
16:00	.051	
16:30	.056	
17:00		
18:00		

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 22, 2003

Activities Monitored: Hauling North face of South Valley soils

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	0.012	0.004	-0.008	1.000
8:30	0.009	0.004	-0.005	1.000
9:00	0.009	0.013	0.004	1.000
9:30	0.009	0.019	0.010	1.000
10:00	0.007	0.012	0.005	1.000
10:30	0.007	0.014	0.007	1.000
11:00	0.007	0.013	0.006	1.000
11:30	0.006	0.014	0.008	1.000
12:00	0.005	0.016	0.011	1.000
12:30	0.005	0.014	0.009	1.000
13:00	0.005	0.017	0.012	1.000
13:30	0.005	0.017	0.012	1.000
14:00	0.006	0.015	0.009	1.000
14:30	0.007	0.022	0.016	1.000
15:00	0.005	0.006	0.001	1.000
15:30	0.006	0.005	0.000	1.000
16:00	0.005	0.005	0.000	1.000
16:30	0.008	0.005	-0.003	1.000
17:00	0.009	0.009	0.001	1.000
Average	**0.007**	**0.012**	**0.005**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 23, 2003

Activities Monitored: Hauling North face of South Valley soils

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

	Dust Concentrations (mg/m^3)		Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	0.009	0.023	0.014	1.000
8:30	0.008	0.072	0.064	1.000
9:00	0.007	0.041	0.034	1.000
9:30	0.006	0.148	0.142	1.000
10:00	0.006	0.132	0.126	1.000
10:30	0.006	0.092	0.086	1.000
11:00	0.005	0.308	0.303	1.000
11:30	0.005	0.142	0.137	1.000
12:00	0.005	0.071	0.065	1.000
12:30	0.007	0.100	0.093	1.000
13:00	0.006	0.059	0.053	1.000
13:30	0.007	0.117	0.111	1.000
14:00	0.007	0.130	0.124	1.000
14:30	0.007	0.074	0.067	1.000
15:00	0.005	0.109	0.104	1.000
15:30	0.004	0.116	0.112	1.000
16:00	0.003	0.159	0.156	1.000
16:30	0.007	0.121	0.114	1.000
17:00	---	---	---	1.000
Average	**0.006**	**0.112**	**0.106**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/23/03

Activity: South Valley
Personel: Kane
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30	.024	
08:00	.036	
08:30	.036	
09:00	.032	
09:30	.041	
10:00	.033	
10:30	.026	
11:00	.029	
11:30	.037	
12:00	.038	
12:30	.035	
13:00	.041	
13:30	.039	
14:00	.036	
14:30	.038	
15:00	.041	
15:30	.038	
16:00	.033	
16:30	.036	
17:00		
18:00		

DAILY PERSONAL AIR MONIORING LOG

Tourtelot Project
Northgate 1056.03.10
Date: 8/23/03

Activity: South Valley
Personel: Thompson
Air Monitor #:

***Manualy record measurements every 30 minutes.**
***Action levels (Refer to addendum 1 SSHP):**
0-1 mg/m³ above upwind: No Action
1.0- 1.5 mg/m³:Implement additional dust mitigation.
> 1.5mg/m³ (after 2 consecutive readings):Stop work until levels reutrn to below 1.0.

Notify Northgate if levels reach above 1.0.

Time	Reading (mg/m3	Activity
07:00		
07:30	.021	
08:00	.022	
08:30	.024	
09:00	.019	
09:30	.018	
10:00	.017	
10:30	.013	
11:00	.018	
11:30	.017	
12:00	.013	
12:30	.014	
13:00	.018	
13:30	.019	
14:00	.016	
14:30	.016	
15:00	.017	
15:30	.018	
16:00	.019	
16:30	.016	
17:00		
18:00		

Tourtelot Project
#1056/7001
By: JWO

Northgate Environmental Management, Inc

Worker Area Air Monitoring Summary for August 25, 2003

Activities Monitored: Hauling North face of South Valley soils

Monitor Placement
Upwind: Approximately 10 feet upwind of active work area
Downwind: Approximately 25 feet downwind of active work area

Dust Concentrations (mg/m^3)			Downwind - Upwind Concentration	
Time	Upwind	Downwind	Concentration*	Action Level**
7:30	---	---	---	1.000
8:00	0.058	0.052	-0.006	1.000
8:30	0.041	0.077	0.036	1.000
9:00	0.019	0.095	0.076	1.000
9:30	0.020	0.124	0.104	1.000
10:00	0.018	0.069	0.052	1.000
10:30	0.017	0.197	0.180	1.000
11:00	0.011	0.152	0.141	1.000
11:30	0.012	0.112	0.100	1.000
12:00	0.014	0.140	0.126	1.000
12:30	0.014	0.112	0.098	1.000
13:00	0.014	0.071	0.058	1.000
13:30	0.013	0.094	0.080	1.000
14:00	0.012	0.136	0.124	1.000
14:30	0.012	0.178	0.166	1.000
15:00	0.010	0.165	0.155	1.000
15:30	0.008	0.127	0.119	1.000
16:00	0.006	0.136	0.130	1.000
16:30	0.007	0.306	0.299	1.000
17:00	0.007	0.419	0.412	1.000
17:30	0.009	0.346	0.338	1.000
Average	**0.016**	**0.155**	**0.139**	**1.000**

Notes:
*Italicized concentrations indicate a downwind reading without an upwind concentration correction.
**If Downwind - Upwind concentration exceeds 1.0 mg/m3, additional dust control measures are required.