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Stockpile and Post-Remedial Excavation Confirmation Report Parcel A, Report No. 9

Boeing Realty Corporation C-6 Facility
Los Angeles, California

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STOCKPILE AND POST-REMEDIAL EXCAVATION CONFIRMATION REPORT PARCEL A REPORT NO. 9

BOEING REALTY CORPORATION C-6 FACILITY LOS ANGELES, CALIFORNIA

March 1998

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SECTION 1.0

INTRODUCTION

In October 1996, Montgomery Watson (Montgomery) was retained by McDonnell Douglas Realty Company, now the Boeing Realty Corporation (BRC), to assist with the redevelopment of Parcel A (the Site) of their C-6 Facility located in Los Angeles, California. Figure 1 presents the C-6 Facility. Figure 2 delineates the Site. The Site was formerly used to manufacture and store aircraft parts.

1.1 OVERVIEW

The Site consists of the northernmost quarter of the C-6 Facility, encompassing approximately 50 acres. Demolition of the following buildings has occurred: Building 29, 33, 34, 36, 37, 40, 41, 43/44, 45, 57, 58, 61, 66-A, and 67.

Information gathered during the data compilation and evaluation phase of this project indicated the presence of petroleum products and other chemicals of concern in the surface and subsurface.

A soil sampling and remedial excavation effort was conducted in conjunction with the removal of foundations, slabs, and below-ground structures. The purpose of this effort was to assess soil quality and remove soil affected with petroleum hydrocarbons and other chemicals of concern in preparation for redevelopment of the Site. Soil which was determined to be affected with petroleum hydrocarbons and other chemicals was excavated and stockpiled at the Site. Confirmation samples were collected along the walls and floor of each remedial excavation to confirm that the surface soil (upper 12 feet) met soil screening criteria at sample locations.

Stockpiled soil and confirmation samples discussed in this report were generated from two remedial excavations conducted at two different locations at the Site.

1.2 PURPOSE AND OBJECTIVES

The lead agency for this project is the Los Angeles Regional Water Quality Control Board (RWQCB). The process of screening excavated soil and confirming *in situ* soil quality as presented in this document has been approved by the RWQCB. Following the initial review and implementation of this process, the RWQCB has allowed BRC to undertake excavation and backfilling operations without intermittent agency review. All BRC decisions based upon the approved soil screening process are documented for final agency review and approval. This approach was developed to expedite the soil quality evaluation process, and this report has been prepared to document the process used by BRC to evaluate excavated and residual soil at Site locations discussed herein.

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Specifically, the purpose and objectives of this report are:

1) To document the quality of the stockpiled soil generated from remedial excavations according to the Facility-wide soil screening criteria, and the process by which the stockpiled soils were divided into two categories: (a) soils requiring treatment or off-site disposal, and (b) soils suitable for use as construction backfill at the Site.

2) To document that surface soil (upper 12 feet) in each remedial excavation meets the established soil screening criteria.

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SECTION 2.0

REMEDIAL EXCAVATIONS

The southeastern portion of the Site is known as the "Panhandle" to Parcel A. This report discusses two remedial excavations conducted at two different locations within the Panhandle. A description of each remedial excavation location is presented below in the order in which excavation activities occurred.

Building 41

Building 41 was formally a boiler house used to service the facility. A remedial excavation was conducted when affected soil was discovered during the Building 41 demolition. This remedial excavation was recorded using the following nomenclature:

"Building #" (B41) - Remedial Excavation (RE) - Chronological Number (#)
e.g., B41-RE-1

Panhandle Pipeline

The boilers housed within Building 41 were fired with diesel fuel which was pumped into Building 41 via a network of underground pipelines. A remedial excavation was conducted when affected soil was discovered during removal of the pipeline south of Building 41. This remedial excavation was recorded using the following nomenclature:

Panhandle Pipeline (PPL) - Remedial Excavation (RE) - Chronological Number (#)
e.g., PPL-RE-1

The location of each remedial excavation discussed in this report is presented in Figure 3. A 20-foot by 20-foot grid was used to reference the locations of the remedial excavations.

Pertinent information related to the remedial excavations and the associated excavated soil discussed in this report is presented below.

Excavation	Approximate Volume	Date of Excavation	Excavated Soil Location
B41-RE-1	3,504 cu yds total	25 Nov 97 — 4 Dec 97	West of Site access road and south of Building 41.
PPL-RE-1	1,130 cu yds total	16 Dec 97	West of Site access road.

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2.1 SOIL SAMPLING

Hot spot sampling and confirmation sampling have been employed at the remedial excavations discussed in this report. Detailed procedures for these activities are outlined in the *Sampling and Analysis Plan for Demolition Activities at the Douglas Aircraft Company C-6 Facility* prepared by Integrated Environmental Services, Inc. (IESI, 1997(a)) which has been reviewed and approved by the RWQCB. In addition, land treatment sampling was performed on the excavated material. These procedures can be summarized as follows:

2.1.1 Hot Spot Sampling

Hot spot sampling was conducted at predetermined locations where former items of concern were located, and at other locations where demolition activities revealed soil which may have been affected by petroleum hydrocarbons or other chemicals of concern.

Hot spot samples were collected by first exposing "fresh" soil beneath the surface using a stainless steel utensil or similar device. A photoionization detector (PID) was used to measure headspace organic vapor concentrations in the freshly exposed soil at each location. Soil samples were collected for analysis where at least one of the following conditions existed: 1) the headspace volatile organic compound (VOC) reading exceeded 5 ppm, (2) areas where staining of the soil was visible, or (3) areas where odors were noticeable.

Soil samples were collected for analysis in pre-cleaned, stainless steel sleeves by driving the sleeve into the soil with a rubber mallet or drive sampler. The ends of the sleeves were then covered with Teflon film and secured with plastic end caps. A unique sample identification using the following nomenclature was written in indelible ink on a sample label and attached to the sleeve:

Building No. (B#) - Grab Sample (GS) - Chronological Number (#) - Sample Depth (feet)
e.g., B41-GS-4-3'

Sample sleeves were placed in a cooler with blue ice and transported under chain-of-custody to a State-certified laboratory for analysis. Hot spot samples have been analyzed according to the analytical schedule presented in Table 1.

Hot spot sample locations discussed in this report have been subsequently excavated and data collected from these samples are considered representative of the corresponding excavated soil quality.

2.1.2 Land Treatment Unit Sampling

During initial remedial excavation activities conducted within the Panhandle area, excavated soil was placed in stockpiles each consisting of approximately 250 cubic yards of soil. The stockpiling protocol was subsequently changed such that excavated soil was first placed adjacent to the remedial excavation. Heavy equipment (e.g., scrapers) were then used to

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transfer the excavated soil to stockpiles. PID readings were taken from each scraper load and used to segregate the excavated soil into the following stockpiles:

- PID <5 ppm — Stockpile MA
- PID 5 - 15 ppm — Stockpile MB
- PID 16 - 25 ppm — Stockpile MC
- PID 26 - 50 ppm — Stockpile MD
- PID >50 ppm — Stockpile ME

Note: "M" was used to designate metals-affec ted soil.

The maximum Stockpile size was chosen as 1000 cubic yards; if the quantity of a Stockpile exceeded 1,000 cubic yards, a sequence of Stockpiles would be specified by adding the suffix -A, -B, etc., to the Stockpile designation.

In a letter to IESI from the RWQCB dated October 24, 1997, the RWQCB approved submittals from BRC to remediate on-site and reuse VOC-impacted soil. Consequently, the previously created stockpiles in the Panhandle area were knocked down to create Land Treatment Units. Excavated soils which had not yet been moved with the scraper were left in place to form a Land Treatment Unit, bypassing the previously performed stockpiling procedure. Stockpile sampling was not performed.

Soil in the Land Treatment Units was turned and aerated using a bulldozer and other heavy equipment. Headspace readings were collected periodically from the Land Treatment Units using a PID. Generally, soil samples were collected for analysis when PID readings were less than 5 ppm.

Land Treatment Unit soil samples were collected for analysis in pre-cleaned, stainless steel sleeves by driving the sleeve into the soil with a rubber mallet or drive sampler. The ends of the sleeves were then covered with Teflon film and secured with plastic end caps. A unique sample identification using the following nomenclature was written in indelible ink on a sample label and attached to the sleeve:

Building No. (B#) - Land Treatment Unit Number (LTU#) - Grab Sample (GS) - Chronological Number (#)

e.g., B41-LTU1-GS-1

Sample sleeves were placed in a cooler with blue ice and transported under chain-of-custody to a State-certified laboratory for analysis.

Land Treatment Unit samples have been analyzed according to the analytical schedule presented in Table 1.

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2.1.3 Confirmation Sampling

Confirmation sampling was conducted to ensure that residual surface soil (upper 12 feet) met soil screening criteria at each excavation. Confirmation sampling was conducted along the walls and floor of each excavation.

Generally, soil removal continued at a particular location until the following conditions were met: 1) the headspace VOC reading in freshly exposed soil was less than or equal to 5 ppm, and soil staining was not visible, and odors were not noticeable, or 2) the maximum excavation depth of 12 feet had been reached. A confirmation sample was collected when these conditions were met. Iterations of additional soil excavation were conducted as required until confirmation sample analytical data indicated that *in situ* soil quality met the soil screening criteria established in Section 3.1 of this report, or the maximum excavation depth of 12 feet had been reached.

Confirmation soil samples were collected by first exposing "fresh" soil beneath the surface of a wall and floor of an excavation using a stainless steel utensil or similar device. Soil samples were collected for analysis in pre-cleaned, stainless steel sleeves by driving the sleeve into the soil with a rubber mallet or drive sampler. The ends of the sleeves were then covered with Teflon film and secured with plastic end caps. A unique sample identification using the following nomenclature was written in indelible ink on a sample label and attached to the sleeve:

Building No. (B#) - Grab Sample (GS) - Chronological Number (#) - Sample Depth (feet)
e.g., B41-GS-8-12'

Sample sleeves were placed in a cooler with blue ice and transported under chain-of-custody to a State-certified laboratory for analysis. Confirmation samples have been analyzed according to the analytical schedule presented in Table 1; however, some confirmation sample analyses were limited to target-specific chemicals once such analytes were identified either through previous sampling activities or historical site knowledge.

2.2 SOIL EXCAVATION

Remedial excavation to remove affected soil was conducted when one of the following conditions was discovered: (1) elevated PID readings greater than 5 ppm in hot spot samples, (2) visible staining, and (3) noticeable odors.

Remedial excavations were performed using heavy equipment (excavators, front-end loaders, end-dump trucks) associated with the building demolition effort. Air monitoring in accordance with South Coast Air Quality Management District Rule 1166 was conducted throughout remedial excavation activities.

The maximum depth of any excavation was approximately 12 feet below grade. Excavated soil was segregated based on the location from where it was removed. Soil stockpiles or

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Land Treatment Units were placed on asphalt or plastic sheeting. The locations of each stockpile and Land Treatment Unit are presented in Figures 4 through 7.

2.3 LAND TREATMENT UNIT SOIL QUALITY

Two remedial excavations were conducted at two different locations when affected soil was discovered during the demolition process.

2.3.1 B41-RE-1 Excavated Soil

Soil removal at remedial excavation B41-RE-1 began on November 25, 1997 and was completed on December 4, 1997.

Approximately 214 cubic yards of soil associated with this excavation was removed with an excavator, transported and stockpiled west of the Building 34 footprint as presented in Figure 4 (Stockpile A). Approximately 3,290 cubic yards of soil was removed with an excavator and placed adjacent to the B41-RE-1 remedial excavation; scrapers subsequently moved 1,790 cubic yards of this excavated soil to stockpiles west of the Building 34 footprint as presented in Figure 4 (Stockpiles MB-A, MC-A, MD-A, and ME-A). Land Treatment Unit B41-LTU-1 was subsequently created from Stockpiles A, MB-A, MC-A, MD-A, and ME-A, as indicated in Figure 5. Land Treatment Unit B41-LTU-2 was created from the remaining 1,500 cubic yards of excavated soil adjacent to the excavation, as presented in Figure 6.

The following types of samples have been collected and analyzed to evaluate the soil quality in B41-RE-1 excavated soil:

- Excavated hot spot samples
- Land Treatment Unit samples

Five hot spot samples were collected at the locations presented in Figure 8; the areas around these locations were later excavated. The analytical data for these samples are summarized in Table 2.

Five Land Treatment Unit samples were collected. The locations of these samples are presented in Figure 5 and Figure 6. Analytical data for these samples are summarized in Table 3.

A complete set of laboratory analytical reports is presented in Appendix A-1.

2.3.2 PPL-RE-1 Excavated Soil

Soil removal at remedial excavation B36-RE-1 was conducted on December 16, 1997.

Approximately 1,130 total cubic yards of soil associated with this excavation was removed with an excavator and placed adjacent to the excavation. Scrapers subsequently moved this

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excavated soil to Land Treatment Units west of the Building 34 footprint as presented in Figure 7 (Land Treatment Units PH-LTU-2 and PH-LTU-2A).

The following types of samples have been collected and analyzed to evaluate the soil quality in PPL-RE-1 excavated soil:

- Excavated hot spot sample
- Land Treatment Unit samples

One hot spot sample was collected at the location presented in Figure 8; the area around this location was later excavated. The analytical data for this sample are summarized in Table 4.

Two Land Treatment Unit samples were collected. The locations of these samples are presented in Figure 7. Analytical data for these samples are summarized in Table 5.

A complete set of laboratory analytical reports is presented in Appendix A-2.

2.4 CONFIRMATION SAMPLING

2.4.1 B41-RE-1 Remedial Excavation

Six confirmation samples were collected at locations presented in Figure 9. Analytical data are summarized in Table 6. A complete set of analytical data is presented in Appendix B-1.

2.4.2 PPL-RE-1 Remedial Excavation

Two confirmation samples were collected at locations presented in Figure 9. The analytical data for these samples are summarized in Table 7. A complete set of laboratory analytical reports is presented in Appendix B-2.

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SECTION 3.0

DATA SUMMARIES AND CONCLUSIONS

This section presents soil screening criteria and the methodology used throughout the project to evaluate: (1) whether the soil stockpiles were suitable for use as backfill, or required treatment and/or off-site disposal, and (2) whether all affected soil has been removed based on confirmation sample data, or if additional excavation of affected soil is warranted.

3.1 SOIL SCREENING CRITERIA

The soil screening criteria have been developed to satisfy two primary objectives: (1) residual concentrations in backfill material and surface soil must be below levels projected to impact underlying drinking water sources, and (2) residual concentration in backfill materials and surface soil must be below levels projected to potentially impact human health under future construction and commercial/industrial activities at the Site.

In accordance with these objectives, soil screening criteria were developed for both drinking water and human health protection. The development of these soil screening criteria is discussed below followed by a summary of how these values were implemented.

3.1.1 Drinking Water

The generalized hydrostratigraphic succession at the Site is as follows (Kennedy/Jenks, 1996; Dames & Moore, 1993; Department of Water Resources, 1961):

SURFACE
Bellflower Aquitard
Gage Aquifer
El Segundo Aquitard
Lynwood Aquifer

Depth to groundwater at the Site is approximately 65 feet. Hydrostratigraphic information from voluminous data collected at the neighboring Del Amo and Montrose Chemical Superfund Sites can be correlated with subsurface information collected at the Site. Hydrostratigraphic correlations suggest that the shallowest groundwater at the Site occurs in the Bellflower Aquitard, which is not recognized as a drinking water source in the region (Dames & Moore, 1993).

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Although the depth to the top of the Gage Aquifer should vary from approximately 120 to 150 feet (from west to east) across the Site, the Gage Aquifer is not utilized as a source of drinking water in the region (Dames & Moore, 1993). Consequently, the shallowest drinking water resource in the region would therefore be the Lynwood Aquifer, projected to occur at the depths of approximately 210 to 240 feet (from west to east) across the Site.

Based on the depth to the first drinking water source, the following permissible concentrations to 12 feet below ground surface have been approved by the RWQCB:

Analytes	Permissible Level
TRPH	
C4 - C12	2,000 mg/kg
C13 - C22	10,000 mg/kg
C22+	50,000 mg/kg
Metals	TTLC and STLC

Notes:
TTLC: Total Threshold Limit Concentration per CCR Title 22.
STLC: Soluble Threshold Limit Concentration per CCR Title 22.

A Waste Extraction Test (WET) is performed on samples with total metal concentration(s) greater than 10 times the STLC but less than the TTLC, per CCR Title 22.

3.1.2 Human Health

Site-specific health-based soil screening values were developed by IESI using standard United States Environmental Protection Agency (USEPA) and California Environmental Protection Agency (Cal/EPA) methodologies. These values were derived assuming future commercial industrial land use with an interim construction phase. Each value will be used as a predictor of the risk posed by individual VOC, SVOC, PCB, and metal contaminants in soil. The additive effects of multiple contaminants have been accounted for by setting conservative target risk levels at $1x10^{-6}$ for carcinogens and 0.2 for toxicants. The final cumulative risks for all residual contaminants at the Site will be addressed in the post-remedial risk assessment. Table 8 summarizes the Site-specific health-based soil screening values to be used at the Site. A more detailed discussion of the methodologies used to derive these values has been presented in the *Health-Based Remediation Goals for Surface Soils* document (IESI, 1997(b)).

3.1.3 Evaluation Process

EXCAVATED SOIL

Soil excavated at the Site was generally subjected to the soil screening evaluation process depicted in Figure 10. This evaluation process incorporates both drinking water and human health-based criteria. Soils that failed any portion of this test were subjected to treatment

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prior to use as backfill, or were disposed of off-site. Once soils passed all aspects of the evaluation procedure, they were used for backfill.

Additionally, metal concentration(s) in stockpiled soils were used to further characterize the waste soil as follows:

a) Excavated soils were classified as non-RCRA hazardous waste if representative soil samples contained any metal in total concentration equal to or greater than its respective TTLC per CCR Title 22.

b) Representative soil samples were analyzed for soluble metal concentration using the Waste Extraction Test (WET) if the total concentration of any metal was equal to or greater than 10 times its respective STLC but less than its TTLC per CCR Title 22. Excavated soil was classified as non-RCRA hazardous waste if representative soil samples contained any metal in soluble concentration using the WET equal to or greater than its respective STLC per CCR Title 22.

c) Additionally, representative soil samples which were analyzed using the WET were also analyzed for soluble metal concentrations using the Toxic Characteristic Leaching Procedure (TCLP). Excavated soil was classified as a RCRA characteristic hazardous waste if the soluble concentration of any metal using the TCLP was equal to or greater than the toxicity characteristic (TC) per CCR Title 22.

CONFIRMATION SAMPLES

Confirmation soil data at the Site were generally subjected to the soil screening evaluation process depicted in Figure 11. This evaluation process incorporates both drinking water and human health-based criteria. Additional soil excavation and/or treatment was conducted at locations where confirmation sample data failed any portion of this test, and the maximum excavation depth of 12 feet had not been reached.

3.2 EXCAVATED SOIL EVALUATIONS

Chemicals of concern at the Site can be summarized as follows:

- Petroleum hydrocarbons
- VOCs
- SVOCs
- PCBs
- Metals

The sampling and analysis program for remedial excavations discussed in this report was conservatively focused on these chemicals of concern by implementing the following analytical schedule:

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- All hot spot samples were analyzed for TRPH and metals.

- All hot spot samples which contained TRPH in concentration greater than 10,000 mg/kg were subsequently analyzed for carbon chain length.

- Hot spot samples were selectively analyzed for VOCs, SVOCs, hydrocarbon fuel characterization, and PCBs, depending on the potential for occurrence of these chemicals at the sampling location.

- All Land Treatment Unit samples were analyzed for metals, VOCs, and SVOCs.

Excavated soil evaluations and dispositions are discussed below and summarized in Table 9.

3.2.1 B41-RE-1 Excavated Soil

Soil excavated from remedial excavation B41-RE-1 was initially placed in Stockpiles A, MB-A, MC-A, MD-A, ME-A, and adjacent to the excavation. Soil samples associated with Stockpiles A, MB-A, MC-A, MD-A, ME-A, and the soil placed adjacent to the excavation are presented in Table 2. These data are summarized and evaluated below.

Petroleum Hydrocarbons: Excavated hot spot sample B41-GS-5-1' (Stockpile A) contained TRPH in concentration of 32,000 mg/kg. This concentration exceeded the permissible limit for petroleum hydrocarbons and therefore the sample was speciated. The sample did not meet or exceed the permissible limits for specific hydrocarbon chains. Excavated hot spot sample PL-GS-13-5' (Stockpile A) contained TRPH in concentration of 4,200 mg/kg. This concentration was below the permissible limit for petroleum hydrocarbons; however, product line (PL) hot spot samples were speciated to be conservative. The excavated PL hot spot sample did not meet or exceed the permissible limits for specific hydrocarbon chains. All other excavated hot spot samples contained TRPH in concentration below the permissible limit and therefore were not speciated.

VOCs: VOCs were detected in three samples; however, all VOC concentrations were below Site-specific health-based soil screening values.

SVOCs: SVOCs were detected in two samples, however, all SVOC concentrations were below Site-specific health-based soil screening values.

PCBs: PCBs were not detected.

Metals: Excavated hot spot sample B41-GS-5-1' (Stockpile A) contained arsenic (350 mg/kg) above the Site-specific health-based soil screening value of 14 mg/kg. This sample also exceeded the STLC when analyzed using the WET, but did not exceed the TC when analyzed using the TCLP. Excavated hot spot sample B41-GS-6-1' (excavated soil placed adjacent to B41-RE-1) contained arsenic (51 mg/kg) above the Site-specific health-based soil screening value and also exceeded 10 times the STLC value for arsenic; however,

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this sample did not meet or exceed the STLC when analyzed using the WET or the TC when analyzed using the TCLP. Excavated hot spot samples B41-GS-4-3' and PL-GS-13-5' (both Stockpile A) also exceeded the Site-specific health-based soil screening value for arsenic, but did not meet or exceed TTLC or 10 times the STLC. The remaining excavated hot spot sample did not meet or exceed TTLC, 10 times the STLC, or Site-specific health-based soil screening values.

Disposition: The 18-cubic yard portion of Stockpile A containing excavated hot spot sample B41-GS-5-1' was separated from the remainder of Stockpile A as indicated in Figure 5. This soil will be removed from the Site by a licensed hazardous waste hauler and properly disposed as a non-RCRA hazardous waste. Off-site disposal documentation will be provided in an addendum to this report. The remainder of Stockpile A and Stockpiles MB-A, MC-A, MD-A, and ME-A were further treated by the Land Treatment Unit process to remove VOCs as B41-LTU-1. The excavated soil placed adjacent to B41-RE-1 was also treated by the Land Treatment Unit process as B41-LTU-2.

Land Treatment Unit soil samples from B41-LTU-1 and B41-LTU-2 are presented in Table 3. These data are summarized and evaluated below.

Petroleum Hydrocarbons: Excavated hot spot samples were analyzed for TRPH and met permissible limits. Therefore, Land Treatment Unit samples were not submitted for analysis of TRPH.

VOCs: VOCs were not detected.

SVOCs: SVOCs were detected in two samples. The concentration of benzo(a)pyrene in excavated hot spot sample PL-GS-13-5' (3.80 mg/kg) (Stockpile A) exceeded the site-specific health-based screening value for this compound of 1.14 mg/kg.

PCBs: Stockpile samples were analyzed for PCBs and no PCBs were detected. Therefore, Land Treatment Unit samples were not submitted for analysis of PCBs.

Metals: Land Treatment Unit sample PH-LTU-2A-GS-1 contained arsenic (14 mg/kg) equal to the Site-specific health-based soil screening value of 14 mg/kg, but did not meet or exceed TTLC or 10 times the STLC. The other samples did not meet or exceed TTLC, 10 times the STLC, or Site-specific health-based soil screening values.

Conclusion: Land Treatment Unit samples were considered by IESI to be more representative of soil quality than other samples. Although B41-LTU-1 contained excavated hot spot samples with arsenic in concentration greater than the Site-specific health-based soil screening value, IESI determined that the soil was acceptable for backfill. Land Treatment Unit B41-LTU-1 therefore was used as backfill material. Portions of B41-LTU-1 have not yet been backfilled; the final location of the remaining B41-LTU-1 soil will be provided in an addendum to this report.

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B41-LTU-2 includes an excavated hot spot sample (B41-GS-6-1') which contained arsenic above the Site-specific health-based screening value. The portion of B41-LTU-2 which contains excavated hot spot sample B41-GS-6-1' will separated from the remainder of B41-LTU-2. This soil will be removed from the Site and disposed off-site as non-hazardous waste. The remaining portion of B41-LTU-2 will be used as backfill material. Additional samples will also be collected from B41-LTU-2 to determine the extent of soil to be separated from B41-LTU-2. Off-site disposal documentation, the location of the backfilled soil, and additional sample data will be provided in an addendum to this report.

3.2.2 PPL-RE-1 Excavated Soil

Soil excavated from remedial excavation PPL-RE-1 was initially placed in Land Treatment Units PH-LTU-2 and PH-LTU-2A. Soil samples associated with Land Treatment Units PH-LTU-2 and PH-LTU-2A are presented in Table 4 and Table 5. These data are summarized and evaluated below.

Petroleum Hydrocarbons: Excavated hot spot sample PL-GS-14-2' contained TRPH in concentration of 4,600 mg/kg. This concentration was below the permissible limit for petroleum hydrocarbons; however, PL hot spot samples were speciated to be conservative. The excavated PL hot spot sample did not meet or exceed the permissible limits for specific hydrocarbon chains. Therefore, Land Treatment Unit samples were not submitted for analysis of TRPH.

VOCs: VOCs were detected in the excavated hot spot sample; however, all VOC concentrations were below Site-specific health-based soil screening values. VOCs were not detected in the Land Treatment Unit samples.

SVOCs: SVOCs were detected in the excavated hot spot sample. The concentration of benzo(a)pyrene (4.00 mg/kg) exceeded the site-specific health-based screening value for this compound of 1.14 mg/kg. All other SVOC concentrations were below Site-specific health-based soil screening values. SVOCs were not detected in the Land Treatment Unit samples.

PCBs: PCBs were not detected in the excavated hot spot sample. Therefore, Land Treatment Unit samples were not submitted for analysis of PCBs.

Metals: Land Treatment Unit sample PH-LTU-2A-GS-1 The samples did not meet or exceed TTLC, 10 times the STLC, or Site-specific health-based soil screening values.

Conclusion: Land Treatment Unit samples were considered to be more representative of excavated soil quality by IESI. The data show that soil in Land Treatment Units PH-LTU-2 and PH-LTU-2A met the soil screening criteria presented in Section 3.1 of this report and therefore will be used as backfill material. The location of the backfilled soil will be provided in an addendum to this report.

BOE-C6-0034633

3.3 IN-SITU SOIL QUALITY

The post-remedial excavation confirmation sampling analytical program (see Table 1) was designed to ensure that residual soils (upper 12 feet) meet the soil screening criteria.

3.3.1 B41-RE-1 Remedial Excavation

Confirmation sample data are presented in Table 6 and can be summarized as follows:

Petroleum hydrocarbons: The concentration of TRPH in confirmation sample B41-GS-8-12' (11,000 mg/kg) exceeded the permissible limit for petroleum hydrocarbons and therefore was speciated; this sample exceeded the permissible limit for the C13 - C22 hydrocarbon chain range. However, the sample was collected at the maximum excavation depth of 12 feet and no further excavation was performed. All other samples contained TRPH in concentration below the permissible limit and therefore were not speciated.

VOCs: VOCs were detected in four samples; however, all VOC concentrations were below Site-specific health-based soil screening values.

SVOCs: SVOCs were detected in two samples; however, all SVOC concentrations were below Site-specific health-based soil screening values.

PCBs: PCBs were not detected.

Metals: None of the samples met or exceeded TTLC, 10 times the STLC, or Site-specific health-based soil screening values.

Conclusion: The data show that the residual soils in the B41-RE-1 excavation met the soil screening criteria established in Section 3.1 of this report. Accordingly, this remedial excavation was backfilled.

3.3.2 PPL-RE-1 Remedial Excavation

Confirmation sample data are presented in Table 7 and can be summarized as follows:

Petroleum hydrocarbons: The samples were not submitted for analysis of TRPH.

VOCs: The samples were not submitted for analysis of VOCs.

SVOCs: SVOCs were not detected.

PCBs: The samples were not submitted for analysis of PCBs.

Metals: None of the samples met or exceeded TTLC, 10 times the STLC, or Site-specific health-based soil screening values.

BOE-C6-0034634

Conclusion: The data show that the residual soils in the PPL-RE-1 excavation met the soil screening criteria established in Section 3.1 of this report. Accordingly, this remedial excavation was backfilled.

BOE-C6-0034635

SECTION 4.0

REFERENCES

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Geraghty & Miller, Baseline Risk Assessment, International Light Metals Division Facility, Prepared for Lockheed Martin Corporation, March 1996.

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Integrated Environmental Services, Inc., Health-Based Remediation Goals for Surface Soils, 1997(b).

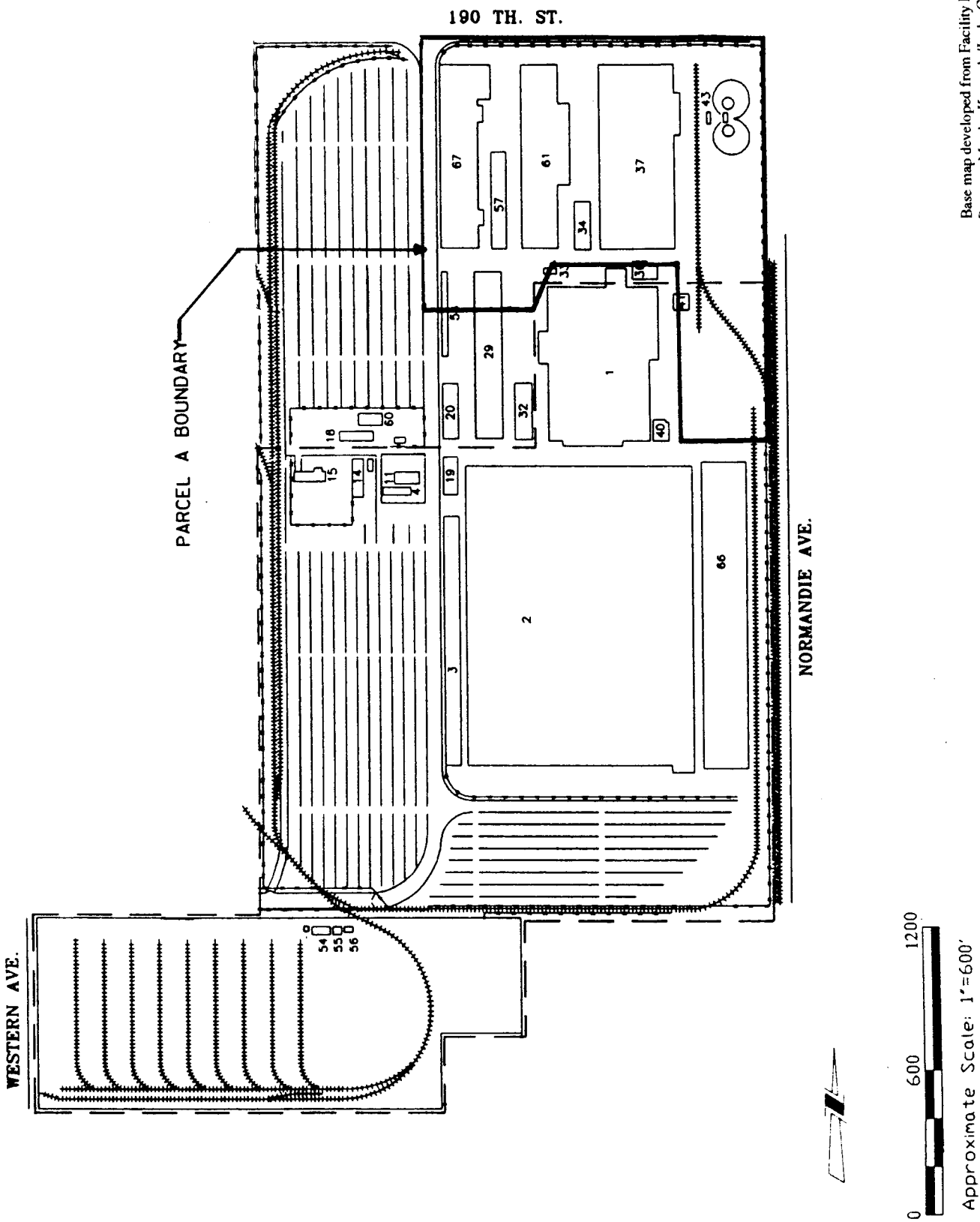
Kennedy/Jenks Consultants, Final Phase II Subsurface Investigation, Douglas Aircraft Company C-6 Facility, Parcel A, Torrance, California, June 5, 1996.

BOE-C6-0034636

Figures

MONTGOMERY WATSON

BOE-C6-0034637

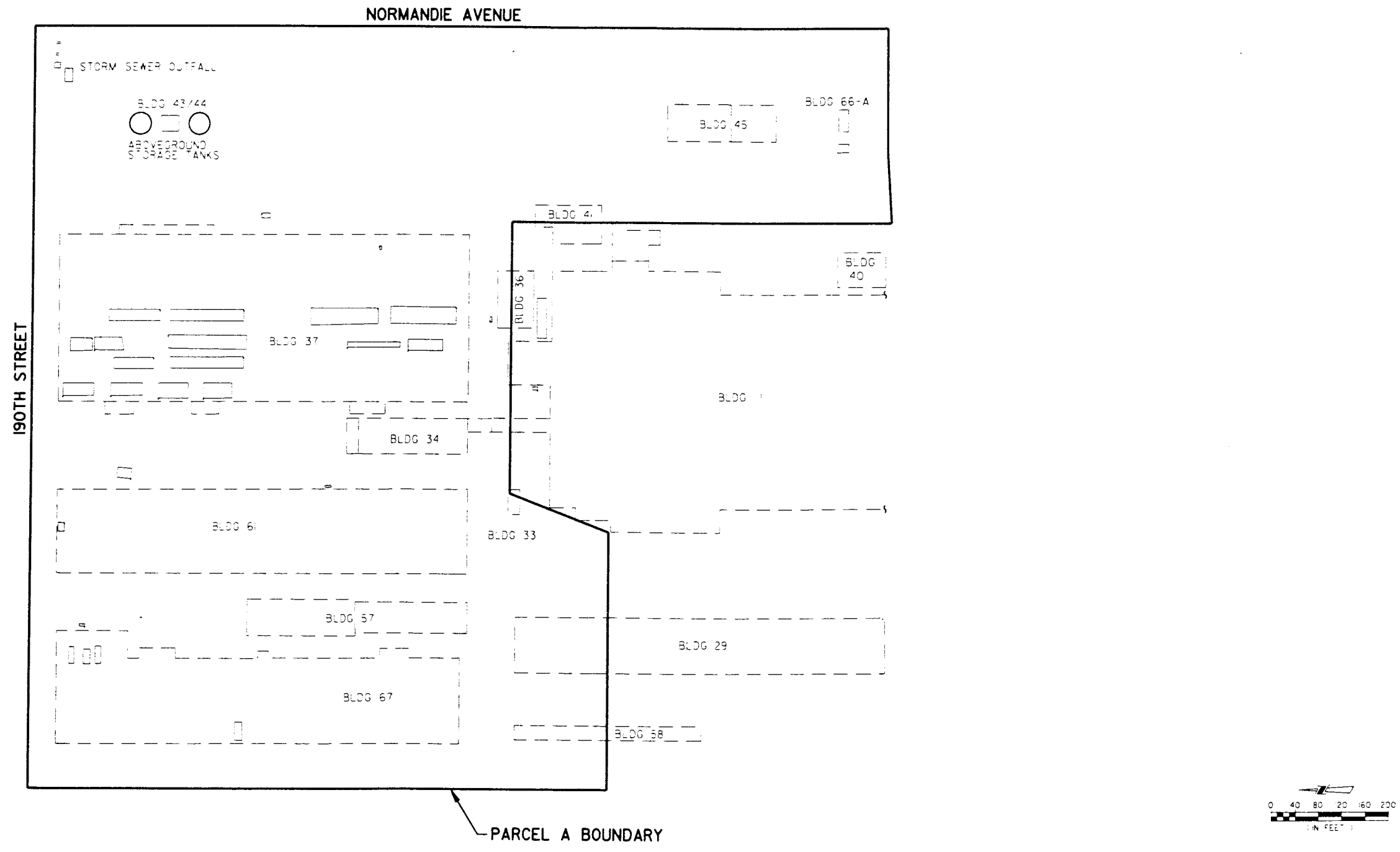


Base map developed from Facility Layout and Subject Property Map by Kennedy/Jenks Consultants, May 1996.

MONTGOMERY WATSON

C-6 FACILITY MAP

FIG. 1



BASE MAP DEVELOPED FROM TAIT & ASSOCIATES INC. SURVEY DRAWING DATED 10/22/96.

JOB No. ____ FILE No. ____

REV	DATE	BY	DESCRIPTION

SCALE: AS SHOWN

DESIGNED ____
DRAWN N. CHRAKIAN
CHECKED S. REINERS

SUBMITTED
PROJECT ENGINEER ____ R. C. E. NO. ____ DATE ____
RECOMMENDED
MONTGOMERY WATSON ____ R. C. E. NO. ____ DATE ____

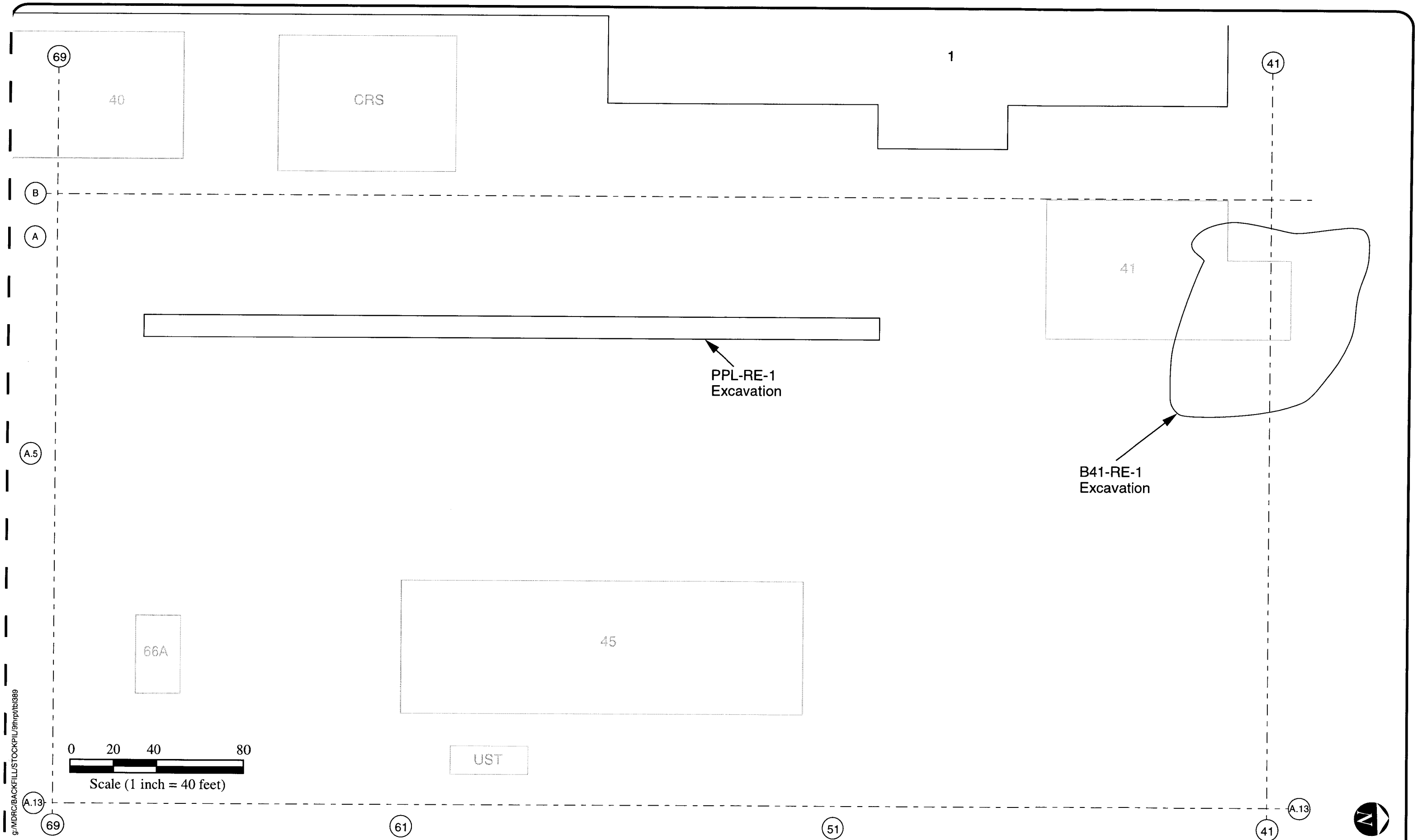
MONTGOMERY WATSON
Pasadena, California

APPROVED ____ DATE ____
APPROVED ____ DATE ____

BOEING REALTY CORPORATION
PARCEL A
SITE MAP

SHEET FIG. 2 OF • SHEETS

BOE-C6-0034639



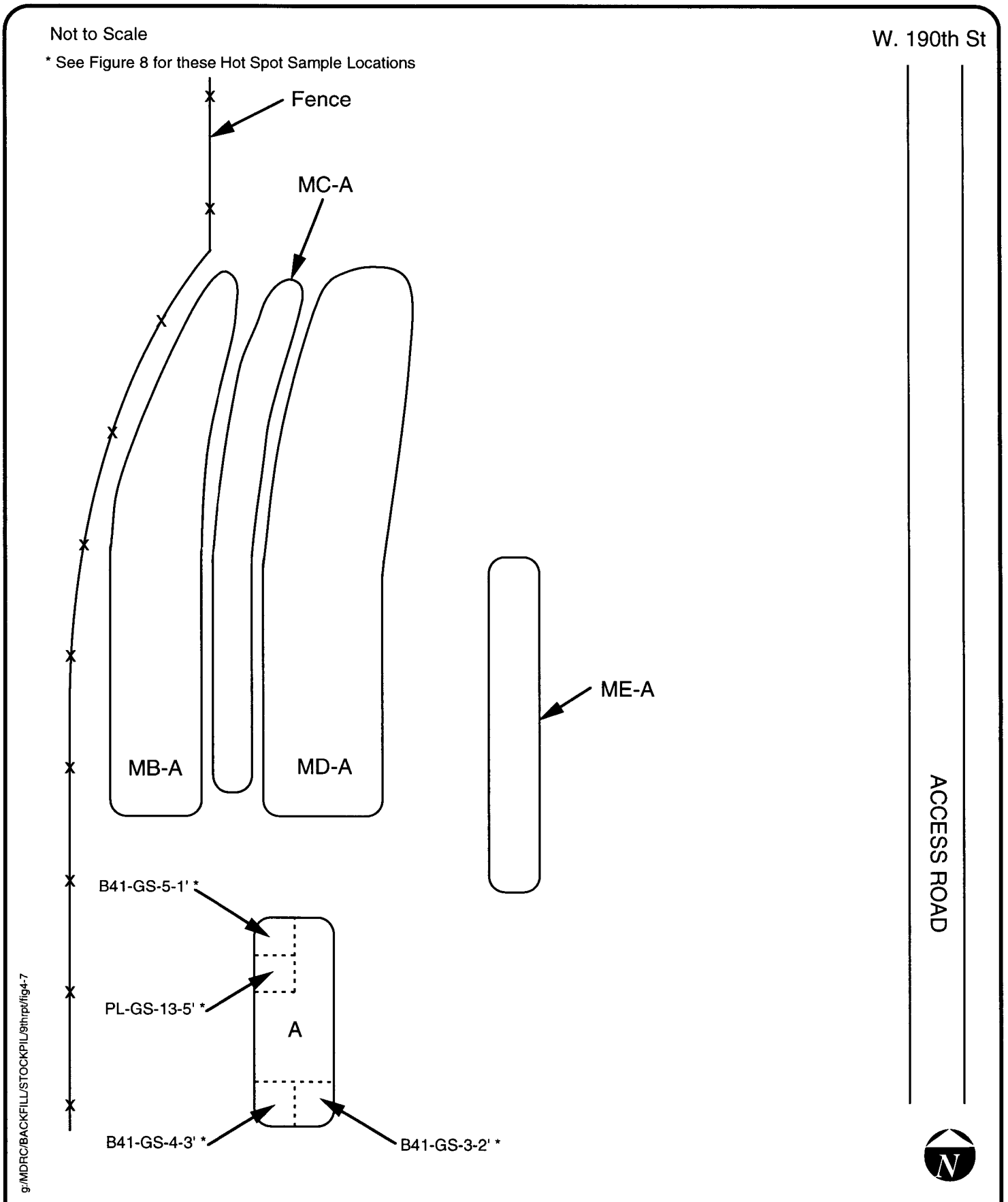
BOEING REALTY CORPORATION
C-6 FACILITY

Remedial Excavations B41-RE-1 and PPL-RE-1 Locations

FIGURE 3

g:/MDRC/BACKFILL/STOCKPIL/9hrpr/tbl389

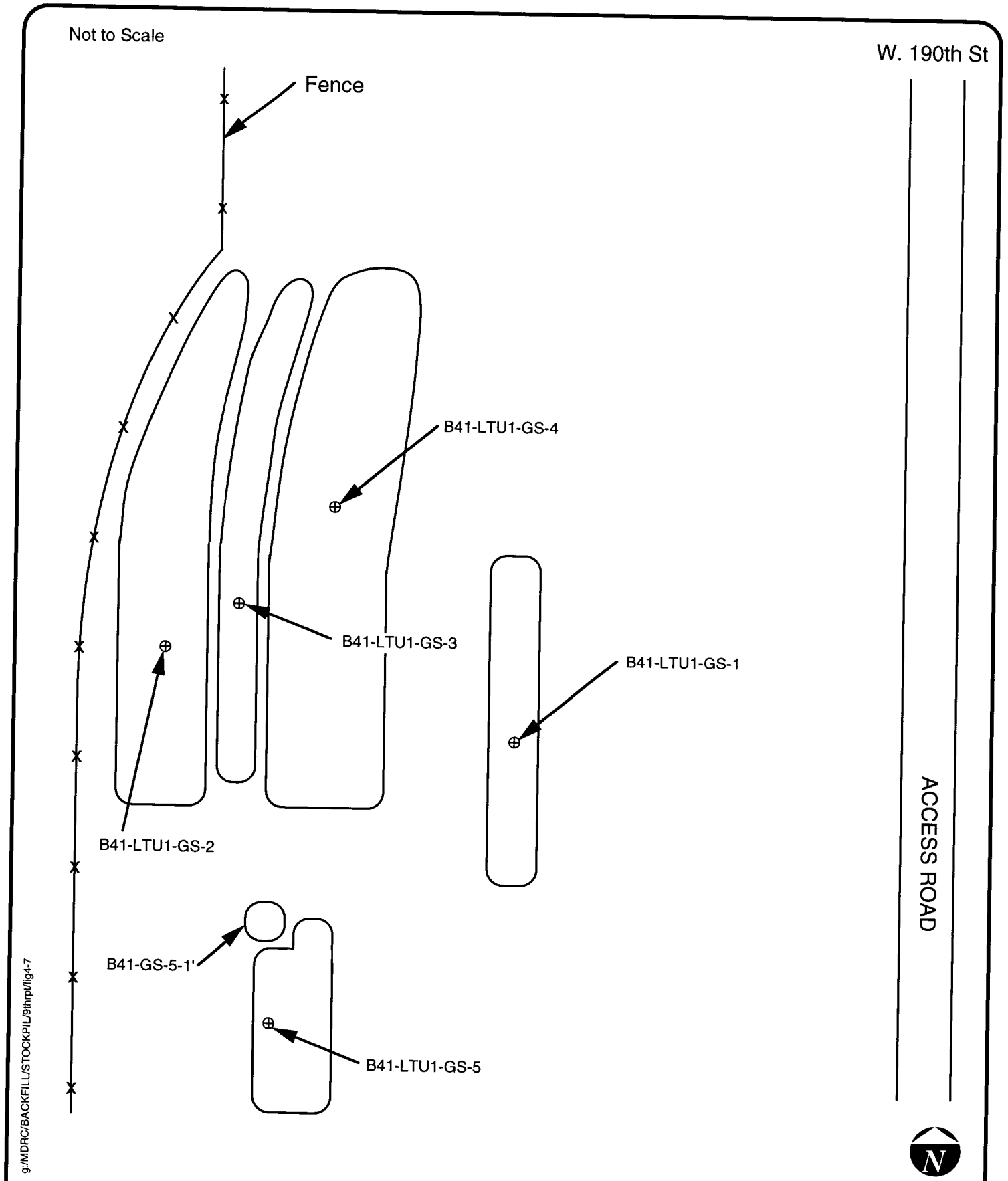
BOE-C6-0034640



BOEING REALTY CORPORATION
C-6 FACILITY

FIGURE 4

Remedial Excavation B41-RE-1 Stockpile Locations

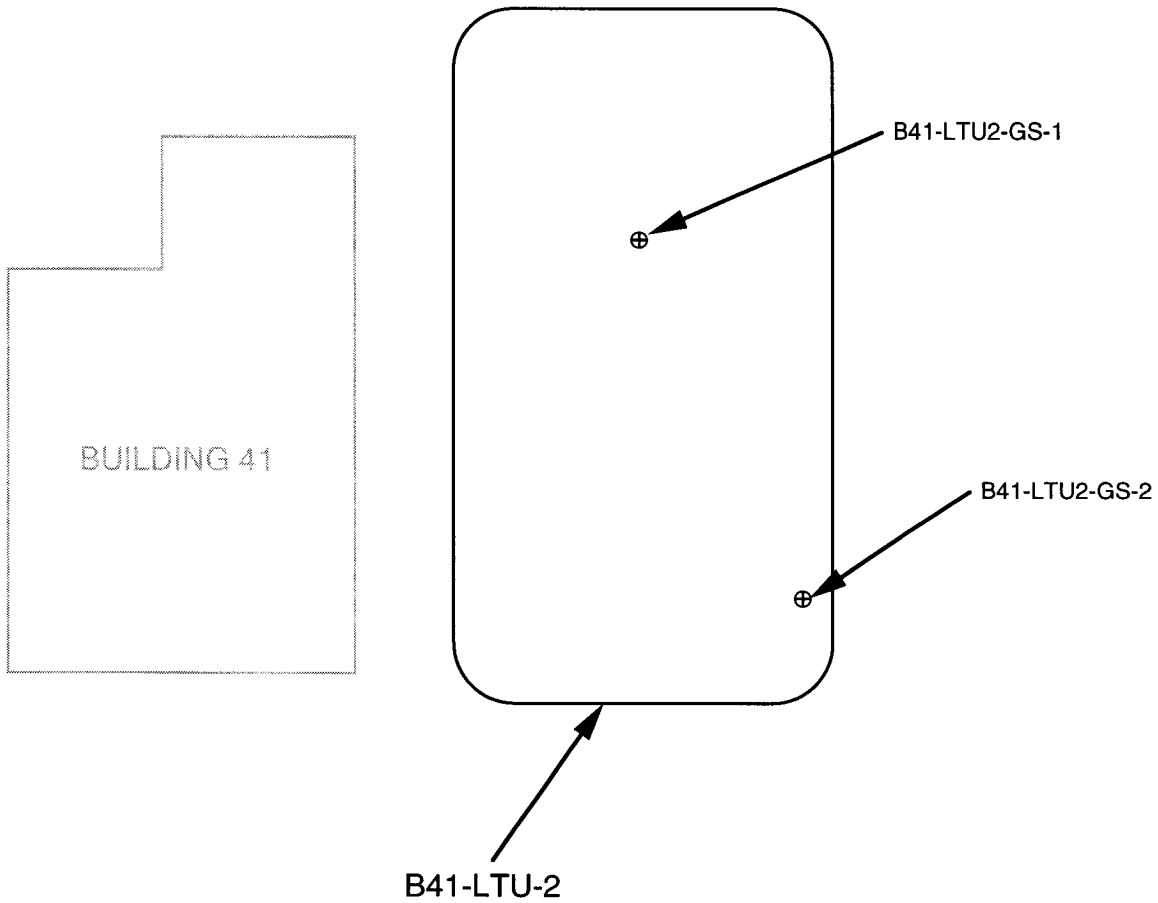


BOEING REALTY CORPORATION
C-6 FACILITY

FIGURE 5

Land Treatment Unit B41-LTU-1 Sample Locations

Not to Scale

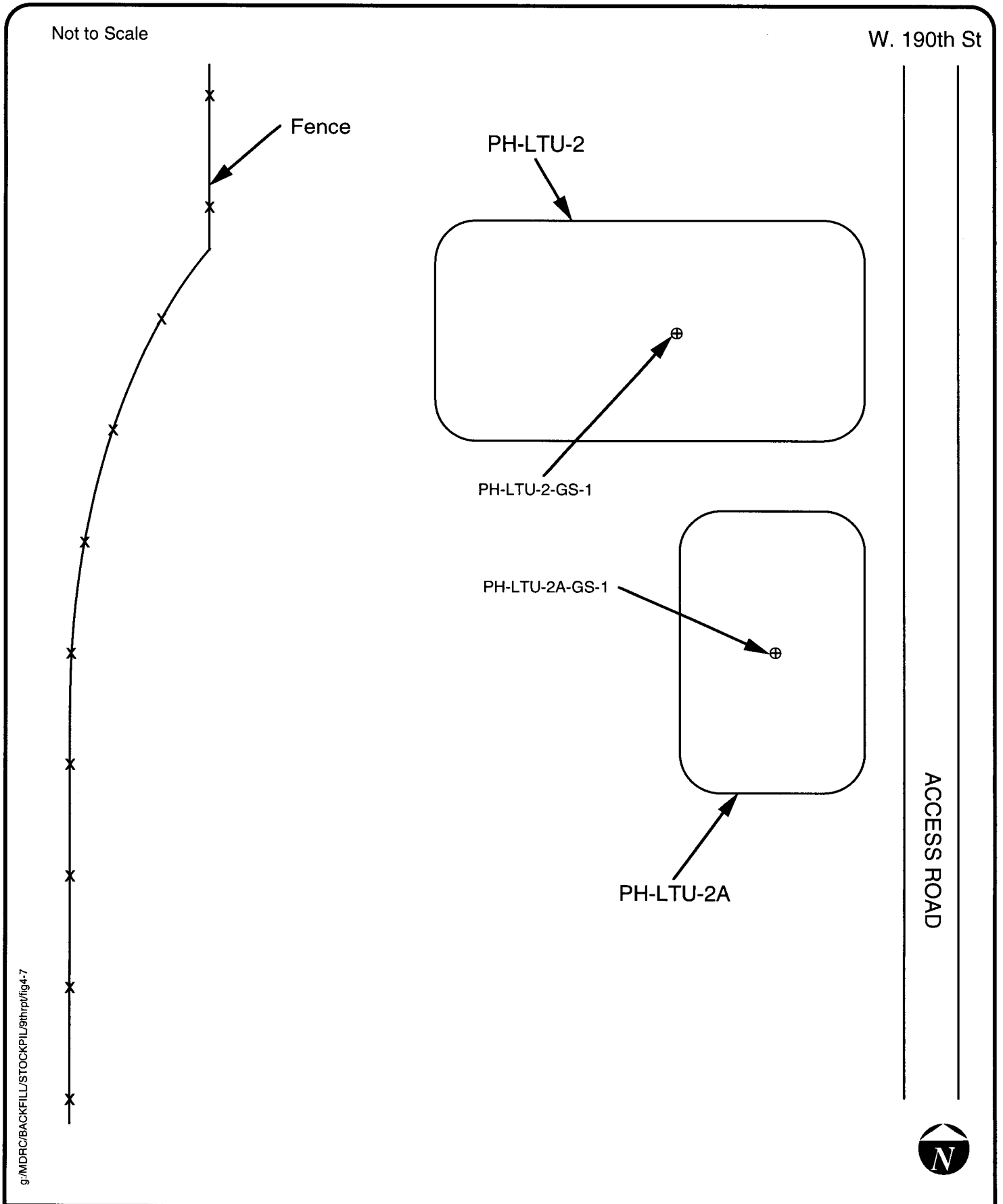


g:/MDRC/BACKFILL/STOCKPIL/9thrpt/fig4-7

BOEING REALTY CORPORATION
C-6 FACILITY

FIGURE 6

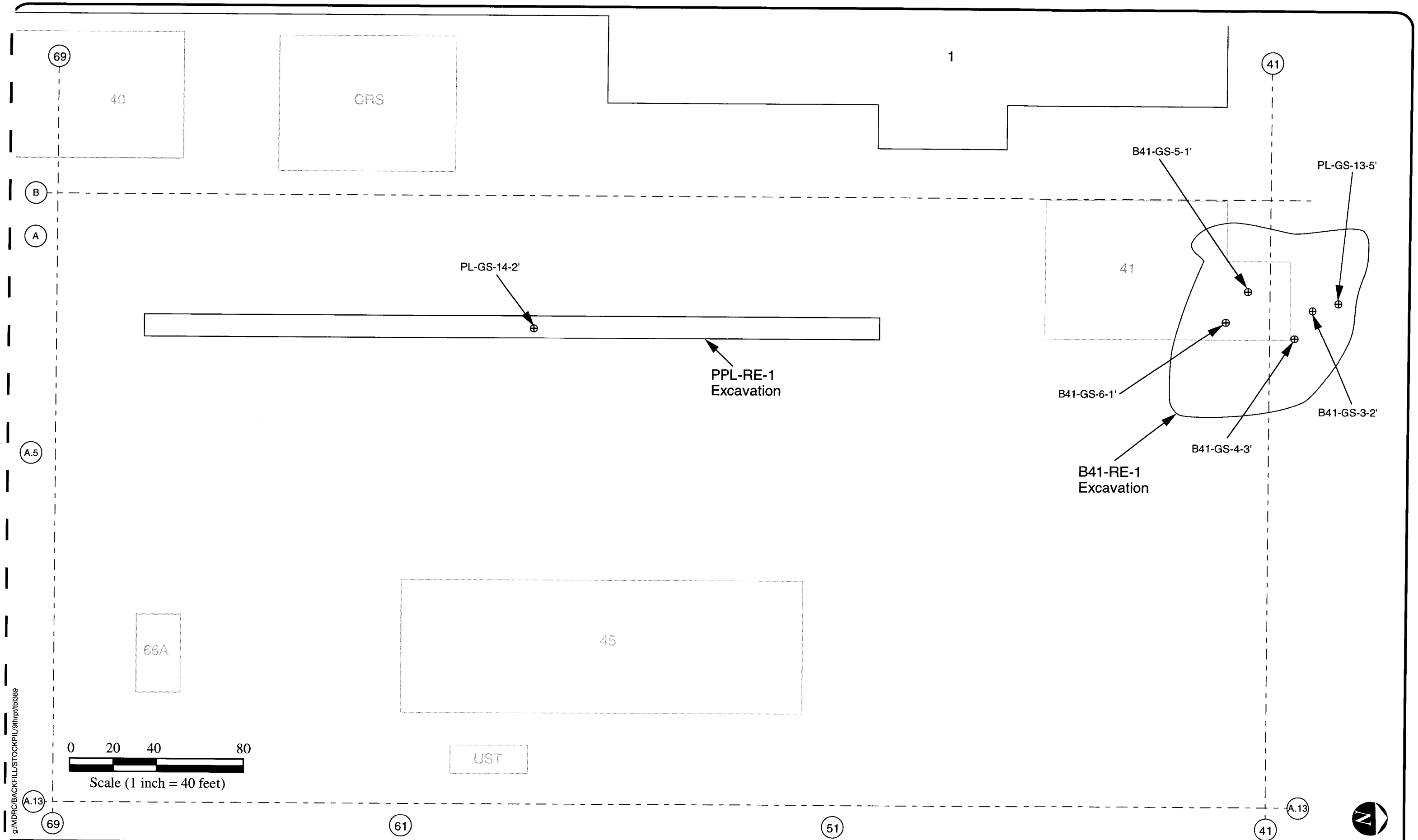
Land Treatment Unit B41-LTU-2 Sample Locations



BOEING REALTY CORPORATION
C-6 FACILITY

FIGURE 7

Land Treatment Units PH-LTU-2 and PH-LTU-2A Sample Locations



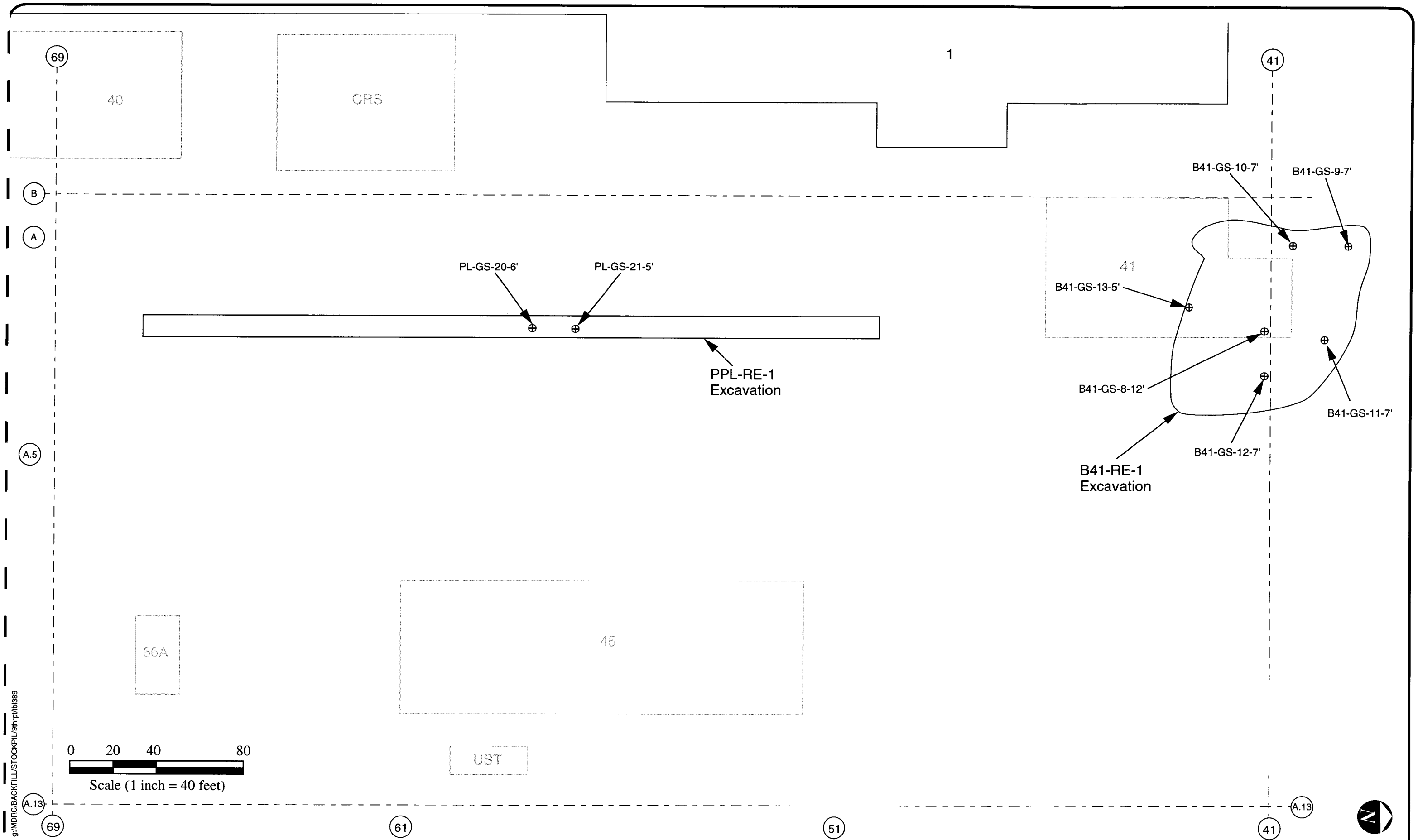
g:/MDRC/BACKFILL/STOCKPIL/9hrpt/bl389

BOEING REALTY CORPORATION
C-6 FACILITY

Excavated Hot Spot Sample Locations

FIGURE 8

BOE-C6-0034645



g:/MDRC/BACKFILL/STOCKPIL/9hrpt/tbl389

BOEING REALTY CORPORATION
C-6 FACILITY

Confirmation Sample Locations

FIGURE 9

FIGURE 10
Soil Screening Evaluation Process - Excavated Soil

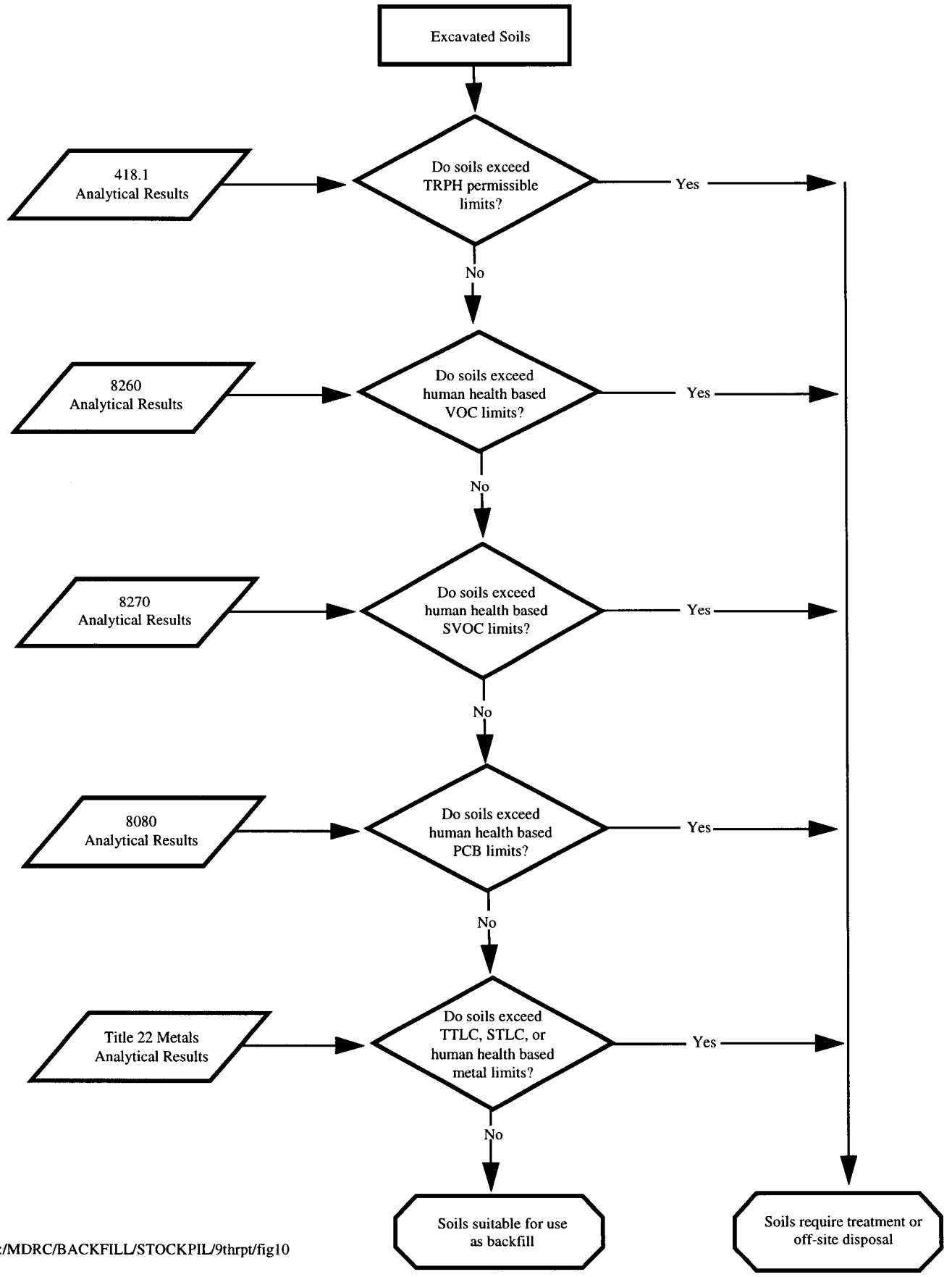


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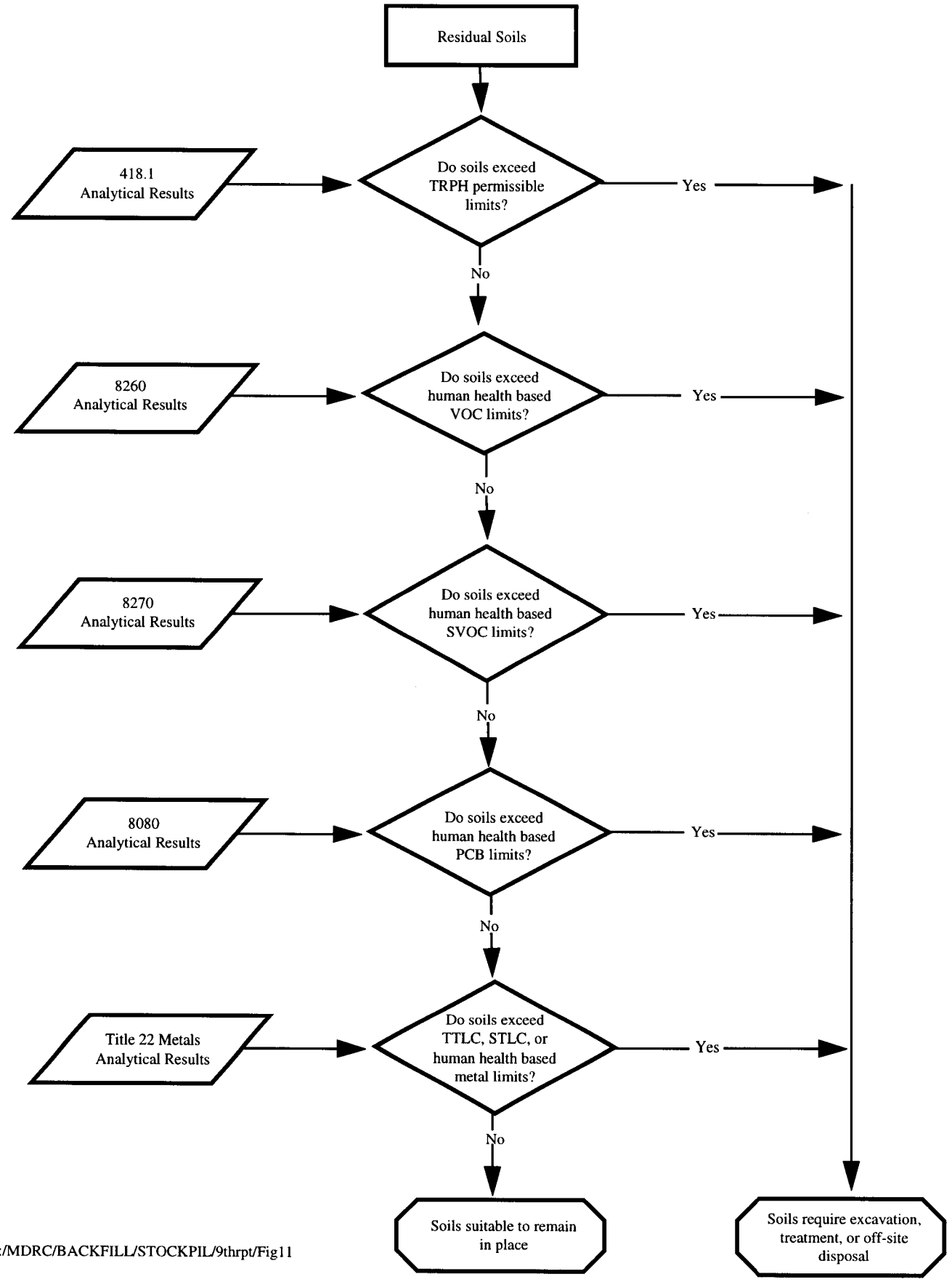
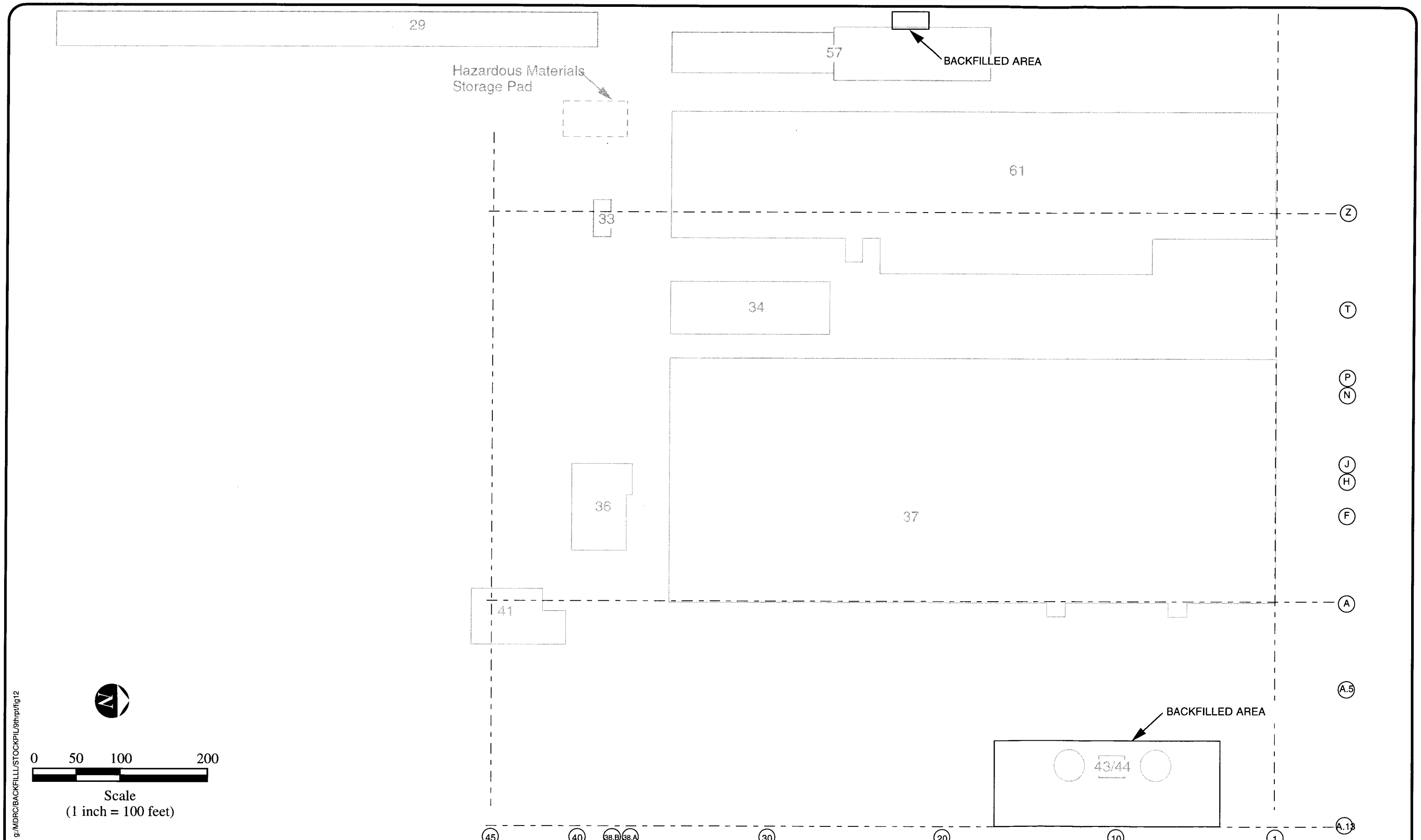
FIGURE 11
Soil Screening Evaluation Process - Residual Soil



g:/MDRC/BACKFILL/STOCKPIL/9thrpt/Fig11



BOEING REALTY CORPORATION
C-6 FACILITY

Soil Backfill Locations

FIGURE 12

Tables

MONTGOMERY WATSON

TABLE 1

Summary of Soil Sample Analytical Methods

Sample Type	EPA Method	Analyte
Hot Spot Sample	418.1	TRPH (a)
	6000/7000	Metals
	8260	VOCs (b)
	8270	SVOCs (b)
	8080	PCBs (b)
	8015M	Fuel Characterization (b)
Land Treatment Unit Sample	6000/7000	Metals (b)
	8260	VOCs
	8270	SVOCs (b)
Confirmation Sample	418.1	TRPH (a) (b)
	6000/7000	Metals
	8260	VOCs (b)
	8270	SVOCs (b)
	8080	PCBs (b)
	8015M	Fuel Characterization (b)

Notes:
TRPH Total Recoverable Petroleum Hydrocarbons
VOCs Volatile Organic Compounds
SVOCs Semi-volatile Organic Compounds.
PCBs Polychlorinated Biphenyls
(a) Samples exhibiting TRPH concentration greater than 10,000 mg/kg were submitted for carbon chain analysis.
(b) Samples were selectively analyzed for these analytes.

TABLE 2
Analytical Data Summary
Remedial Excavation B41-RE-1 Excavated Hot Spot Samples*

		Sample Number and Collection Date						
		B41-GS-3-2' 9/29/97	B41-GS-4-3' 9/29/97	B41-GS-5-1' 9/29/97	B41-GS-6-1' 9/29/97	PL-GS-13-5' 11/7/97		
Analyte	**EPA Method**	**A.1/A.2-40 @ 2' bgs***	**A.2-40.5 @ 3' bgs***	**A.1-41.5 @ 1' bgs***	**A.1/A.2-42 @ 1' bgs***	**A.1/A.2-39.5 @ 5' bgs***	**Regulatory Levels**	
							TTLC (mg/kg)	**STLC (mg/L)**
TRPH (mg/kg)	418.1	1,300.00	760.00	32,000.00	47.00	4,200.00		
TPHd (mg/kg)	8015M	--	--	--	--	2,400.00		
TPHg (mg/kg)	8015M	--	--	--	--	110.00		
Title 22 Metals (mg/kg)								
Antimony	6010	<5.00	<5.00	<5.00	<5.00	<5.00	**500**	**15**
Arsenic	6010	12.00	36.00 #	**350.00** (2)(3) #	**51.00** (4)(5)#	17.00 #	**500**	**5**
Barium	6010	69.00	78.00	93.00	85.00	76.00	**10,000**	**100**
Beryllium	6010	<0.1	<0.10	<0.10	<0.10	<0.10	**75**	**0.75**
Cadmium	6010	<0.1	<0.10	8.90	1.20	<0.10	**100**	**1**
Chromium (VI)	7196	<0.5	<0.50	<0.50	<0.50	<0.50	**500**	**5**
Chromium (total)	6010	21.00	27.00	24.00	18.00	32.00	**2,500**	**5 ****
Cobalt	6010	4.70	6.30	8.00	5.80	6.70	**8,000**	**80**
Copper	6010	16.00	13.00	15.00	8.40	17.00	**2,500**	**25**
Lead (total)	6010	3.60	3.00	7.10	<1.0	20.00	**1,000**	**5**
Mercury	7471	<0.01	<0.01	<0.01	<0.01	<0.01	**20**	**0.2**
Molybdenum	6010	<0.5	2.40	<0.50	<0.50	<0.50	**3,500**	**350**
Nickel	6010	8.80	13.00	14.00	7.10	19.00	**2,000**	**20**
Selenium	6010	<1.0	<1.00	<1.00	<1.00	<1.00	**100**	**1**
Silver	6010	<0.1	<0.10	<0.10	<0.10	<0.10	**500**	**5**
Thallium	6010	<5.0	<5.00	<5.00	<5.00	<5.00	**700**	**7**
Vanadium	6010	24.00	31.00	27.00	24.00	36.00	**2,400**	**24**
Zinc	6010	73.00	40.00	42.00	31.00	51.00	**5,000**	**250**
VOCs (1) (µg/kg)								
1,1-Dichloroethene	8260	7.50	--	<50.00	--	<100.00		
Ethylbenzene	8260	7.20	--	85.00	--	<100.00		
Toluene	8260	2.70	--	<50.00	--	<100.00		
Trichlorofluoromethane	8260	33.00	--	<250.00	--	<200.00		
Total Xylenes	8260	34.00	--	61.00	--	<100.00		
Isopropylbenzene	8260	15.00	--	62.00	--	<100.00		
n-Propylbenzene	8260	24.00	--	150.00	--	450.00		
1,3,5-Trimethylbenzene	8260	65.00	--	120.00	--	150.00		
1,2,4-Trimethylbenzene	8260	170.00	--	380.00	--	650.00		
sec-Butylbenzene	8260	21.00	--	120.00	--	390.00		
p-Isopropyltoluene	8260	<2.50	--	100.00	--	260.00		
n-Butylbenzene	8260	20.00	--	160.00	--	720.00		
Naphthalene	8260	47.00	--	960.00	--	7,800.00		
SVOCs (1) (µg/kg)								
Acenaphthene	8270	<250.00	--	<100.00	--	2,600.00		
Anthracene	8270	<250.00	--	<100.00	--	2,600.00		
Benzo (a) Anthracene	8270	<250.00	--	<100.00	--	3,000.00		
Benzo (b) Fluoranthene	8270	<625.00	--	<250.00	--	2,700.00		
Benzo (k) Fluoranthene	8270	<625.00	--	<250.00	--	2,800.00		
Benzo (a) Pyrene	8270	<625.00	--	<250.00	--	3,800.00 #		
Chrysene	8270	<250.00	--	<100.00	--	3,700.00		
Dibenzofuran	8270	<250.00	--	<100.00		1,200.00		
Fluoranthene	8270	<250.00	--	<100.00	--	6,600.00		
Fluorene	8270	<250.00	--	<100.00	--	2,500.00		
Indeno(1,2,3-cd)Pyrene	8270	<625.00	--	<250.00	--	2,500.00		
2-Methylnaphthalene	8270	<250.00	--	130.00	--	12,000.00		
Naphthalene	8270	<250.00	--	<100.00	--	5,700.00		
Phenanthrene	8270	<250.00	--	<100.00	--	4,700.00		
Pyrene	8270	<250.00	--	<100.00	--	6,300.00		
Carbon Chain Range (mg/kg)								
Up to and including C12	8015m	--	--	600.00	--	300.00		
C13-C22	8015m	--	--	3,800.00	--	2,900.00		
C23 and higher	8015m	--	--	160.00	--	3,100.00		
PCBs (µg/kg)	8080	--	--	ND	--	ND		

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/L = milligrams per liter
-- = not analyzed
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated biphenyls
ND = not detected
bgs = below ground surface
# = Exceeds Sceening Value

SVOCs = Semi-volatile Organic Compounds
TRPH = Total Recoverable Petroleum Hydrocarbons
TPHd = Total Petroleum Hydrocarbons as diesel
TPHg = Total Petroleum Hydrocarbons as gasoline
TTLC = California Total Threshold Limit Concentration
STLC = California Soluble Threshold Limit Concentration
(1) VOCs and SVOCs not listed were not detected
(2) Waste Extraction Test performed on this sample. Result was 51 mg/L.
(3) TCLP analysis performed on this sample. Result was 4.0 mg/L.
(4) Waste Extraction Test performed on this sample. Result was 3.4 mg/L.
(5) TCLP analysis performed on this sample. Result was <1.0 mg/L.

* Refer to Figure 8 for sample locations
** STLC is 560 mg/L when TCLP is performed and result is less than 5 mg/L per CCR Title 22.
NOTE: Site-Specific Health-Based Soil Screening Values Presented in Table 8 are Reported in mg/kg

g:/MDRC/BACKFILL/STOCKPIL/9thrpt/Tbl2-7

TABLE 3
Analytical Data Summary
Land Treatment Units B41-LTU-1 and B41-LTU-2 Samples*

		Sample Number and Collection Date						
		From B41-LTU-1			From B41-LTU-2			
Analyte	**EPA Method**	**B41-LTU1-GS-1 12/29/97**	**B41-LTU1-COMP 12/31/97**	**B41-LTU1-GS-4 12/31/97**	**B41-LTU2-GS-1 12/31/97**	**B41-LTU2-GS-2 12/31/97**	**Regulatory Levels TTLC (mg/kg)**	**STLC (mg/L)**
TRPH (mg/kg)	418.1	- -	- -	- -	- -	- -		
Title 22 Metals (mg/kg)								
Antimony	6010	<5.00	<5.00	<5.00	<5.00	<5.00	**500**	**15**
Arsenic	6010	7.90	8.90	6.50	5.00	4.50	**500**	**5**
Barium	6010	91.00	78.00	81.00	78.00	82.00	**10,000**	**100**
Beryllium	6010	<0.10	<0.10	<0.10	<0.10	<0.10	**75**	**0.75**
Cadmium	6010	0.90	1.10	0.83	0.87	1.10	**100**	**1**
Chromium (VI)	7196	<0.50	<0.50	<0.50	<0.50	<0.50	**500**	**5**
Chromium (total)	6010	12.00	12.00	12.00	13.00	19.00	**2,500**	**5 ******
Cobalt	6010	6.80	6.10	6.70	6.00	6.00	**8,000**	**80**
Copper	6010	15.00	14.00	15.00	13.00	22.00	**2,500**	**25**
Lead (total)	6010	3.50	3.80	3.50	4.80	19.00	**1,000**	**5**
Mercury	7471	<0.01	<0.01	<0.01	<0.01	<0.01	**20**	**0.2**
Molybdenum	6010	<0.50	<0.50	<0.50	<0.50	<0.50	**3,500**	**350**
Nickel	6010	9.50	8.60	8.90	8.10	8.70	**2,000**	**20**
Selenium	6010	<1.00	<1.00	<1.00	<1.00	<1.00	**100**	**1**
Silver	6010	<0.10	<0.10	<0.10	<0.10	<0.10	**500**	**5**
Thallium	6010	<5.00	<5.00	<5.00	<5.00	<5.00	**700**	**7**
Vanadium	6010	24.00	22.00	23.00	21.00	20.00	**2,400**	**24**
Zinc	6010	30.00	31.00	28.00	35.00	120.00	**5,000**	**250**
VOCs (µg/kg)	8260	ND	ND	ND	ND	ND		
SVOCs (1) (µg/kg)								
Benzo (a) Anthracene	8270	<100.00	<100.00	230.00	<100.00	430.00		
Benzo (b) Fluoranthene	8270	<250.00	<250.00	<500.00	<250.00	640.00		
Benzo (k) Fluoranthene	8270	<250.00	<250.00	<500.00	<250.00	530.00		
Benzo (g,h,i) Perylene	8270	<250.00	<250.00	<500.00	<250.00	1,000.00		
Benzo (a) Pyrene	8270	<250.00	<250.00	<500.00	<250.00	540.00		
Chrysene	8270	<100.00	120.00	230.00	100.00	810.00		
Fluoranthene	8270	<100.00	150.00	350.00	110.00	620.00		
Indeno (1,2,3-cd) Pyrene	8270	<250.00	<250.00	<500.00	<250.00	670.00		
Phenanthrene	8270	<100.00	<100.00	<200.00	<100.00	190.00		
Pyrene	8270	130.00	160.00	390.00	130.00	690.00		
Carbon Chain Range (mg/kg)	8015m	- -	- -	- -	- -	- -		
PCBs (µg/kg)	8080	- -	- -	- -	- -	- -		

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/L = milligrams per liter
-- = not analyzed

ND = not detected
PCBs = Polychlorinated biphenyls
VOCs = Volatile Organic Compounds
SVOCs = Semi-volatile Organic Compounds

TRPH = Total Recoverable Petroleum Hydrocarbons
TTLC = California Total Threshold Limit Concentration
STLC = California Soluble Threshold Limit Concentration
(1) SVOCs not listed were not detected

* Refer to Figure 5 and Figure 6 for sample locations; B41-LTU1-COMP is composite of samples B41-LTU1-2, -3, and -5.
** STLC is 560 mg/L when TCLP is performed and result is less than 5 mg/L per CCR Title 22.

NOTE: Site-Specific Health-Based Soil Screening Values Presented in Table 8 are Reported in mg/kg

TABLE 4
Analytical Data Summary
Remedial Excavation PPL-RE-1 Excavated Hot Spot Sample

Analyte	EPA Method	Sample Number, Collection Date, Grid Location and Depth PL-GS-14-2' 11/7/97 A.2-58 @ 2' bgs*	Regulatory Levels TTLC (mg/kg)	Regulatory Levels STLC (mg/L)
TRPH (mg/kg)	418.1	4,600.00		
TPHd (mg/kg)	8015M	10,000.00		
TPHg (mg/kg)	8015M	280.00		
Title 22 Metals (mg/kg)				
Antimony	6010	<5.00	500	15
Arsenic	6010	<1.00	500	5
Barium	6010	140.00	10,000	100
Beryllium	6010	<0.10	75	0.75
Cadmium	6010	<0.10	100	1
Chromium (VI)	7196	<0.50	500	5
Chromium (total)	6010	39.00	2,500	5 **
Cobalt	6010	10.00	8,000	80
Copper	6010	15.00	2,500	25
Lead (total)	6010	<1.00	1,000	5
Mercury	7471	<0.01	20	0.2
Molybdenum	6010	<0.50	3,500	350
Nickel	6010	15.00	2,000	20
Selenium	6010	<1.00	100	1
Silver	6010	<0.10	500	5
Thallium	6010	<5.00	700	7
Vanadium	6010	41.00	2,400	24
Zinc	6010	48.00	5,000	250
VOCs (1) (µg/kg)				
n-Propylbenzene	8260	100.00		
1,3,5-Trimethylbenzene	8260	68.00		
1,2,4-Trimethylbenzene	8260	570.00		
n-Butylbenzene	8260	250.00		
Naphthalene	8260	4,600.00		
SVOCs (1) (µg/kg)				
Acenaphthene	8270	4,400.00		
Anthracene	8270	4,200.00		
Benzo (a) Anthracene	8270	4,300.00		
Benzo (a) Pyrene	8270	4,000.00 #		
Chrysene	8270	5,100.00		
Fluoranthene	8270	3,700.00		
2-Methylnaphthalene	8270	29,000.00		
Naphthalene	8270	7,900.00		
Phenanthrene	8270	24,000.00		
Pyrene	8270	14,000.00		
Carbon Chain Range (mg/kg)				
Up to and including C12	8015m	770.00		
C13-C22	8015m	9,200.00		
C23 and higher	8015m	2,300.00		
PCBs (µg/kg)	8080	ND		

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/L = milligrams per liter
-- = not analyzed
ND = not detected
bgs = below ground surface
# = Exceeds Sceening Value
PCBs = Polychlorinated biphenyls

VOCs = Volatile Organic Compounds
SVOCs = Semi-volatile Organic Compounds
TRPH = Total Recoverable Petroleum Hydrocarbons
TPHd = Total Petroleum Hydrocarbons as diesel
TPHg = Total Petroleum Hydrocarbons as gasoline
TTLC = California Total Threshold Limit Concentration
STLC = California Soluble Threshold Limit Concentration
(1) VOCs and SVOCs not listed were not detected

* Refer to Figure 8 for sample location
** STLC is 560 mg/L when TCLP is performed and result is less than 5 mg/L per CCR Title 22.
NOTE: Site-Specific Health-Based Soil Screening Values Presented in Table 8 are Reported in mg/kg

TABLE 5
Analytical Data Summary
Land Treatment Units PH-LTU-2 and PH-LTU-2A Samples*

Analyte	EPA Method	Sample Number and Collection Date: From PH-LTU-2 PH-LTU-2-GS-1 12/29/97	Sample Number and Collection Date: From PH-LTU-2A PH-LTU-2A-GS-1 12/29/97	Regulatory Levels: TTLC (mg/kg)	Regulatory Levels: STLC (mg/L)
TRPH (mg/kg)	418.1	--	--		
Title 22 Metals (mg/kg)					
Antimony	6010	<5.00	<5.00	500	15
Arsenic	6010	3.50	14.00	500	5
Barium	6010	23.00	79.00	10,000	100
Beryllium	6010	<0.10	<0.10	75	0.75
Cadmium	6010	1.30	1.20	100	1
Chromium (VI)	7196	<0.50	<0.50	500	5
Chromium (total)	6010	15.00	15.00	2,500	5 **
Cobalt	6010	8.30	7.00	8,000	80
Copper	6010	18.00	14.00	2,500	25
Lead (total)	6010	2.10	4.40	1,000	5
Mercury	7471	<0.01	<0.01	20	0.2
Molybdenum	6010	<0.50	<0.50	3,500	350
Nickel	6010	14.00	9.90	2,000	20
Selenium	6010	<1.00	<1.00	100	1
Silver	6010	<0.10	<0.10	500	5
Thallium	6010	<5.00	<5.00	700	7
Vanadium	6010	17.00	27.00	2,400	24
Zinc	6010	27.00	34.00	5,000	250
VOCs (µg/kg)	8260	ND	ND		
SVOCs (1) (µg/kg)					
Benzo(a)anthracene	8270	<100.00	130.00		
Chrysene	8270	<100.00	210.00		
Fluoranthene	8270	<100.00	130.00		
Pyrene	8270	<100.00	410.00		
Carbon Chain Range (mg/kg)	8015m	--	--		
PCBs (µg/kg)	8080	--	--		

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/L = milligrams per liter
-- = not analyzed
ND = not detected
PCBs = Polychlorinated biphenyls

VOCs = Volatile Organic Compounds
SVOCs = Semi-volatile Organic Compounds
TRPH = Total Recoverable Petroleum Hydrocarbons
TTLC = California Total Threshold Limit Concentration
STLC = California Soluble Threshold Limit Concentration
(1) SVOCs not listed were not detected

* Refer to Figure 7 for sample locations
** STLC is 560 mg/L when TCLP is performed and result is less than 5 mg/L per CCR Title 22.

NOTE: Site-Specific Health-Based Soil Screening Values Presented in Table 8 are Reported in mg/kg

TABLE 6
Analytical Data Summary
Remedial Excavation B41-RE-1 Confirmation Samples
Page 1 of 2

Analyte	EPA Method	Sample Number, Collection Date, Grid Location and Depth			Regulatory Levels	
		B41-GS-8-12' 11/25/97 A.2-41 @ 12' bgs*	B41-GS-9-7' 12/5/97 A-39 @ 7' bgs*	B41-GS-10-7' 12/5/97 A-40.5 @ 7' bgs*	TTLC (mg/kg)	STLC (mg/L)
TRPH (mg/kg)	418.1	11,000.00	360.00	15.00		
Title 22 Metals (mg/kg)						
Antimony	6010	<5.00	<5.00	<5.00	500	15
Arsenic	6010	2.30	5.50	<1.00	500	5
Barium	6010	150.00	100.00	72.00	10,000	100
Beryllium	6010	<0.10	<0.10	<0.10	75	0.75
Cadmium	6010	<0.10	<0.10	<0.10	100	1
Chromium (VI)	7196	<0.50	<0.50	<0.50	500	5
Chromium (total)	6010	22.00	11.00	13.00	2,500	5 **
Cobalt	6010	13.00	6.80	6.60	8,000	80
Copper	6010	27.00	20.00	13.00	2,500	25
Lead (total)	6010	14.00	2.90	2.30	1,000	5
Mercury	7471	<0.01	<0.01	<0.01	20	0.2
Molybdenum	6010	<0.50	<0.50	<0.50	3,500	350
Nickel	6010	19.00	8.10	8.60	2,000	20
Selenium	6010	<1.00	<1.00	<1.00	100	1
Silver	6010	<0.10	<0.10	<0.10	500	5
Thallium	6010	<5.00	<5.00	<5.00	700	7
Vanadium	6010	39.00	26.00	28.00	2,400	24
Zinc	6010	93.00	34.00	32.00	5,000	250
VOCs (1) (µg/kg)						
1,1-Dichloroethene	8260	<50.00	<5.00	4.10		
Ethylbenzene	8260	380.00	<5.00	<2.50		
Total Xylenes	8260	330.00	<5.00	<2.50		
cis-1,2-Dichloroethene	8260	<50.00	<5.00	<2.50		
Isopropylbenzene	8260	350.00	<5.00	<2.50		
n-Propylbenzene	8260	740.00	<5.00	<2.50		
1,3,5-Trimethylbenzene	8260	<50.00	9.50	<2.50		
1,2,4-Trimethylbenze	8260	260.00	<5.00	<2.50		
sec-Butylbenzene	8260	760.00	7.20	<2.50		
p-Isopropyltoluene	8260	<50.00	13.00	<2.50		
n-Butylbenzene	8260	910.00	7.60	<2.50		
Naphthalene	8260	2,300.00	<5.00	<2.50		
SVOCs (1) (µg/kg)						
Dibenzofuran	8270	1,100.00	<250.00	<100.00		
Fluorene	8270	3,200.00	320.00	<100.00		
2-Methylnaphthalene	8270	19,000.00	1,130.00	<100.00		
Naphthalene	8270	8,900.00	300.00	<100.00		
Phenanthrene	8270	4,500.00	620.00	<100.00		
Pyrene	8270	1,300.00	<250.00	<100.00		
Carbon Chain Range (mg/kg)						
Up to and including C12	8015m	3,100.00	--	--		
C13-C22	8015m	20,000.00 #	--	--		
C23 and higher	8015m	<0.10	--	--		
PCBs (µg/kg)	8080	ND	--	--		

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/L = milligrams per liter
bgs = below ground surface
# = Exceeds Sceening Value

ND = not detected
-- = not analyzed
TRPH = Total Recoverable Petroleum Hydrocarbons
(1) VOCs and SVOCs not listed were not detected

PCBs = Polychlorinated biphenyls
VOCs = Volatile Organic Compounds
SVOCs = Semi-volatile Organic Compounds

* Refer to Figure 9 for sample locations
** STLC is 560 mg/L when TCLP is performed and result is less than 5 mg/L per CCR Title 22.
NOTE: Site-Specific Health-Based Soil Screening Values Presented in Table 8 are Reported in mg/kg

g:/MDRC/BACKFILL/STOCKPIL/9thrpt/Tbl2-7

TABLE 6
Analytical Data Summary
Remedial Excavation B41-RE-1 Confirmation Samples
Page 2 of 2

Analyte	EPA Method	Sample Number, Collection Date, Grid Location and Depth			Regulatory Levels	
		B41-GS-11-7' 12/5/97 A.2/A.3-40 @ 7' bgs*	B41-GS-12-7' 12/5/97 A.3-41 @ 7' bgs*	B41-GS-13-5' 12/11/97 A.1/A.2-43 @ 5' bgs*	TTLC (mg/kg)	STLC (mg/L)
TRPH (mg/kg)	418.1	<8.00	<8.00	14.00		
Title 22 Metals (mg/kg)						
Antimony	6010	<5.00	<5.00	<5.00	500	15
Arsenic	6010	<1.00	<1.00	<1.00	500	5
Barium	6010	84.00	170.00	86.00	10,000	100
Beryllium	6010	<0.10	<0.10	<0.10	75	0.75
Cadmium	6010	<0.10	<0.10	<0.10	100	1
Chromium (VI)	7196	<0.50	<0.50	<0.50	500	5
Chromium (total)	6010	13.00	15.00	15.00	2,500	5 **
Cobalt	6010	6.80	7.50	6.30	8,000	80
Copper	6010	13.00	20.00	11.00	2,500	25
Lead (total)	6010	2.10	3.20	2.00	1,000	5
Mercury	7471	<0.01	<0.01	<0.01	20	0.2
Molybdenum	6010	<0.50	<0.50	<0.50	3,500	350
Nickel	6010	7.40	11.00	8.80	2,000	20
Selenium	6010	<1.00	<1.00	<1.00	100	1
Silver	6010	<0.10	<0.10	<0.10	500	5
Thallium	6010	<5.00	<5.00	<5.00	700	7
Vanadium	6010	26.00	27.00	26.00	2,400	24
Zinc	6010	33.00	41.00	30.00	5,000	250
VOCs (1) (µg/kg)						
1,1-Dichloroethene	8260	<2.50	<2.50	<2.50		
Ethylbenzene	8260	<2.50	<2.50	<2.50		
Total Xylenes	8260	<2.50	<2.50	<2.50		
cis-1,2-Dichloroethene	8260	<2.50	7.10	<2.50		
Isopropylbenzene	8260	<2.50	<2.50	<2.50		
n-Propylbenzene	8260	<2.50	<2.50	<2.50		
1,3,5-Trimethylbenzene	8260	<2.50	<2.50	<2.50		
1,2,4-Trimethylbenze	8260	<2.50	<2.50	<2.50		
sec-Butylbenzene	8260	<2.50	<2.50	<2.50		
p-Isopropyltoluene	8260	<2.50	<2.50	<2.50		
n-Butylbenzene	8260	<2.50	<2.50	<2.50		
Naphthalene	8260	<2.50	<2.50	<2.50		
SVOCs (1) (µg/kg)						
Dibenzofuran	8270	<100.00	<100.00	<100.00		
Fluorene	8270	<100.00	<100.00	<100.00		
2-Methylnaphthalene	8270	<100.00	<100.00	<100.00		
Naphthalene	8270	<100.00	<100.00	<100.00		
Phenanthrene	8270	<100.00	<100.00	<100.00		
Pyrene	8270	<100.00	<100.00	<100.00		
Carbon Chain Range (mg/kg)						
Up to and including C12	8015m	--	--	--		
C13-C22	8015m	--	--	--		
C23 and higher	8015m	--	--	--		
PCBs (µg/kg)	8080	--	--	--		

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/L = milligrams per liter
bgs = below ground surface
# = Exceeds Sceening Value

ND = not detected
-- = not analyzed
TRPH = Total Recoverable Petroleum Hydrocarbons
(1) VOCs and SVOCs not listed were not detected

PCBs = Polychlorinated biphenyls
VOCs = Volatile Organic Compounds
SVOCs = Semi-volatile Organic Compounds

* Refer to Figure 9 for sample locations
** STLC is 560 mg/L when TCLP is performed and result is less than 5 mg/L per CCR Title 22.
NOTE: Site-Specific Health-Based Soil Screening Values Presented in Table 8 are Reported in mg/kg

g:/MDRC/BACKFILL/STOCKPIL/9thrpt/Tbl2-7

TABLE 7
Analytical Data Summary
Remedial Excavation PPL-RE-1 Confirmation Samples

Analyte	EPA Method	Sample Number, Collection Date, Grid Location and Depth		Regulatory Levels	
		PL-GS-20-6' 12/17/97 A.2-58 @ 6' bgs*	PL-GS-21-5' 12/17/97 A.2-57 @ 5' bgs*	TTLC (mg/kg)	STLC (mg/L)
TRPH (mg/kg)	418.1	--	--		
Title 22 Metals (mg/kg)					
Antimony	6010	--	<5.00	500	15
Arsenic	6010	--	4.30	500	5
Barium	6010	--	77.00	10,000	100
Beryllium	6010	--	<0.10	75	0.75
Cadmium	6010	--	0.26	100	1
Chromium (VI)	7196	--	<0.50	500	5
Chromium (total)	6010	--	15.00	2,500	5 **
Cobalt	6010	--	7.10	8,000	80
Copper	6010	--	13.00	2,500	25
Lead (total)	6010	--	3.10	1,000	5
Mercury	7471	--	<0.01	20	0.2
Molybdenum	6010	--	<0.50	3,500	350
Nickel	6010	--	10.00	2,000	20
Selenium	6010	--	<1.00	100	1
Silver	6010	--	<0.10	500	5
Thallium	6010	--	<5.00	700	7
Vanadium	6010	--	27.00	2,400	24
Zinc	6010	--	29.00	5,000	250
VOCs (µg/kg)	8260	--	--		
SVOCs (µg/kg)	8270	ND	ND		
Carbon Chain Range (mg/kg)	8015m	--	--		
PCBs (µg/kg)	8080	--	--		

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/L = milligrams per liter
-- = not analyzed
ND = not detected
bgs = below ground surface

PCBs = Polychlorinated biphenyls
VOCs = Volatile Organic Compounds
SVOCs = Semi-volatile Organic Compounds
TRPH = Total Recoverable Petroleum Hydrocarbons
TTLC = California Total Threshold Limit Concentration
STLC = California Soluble Threshold Limit Concentration

* Refer to Figure 9 for sample locations
** STLC is 560 mg/L when TCLP is performed and result is less than 5 mg/L per CCR Title 22.

NOTE: Site-Specific Health-Based Soil Screening Values Presented in Table 8 are Reported in mg/kg

TABLE 8
Site-Specific Health-Based Soil Screening Values for Organic Constituents Soil Exposure Pathways (mg/kg)

Constituent	Construction Worker Initial Value	Commercial/ Industrial User Initial Value	Final Value
1-butanol	1.98E+04	3.46E+04	1.98E+04
1,1-dichloroethane	2.23E+03	1.10E+03	1.10E+03
1,1-dichloroethene	1.57E+01	4.21E+00	4.21E+00
1,1,1,2-tetrachloroethane	4.98E+02	1.44E+04	4.98E+02
1,1,2-trichloroethane	2.23E+02	1.26E+03	2.23E+02
1,1,2,2-tetrachloroethane	6.25E+01	1.50E+03	6.25E+01
1,2-dibromo-3-chloropropane	2.42E+00	7.47E+01	2.42E+00
1,2-dibromoethane	4.86E+00	1.84E+02	4.86E+00
1,2-dichlorobenzene	NA	2.64E+06	2.64E+06
1,2-dichloroethane	2.06E+02	2.66E+02	2.06E+02
1,2-dichloropropane	3.37E+01	7.25E+00	7.25E+00
1,2-diphenylhydrazine	2.03E+01	2.36E+08	2.03E+01
1,2,3-trichloropropane	2.39E+00	4.08E+01	2.39E+00
1,2,4-trichlorobenzene	1.74E+02	4.74E+07	1.74E+02
1,3-dichloropropene	4.83E+01	6.63E+02	4.83E+01
1,4-dichlorobenzene	4.32E+02	4.37E+04	4.32E+02
2-butanone	3.28E+04	2.35E+06	3.28E+04
2-chlorophenol	8.57E+02	1.17E+06	8.57E+02
2-methylphenol	8.66E+03	7.59E+07	8.66E+03
2-naphthylamine	9.81E+00	1.63E+06	9.81E+00
2,4-dichlorophenol	5.21E+01	2.22E+07	5.21E+01
2,4-dimethylphenol	3.48E+03	4.37E+08	3.48E+03
2,4-dinitrophenol	3.49E+01	7.14E+09	3.49E+01
2,4-dinitrotoluene	3.48E+01	7.62E+06	3.48E+01
2,4,5-trichlorophenol	1.73E+04	2.21E+08	1.73E+04
2,4,6-trichlorophenol	2.52E+02	1.10E+07	2.52E+02
2,6-dinitrotoluene	2.59E+01	4.51E+05	2.59E+01
3,3-dichlorobenzidine	1.47E+01	7.53E+08	1.47E+01
4-chloroaniline	6.93E+01	6.50E+06	6.93E+01
4-methyl-2-pentanone	1.20E+04	6.84E+05	1.20E+04
4-methylphenol	8.69E+01	4.01E+07	8.69E+01
4,4-ddd	1.03E+02	9.97E+08	1.03E+02
4,4-dde	7.28E+01	2.83E+06	7.28E+01
4,4-ddt	1.22E+01	2.26E+08	1.22E+01
acenaphthene	8.10E+03	1.62E+08	8.10E+03
acetone	1.55E+04	4.37E+05	1.55E+04
acrolein	NA	8.05E+01	8.05E+01
acrylonitrile	1.59E+01	7.65E+01	1.59E+01

TABLE 8
Site-Specific Health-Based Soil Screening Values for
Organic Constituents Soil Exposure Pathways (mg/kg)

Constituent	Construction Worker Initial Value	Commercial/ Industrial User Initial Value	Final Value
aldrin	7.32E-01	2.82E+04	7.32E-01
alpha-bhc	3.93E+00	2.32E+05	3.93E+00
aniline	3.10E+03	1.02E+07	3.10E+03
anthracene	4.06E+03	1.37E+10	4.06E+03
aroclor 1016	NA	7.35E+05	7.35E+05
aroclor 1254	8.70E-01	5.69E+05	8.70E-01
benzene	1.43E+02	1.71E+02	1.43E+02
benzidine	3.52E-02	1.55E+02	3.52E-02
benzoic acid	6.96E+04	6.58E+10	6.96E+04
benzo(a)anthracene	1.14E+01	1.13E+09	1.14E+01
benzo(a)pyrene	1.14E+00	9.56E+07	1.14E+00
benzo(b)fluoranthene	1.14E+01	3.19E+08	1.14E+01
benzo(k)fluoranthene	1.14E+01	9.56E+07	1.14E+01
benzyl alcohol	1.73E+04	3.81E+08	1.73E+04
benzyl chloride	1.00E+02	4.03E+03	1.00E+02
beta-bhc	1.38E+01	9.94E+06	1.38E+01
beta-chloronaphthalene	NA	2.32E+07	2.32E+07
bis(2-chloro-1-methylethyl)ether	2.49E+02	2.93E+04	2.49E+02
bis(2-chloroethyl)ether	6.91E+00	6.91E+02	6.91E+00
bis(2-ethylhexyl)phthalate	2.10E+03	3.59E+09	2.10E+03
bromodichloromethane	1.30E+02	2.94E+03	1.30E+02
bromoform	3.34E+02	1.28E+05	3.34E+02
bromomethane	NA	1.15E+02	1.15E+02
carbazole	8.83E+02	6.66E+08	8.83E+02
carbon disulfide	1.43E+03	7.04E+04	1.43E+03
carbon tetrachloride	9.71E+01	1.35E+02	9.71E+01
chlordane	1.04E+00	1.55E+05	1.04E+00
chlorobenzene	NA	2.83E+04	2.83E+04
chloroform	1.49E+02	9.58E+02	1.49E+02
chloromethane	7.43E+02	7.40E+01	7.40E+01
chrysene	1.14E+02	5.06E+10	1.14E+02
cis-1,2-dichloroethene	1.34E+03	7.51E+03	1.34E+03
cumene	3.79E+03	5.73E+04	3.79E+03
dibenzo(a,h)anthracene	3.35E+00	6.34E+11	3.35E+00
dibromochloromethane	1.50E+02	1.54E+02	1.50E+02
dichlorodifluoromethane	2.14E+03	7.01E+02	7.01E+02
dieldrin	1.22E+00	2.33E+04	1.22E+00
diethyl phthalate	1.39E+05	6.03E+09	1.39E+05
di-n-butylphthalate	1.74E+04	4.19E+08	1.74E+04

TABLE 8
Site-Specific Health-Based Soil Screening Values for Organic Constituents Soil Exposure Pathways (mg/kg)

Constituent	Construction Worker Initial Value	Commercial/ Industrial User Initial Value	Final Value
di-n-octylphthalate	3.49E+02	1.80E+10	3.49E+02
endosulfan	1.46E+02	2.14E+08	1.46E+02
endrin	7.33E+00	1.37E+08	7.33E+00
ethyl chloride	1.42E+05	1.57E+06	1.42E+05
ethylbenzene	NA	7.33E+05	7.33E+05
fluoranthene	6.97E+03	3.03E+10	6.97E+03
fluorene	6.94E+03	1.40E+08	6.94E+03
gamma-bhc	2.32E+01	2.63E+05	2.32E+01
heptachlor	2.87E+00	1.78E+03	2.87E+00
heptachlor epoxide	3.14E-01	1.35E+03	3.14E-01
hexachlorobenzene	9.69E+00	2.80E+03	9.69E+00
hexachlorobutadiene	2.24E+02	7.13E+04	2.24E+02
hexachlorocyclopentadiene	8.87E+01	9.79E+02	8.87E+01
hexachloroethane	1.73E+02	2.39E+05	1.73E+02
indeno(1,2,3-cd)pyrene	1.47E+01	1.23E+11	1.47E+01
isobutyl alcohol	4.81E+04	2.55E+06	4.81E+04
isophorone	1.85E+04	2.92E+07	1.85E+04
methoxychlor	8.71E+01	1.48E+09	8.71E+01
methyl methacrylate	1.06E+03	5.56E+04	1.06E+03
methylene bromide	1.51E+03	2.75E+04	1.51E+03
methylene chloride	1.07E+03	1.26E+03	1.07E+03
methyl-tert-butyl ether	NA	1.39E+06	1.39E+06
n-butylbenzyl phthalate	3.48E+03	6.52E+09	3.48E+03
nitroaniline, o-	8.07E+03	2.45E+06	8.07E+03
nitrobenzene	8.61E+01	1.78E+05	8.61E+01
nitrosodiphenylamine, p-	8.02E+02	1.03E+07	8.02E+02
n-nitrosodimethylamine	2.60E-01	1.38E-02	1.38E-02
n-nitroso-di-n-propylamine	2.48E+00	4.46E+02	2.48E+00
n-nitrosodiphenylamine	1.96E+03	4.80E+09	1.96E+03
o-chlorotoluene	3.14E+03	1.05E+05	3.14E+03
p-chloro-m-cresol	3.48E+04	NA	3.48E+04
pentachlorophenol	3.04E+02	3.09E+07	3.04E+02
phenol	1.04E+04	3.14E+09	1.04E+04
pyrene	2.35E+03	4.11E+10	2.35E+03
styrene	3.02E+05	7.58E+06	3.02E+05
tetrachloroethene	3.36E+02	7.52E+03	3.36E+02
toluene	3.12E+04	2.41E+05	3.12E+04
toxaphene	1.47E+01	9.16E+04	1.47E+01
trans-1,2-dichloroethene	2.68E+03	1.47E+04	2.68E+03

TABLE 8
Site-Specific Health-Based Soil Screening Values for
Organic Constituents Soil Exposure Pathways (mg/kg)
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Constituent	Construction Worker Initial Value	Commercial/ Industrial User Initial Value	Final Value
trichloroethene	1.05E+03	1.39E+03	1.05E+03
trichlorofluoromethane	1.03E+04	4.89E+04	1.03E+04
vinyl acetate	5.41E+03	2.31E+05	5.41E+03
vinyl chloride	5.16E+00	1.81E-01	1.81E-01
xylenes	3.26E+04	2.61E+07	3.26E+04

TABLE 8
Site-Specific Health-Based Soil Screening Values for Inorganic Constituents Soil Exposure Pathways (mg/kg)
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Compound	Initial Value	ILM Background*	Final Value
aluminum	NT	3.63E+04	3.63E+04
antimony	9.05E+00	5.00E+00	9.05E+00
arsenic	8.87E+00	1.40E+01	1.40E+01
barium	2.52E+03	2.81E+02	2.52E+03
beryllium	1.56E+01	7.40E-01	1.56E+01
cadmium	1.64E+01	8.80E-01	1.64E+01
calcium	NT	3.80E+04	3.80E+04
chromium iii	3.22E+04	4.10E+01	3.22E+04
chromium vi	9.73E+01	NA	9.73E+01
cobalt	NT	2.00E+01	2.00E+01
copper	1.26E+03	5.30E+01	1.26E+03
cyanide	6.99E+02	NA	6.99E+02
iron	NT	6.05E+04	6.05E+04
lead	NT	1.11E+02	1.11E+02
mercury	6.78E+00	2.80E-01	6.78E+00
molybdenum	1.24E+03	2.30E+01	1.24E+03
nickel	2.39E+02	2.90E+01	2.39E+02
potassium	NT	8.26E+03	8.26E+03
selenium	1.82E+02	1.24E+03	1.24E+03
silver	1.30E+02	2.39E+02	2.39E+02
sodium	NT	1.96E+03	1.96E+03
thallium	NT	1.10E+01	1.10E+01
titanium	NT	1.95E+03	1.95E+03
vanadium	8.37E+01	8.20E+01	8.37E+01
zinc	8.73E+03	1.98E+02	8.73E+03

NOTES:

*ILM background values provided in Baseline Risk Assessment (G&M 1996).
NT = No Toxicity values available for calculation of HBRG
NA = Not Available.

TABLE 9
Remedial Excavations B41-RE-1 and PPL-RE-1
Excavated Soil Disposition Reference

		Screening Criteria Summary*		Soil Location				
				Backfill Area Boundries**				
Land Treatment Unit	Sample ID	Non-Haz Waste	Non-RCRA Haz Waste	North	East	South	West	Depth (bgs)
B41-LTU-1 (Stockpile A)	B41-GS-3-2'			4	A.13	17	A.8	5' - 4'
	B41-GS-4-3'	X						
	PL-GS-13-5'	X						
	B41-LTU1-GS-5							
Portion of Stockpile A	B41-GS-5-1'		X	To Be Disposed Off-Site as Non-RCRA Hazardous Waste				
B41-LTU-1 (Stockpiles MB, MC, MD, ME)	B41-LTU1-GS-1			4	A.13	17	A.8	4' - 2'
	B41-LTU1-GS-2			Additional material to be backfilled				
	B41-LTU1-GS-3							
	B41-LTU1-GS-4							
B41-LTU-2	B41-LTU2-GS-1			To Be Backfilled				
	B41-LTU2-GS-2							
B41-LTU-2 "carve out"	B41-GS-6-1'	X		To be Disposed Off-Site as Non-Hazardous Waste				
PH-LTU-2	PL-GS-14-2'	X		21	AL/AM	23	AM/AN	6' - grade
	PH-LTU-2-GS-1			4	A.12	17	A.8	3' - 2'
				Additional material to be backfilled				
PH-LTU-2A	PH-LTU-2A-GS-1			4	A.13	17	A.8	4' - 2'

* Blank space denotes soil samples which pass all screening criteria.
X Denotes stockpile disposition based on soil sample failing a screening criterion.
bgs = below ground surface

** Refer to Figure 12 for backfill locations

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