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PROJECT SPECIFIC PLAN FOR THE AREA 3 PRE-DESIGN INVESTIGATION OF POTENTIALLY CHARACTERISTIC AREAS

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

INFORMATION ONLY

OCTOBER 1998

U.S. DEPARTMENT OF ENERGY
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PROJECT SPECIFIC PLAN
FOR THE AREA PRE-DESIGN INVESTIGATION
OF POTENTIALLY CHARACTERISTIC AREAS

1761

Project Number 50.03.52.02

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LIST OF ACRONYMS AND ABBREVIATIONS

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ASL	analytical support level
AWWT	Advanced Wastewater Treatment (Facility)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
dpm	disintegrations per minute
DQO	Data Quality Objective
FACTS	Fernald Analytical Customer Tracking System
FEMP	Fernald Environmental Management Project
FDF	Fluor Daniel Fernald
FRL	final remediation level
g	gram
ICP/MS	inductively coupled plasma mass spectroscopy
mg/kg	milligram per kilogram
mg/L	milligram per liter
mL	milliliter
OSDF	On-Site Disposal Facility
OU5	Operable Unit 5
PID	photoionization detector
PSP	project specific plan
PWID	Project Waste Identification Document
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RWP	Radiological Work Permit
SCEP	Soil Characterization and Excavation Project
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SPL	Sample Processing Laboratory
TAL	target analyte list
TCLP	toxicity characteristic leaching procedure
V/FCN	Variance/Field Change Notice
WAO	Waste Acceptance Organization

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1.0 INTRODUCTION

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1.1 PROJECT BACKGROUND

The Operable Unit 5 (OU5) Record of Decision (ROD) established six areas at the Fernald Environmental Management Project (FEMP) that contain soil with the potential to exceed Resource Conservation and Recovery Act (RCRA) limits for characteristic hazardous waste. If characteristic hazardous waste is identified in these areas, it is prohibited from disposal in the On-Site Disposal Facility (OSDF) unless treatment removes the hazardous characteristic. Therefore, the OU5 ROD committed to performing additional sampling and analysis in the six areas so that soil confirmed as characteristic hazardous waste can be segregated for special handling and treatment.

Three of the six potentially characteristic areas are located in Soil Remediation Area 3, which is generally defined as the northern portion of the Former Production Area. These three areas are:

- Area South of the KC-2 Warehouse
- Scrap Metal Pile Area
- Area North of the Maintenance Building.

The locations of Area 3 and the three potentially characteristic areas are shown on Figure 1-1.

1.1.1 Potentially Characteristic Constituents

In order to determine if potentially characteristic soil is indeed "characteristic" (i.e., if it exhibits the characteristic of toxicity pursuant to 40 CFR 261.24), a sample undergoes toxicity characteristic leaching procedure (TCLP) analysis. If contaminant concentrations exceed the established regulatory levels, the material is considered to be characteristic and therefore requires special handling under RCRA. The accepted method to screen for the presence of potentially characteristic soil it to multiply the TCLP regulatory level by 20 and then compare this calculated value to the in-situ soil concentration of the constituent (this is called the "20-times rule").

For each of the three potentially characteristic areas within Area 3, the Final Sitewide Excavation Plan (SEP) established the following list of potentially characteristic constituents (see Table 2-3 of the Final SEP):

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Description of Area	Potentially Characteristic Constituents
Area between KC-2 Warehouse and adjacent to railroad tracks	Lead
Scrap Metal Pile Area	Lead
Area north of the Maintenance Building	Lead Trichloroethene

The U.S. Environmental Protection Agency established a TCLP limit of 5.0 mg/L for lead and 0.5 mg/L for trichloroethene; therefore, using the 20-times rule, total lead and trichloroethene concentrations in soil are considered potentially characteristic if they exceed 100 mg/kg and 10 mg/kg, respectively. The area south of the KC-2 Warehouse and the Scrap Metal Pile Area each had four RI/FS surface samples with total lead results exceeding 100 mg/kg. The area north of the Maintenance Building had two RI/FS locations with total lead results above 100 mg/kg (extending to a depth of 2.5 feet) and two RI/FS locations with trichloroethene results at or above 10 mg/kg (extending to a depth of 4.5 feet). These results are presented on Figures 2-3, 2-4, and 2-5.

1.1.2 Boundaries of Potentially Characteristic Areas

The OU5 ROD generally identified the locations of the potentially characteristic areas, but did not establish any definitive boundaries. Figure 1-5 of the SEP and Figure 1-1 of this project specific plan (PSP) used the written descriptions from the OU5 ROD to graphically identify the areas for further study. All RI/FS sample locations from these generally defined areas with results that exceed the 20-times rule thresholds for lead and trichloroethene will be resampled for TCLP analysis under this PSP. Additionally, samples will be taken outside of the generally-defined areas to bound the extent of contamination. Following completion of the activities outlined in this PSP, the definitive boundaries of the RCRA characteristic soil areas will be surveyed and mapped for use in developing the remedial design for Area 3.

1.2 SCOPE

Under this PSP, soil borings will be recovered from three areas within Area 3 (the area south of the KC-2 Warehouse, the Scrap Metal Pile Area, and the area north of the Maintenance Building) to determine if the subject areas are actually characteristic and to bound the extent of any confirmed characteristic soil in order to support the remedial design for excavation and waste segregation/

disposal. Following review of the sample results, additional samples may be taken beyond those identified in this PSP if the extent of characteristic hazardous waste has not been bound. In this situation, a variance to this PSP will be written. Sampling activities carried out under this PSP will be performed in accordance with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ), the SEP, and Data Quality Objective (DQO) SL-048, Rev. 4 (Appendix A).

1.3 PROJECT ORGANIZATION

Key team members responsible for conducting work in accordance with this PSP include team members from the Soil Characterization and Excavation Project (SCEP), Environmental Monitoring, Safety and Health, Quality Assurance, the FEMP Laboratory, and the U.S. Department of Energy (DOE). Key personnel for this predesign investigation are identified in Table 1-1.

TABLE 1-1
KEY PROJECT PERSONNEL

Title	Primary	Alternate
DOE Contact	Rob Janke	Kathi Nickel
Area 3 Project Manager	Rich Abitz	Jyh-Dong Chiou
Area 3 Characterization Lead	Christine Messerly	Rich Abitz
Field Sampling Lead	Mike Frank	Tom Buhrlage
Surveying Lead	Jim Schwing	Jim Capannari
Waste Acceptance Organization Contact	Linda Barlow	Sue Lorenz
FEMP Laboratory Contact	Bill Westerman	Jenny Vance
Data Validation Contact	Jenine Rogers	Jim Cross
Quality Assurance Contact	Reinhard Friske	Mary Eleton
Health and Safety Contact	Debbie Grant	Lewis Wiedeman

1.4 AREA 3 PREDESIGN INVESTIGATION STRATEGY

This document is one of a series of PSPs that will be developed and implemented for the predesign characterization of Area 3. Other PSPs address characterization of stockpiles, surface contamination

(using real-time monitoring and physical sampling), and subsurface contamination. Subsurface characterization will be implemented in two phases – Phase I will be performed before the completion of building decontamination and dismantlement while Phase II will focus on characterizing the areas beneath pads and building foundations.

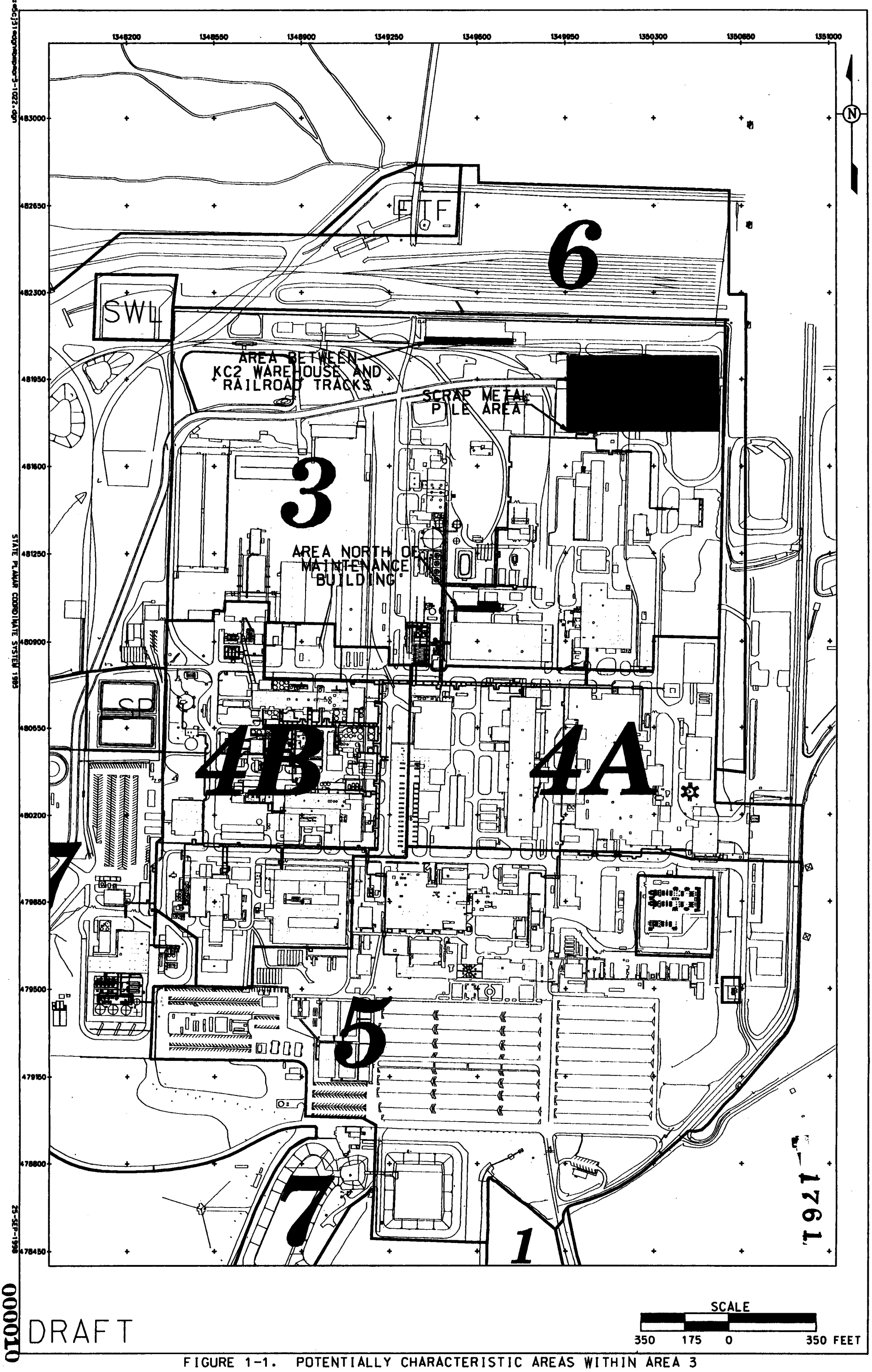

FIGURE 1-1. POTENTIALLY CHARACTERISTIC AREAS WITHIN AREA 3

2.0 SAMPLING PROGRAM

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2.1 GENERAL SOIL SAMPLING STRATEGY

Sampling and data analysis strategies have been developed to identify and bound potentially RCRA characteristic areas located within Area 3. Slightly different strategies have been developed for lead and trichloroethene contamination due to their physiochemical properties and differences in the nature and extent of contamination for each of the constituents. However, the basic sampling approach is similar for both constituents. RI/FS sample locations that exceeded the 20-times rule threshold for lead and trichloroethene will be resampled for TCLP analysis and additional samples will be taken from the area to bound the potentially characteristic areas. The results from all samples will be examined to determine if RCRA characteristic waste is present and, if present, whether it is bounded. If, based on available physical sampling results, an area containing RCRA characteristic waste is not bounded, additional data will be collected until the volume of RCRA characteristic waste has been defined.

The decision flowchart for lead sampling is presented on Figure 2-1. Because the RI/FS data indicates that the lead contamination is potentially spread over large areas, a combination of TCLP and total lead analysis will be used to screen for the presence of RCRA characteristic waste. In general, TCLP samples will be collected at RI/FS locations where lead was detected above the 20-times rule threshold, and total lead samples will be collected at new locations where RI/FS coverage is limited.

Following laboratory analysis, the total lead concentration from each TCLP sample location will be compared to the TCLP result (pass or fail). From this comparison, a total lead "screening level" will be established for each potentially characteristic area - locations with total lead results that are higher than the screening level will undergo additional TCLP analysis while locations with total lead results that are equal to or lower than the screening level will be identified as not meeting the definition of RCRA characteristic waste. The screening level is established as follows:

- If all samples from an area pass TCLP testing, the screening level will be the highest total lead result from a TCLP sampling location.
- If some of the samples from an area pass TCLP testing, the screening level will be the highest total lead result associated with a passing TCLP location.

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- If all samples from an area fail TCLP testing, the screening level will be the 20-times rule threshold (100 mg/kg).

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A comparison will also be made to ensure that the correlation of TCLP results to associated total lead concentrations is consistent throughout an area. If it is not consistent, an alternate screening level will have to be established. For example, in an area where three TCLP samples were collected and analyzed, an inconsistent correlation would be a total lead concentration of 200 mg/kg passes TCLP, a total lead concentration of 300 mg/kg fails TCLP, and a total lead concentration of 400 mg/kg passes TCLP. If this situation arises, the screening level will be established as the total lead concentration that passes TCLP, is lower than all total lead results associated with a failing TCLP location, and is above the 20-times rule threshold. If no locations meet these criteria, the 20-times rule threshold will be used as the screening level. In the previous example, the screening level would be 200 mg/kg.

Any location with total lead results above the screening level will have a sample sent to the laboratory for additional TCLP analysis. The results from TCLP samples will be compared to the lead TCLP regulatory limit (5.0 mg/L). If RCRA characteristic waste is present, a determination will be made as to whether the locations are bounded. If they are not, additional TCLP data will be collected, either by analyzing archived samples (if the holding times have not elapsed) or by collecting additional samples in the field. The new data will then be compared to the regulatory limit and the process will be repeated until all locations with RCRA characteristic waste have been bounded.

The decision flow chart for trichloroethene sampling is presented on Figure 2-2. Because the sample holding times for trichloroethene are shorter than those for lead, the trichloroethene investigation will consist of TCLP samples only. TCLP results will be compared to the trichloroethene TCLP regulatory limit of 0.5 mg/L. If RCRA characteristic waste is present, a determination will be made as to whether the characteristic areas are bounded. If they are not, additional samples will be collected and analyzed. The new data will then be compared to the regulatory limit and the process will be repeated until all locations with RCRA characteristic waste have been bounded.

Areas with RCRA characteristic waste will be considered bounded when there is existing RI/FS data or new sample results that are below the regulatory thresholds for RCRA characteristic waste (either

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below the TCLP limits or below the area-specific screening level, as appropriate) in the four coordinate directions and at depth.

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In order to provide additional information for remedial design, samples will also be analyzed for total uranium and thorium by inductively coupled plasma mass spectroscopy (ICP/MS). Although uranium and thorium results are not necessary to bound the potentially characteristic areas, these elements can be measured by the same analytical method used to obtain lead. Collecting this radionuclide data under this PSP will minimize the need to take additional uranium and thorium characterization samples from these areas in the future. Following characterization of lead and trichloroethene, additional uranium, thorium, and radium analyses will be conducted on collected samples for comparison to the final remediation levels (FRLs). Because the details of these additional laboratory analyses are not known at this time, a variance to this PSP will be written prior to beginning this effort. Analysis for technetium-99 is not necessary because the three potentially characteristic areas within Area 3 were not identified in the SEP as having technetium-99 levels potentially greater than the OSDF waste acceptance criteria or final remediation levels (see Figure 2-2 of the SEP).

The sampling strategy presented in this PSP was developed with the goal of collecting all of the samples needed to bound the potentially characteristic areas in one sampling event for lead characterization. This strategy involves archiving samples for future analysis (if the initial analytical data indicates that additional information is needed) which will minimize the cost and time associated with remobilizing sample teams to collect additional samples. One exception to this goal is when existing buildings or concrete/asphalt pads preclude fully bounding a potentially characteristic area. Each of the potentially characteristic areas have buildings or pads which may impede the definition of the RCRA areas. Additional characterization deficiencies in areas difficult to access, such as under buildings and pads, will be addressed as part of the subsurface characterization program for Area 3.

2.2 AREA-SPECIFIC SAMPLING PLANS

Area-specific sampling plans have been developed for each of the three potentially characteristic areas within Area 3. These plans are based on the general soil sampling strategy discussed above and the existing RI/FS data for each area.

2.2.1 KC-2 Warehouse

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The KC-2 Warehouse is located in the northern part of Area 3 (north of the OSDF Haul Road) and is currently used to store RCRA hazardous waste. Four surface samples collected during the RI/FS investigation identified potentially characteristic lead concentrations south of the KC-2 Warehouse, between the asphalt pad and the railroad tracks (Figure 2-3). The source of this contamination is not known, but it is thought to originate with fuel spills. Because the four RI/FS surface samples are the only source of information on lead contamination in the KC-2 Warehouse area, the proposed boring locations are intended to bound the known areas of lead contamination to the north, south, east, and west and to investigate the perimeter of the building to ensure that there are no additional areas of lead contamination. Figure 2-3 illustrates the location of the proposed borings in relation to the existing RI/FS sample locations.

Each boring (KC01 through KC21) will be completed to a depth of 3.5 feet below the soil surface, with soil samples collected from the 0'-0.5' interval. The top sample (0'-0.5') from each location will be used in the initial analysis (TCLP and/or total lead, as indicated on Figure 2-3) while the rest of the soil core will be archived for possible future analysis if RCRA characteristic soil is identified at the surface. Based on the RI/FS sample point to the south (11195), subsurface lead concentrations are expected to be lower than surface concentrations. For sample locations that will initially undergo total lead analysis only, an archive sample will be collected from the 0'-0.5' interval in case the total lead concentration warrants additional TCLP analysis. Appendix B contains the list of samples to be collected in the KC-2 Warehouse area and the applicable target analyte lists (TALs). Samples will be collected under the asphalt pad from five sampling locations (KC17 through KC21). For these borings, the 0'-0.5' sample interval will be considered the top 6 inches of soil beneath the pad. The pad surrounding the KC-2 Warehouse is asphalt in some areas and asphalt-coated concrete in other areas. The thickness of the concrete is unknown, but it is not expected to be a problem for the drilling equipment. If, however, the concrete prevents samples from being collected under this PSP, any necessary borings will be conducted during the Area 3 subsurface characterization program. Gravel used to line the railroad tracks may cover some proposed sampling locations. When this is the case, the 0'-0.5' sample will be considered the top 6 inches of soil beneath the gravel, as determined by the field geologist. This applies to any sample interval where gravel is present.

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2.2.2 Scrap Metal Pile Area

The Scrap Metal Pile Area is located in the northeast corner of Area 3 (Figure 2-4) and was used to recondition drums and store scrap metal. The existing Decontamination Pad is currently used to store debris. There are nine RI/FS sample locations with lead results in the Scrap Metal Pile Area (Figure 2-4). The field to the east of the area was certified during Area 1, Phase I remediation. The lead contamination in the area is believed to originate from lead paint that was removed from drums and other metal. Four RI/FS samples (SMA-1, SMA-4, SMA-5, and SMA-6) exceeded the 20-times rule threshold for lead (100 mg/kg) at the surface, and each is located in a separate part of the Scrap Metal Pile Area. Samples will be collected for TCLP analysis within a foot of each of these four locations. Because the locations of the elevated lead concentrations appear to be random, additional sample locations for total lead analysis were identified using a grid system. The sample locations are spaced approximately 100 feet apart to minimize the risk of missing an area with elevated lead concentrations. Figure 2-4 illustrates the locations of the proposed borings in relation to the existing RI/FS sample locations.

Each boring (SM01 through SM38) will be completed to a depth of 3.5 feet below the surface, with soil samples collected from the 0'-0.5' interval. The top sample (0'-0.5') from each location will be used in the initial analysis (TCLP and/or total lead, as indicated on Figure 2-4) while the rest of the soil core will be archived for possible future analysis if RCRA characteristic soil is identified at the surface. Because boring SM26 is located adjacent to a RI/FS location with a high lead concentration (569 mg/kg), an additional sample will be collected for TCLP analysis from the 1.0'-1.5' interval. Based on the RI/FS sample point to the west (11197), subsurface lead concentrations are expected to be lower than surface concentrations. For sample locations that will initially undergo total lead analysis only, an archive sample will be collected from the 0'-0.5' interval in case the total lead concentration warrants additional TCLP analysis. Appendix B contains the list of samples to be collected in the Scrap Metal Pile Area and the applicable TALs.

2.2.3 Maintenance Building

The Maintenance Building is located near the center of the Former Production Area. RI/FS sampling indicates that there are elevated levels of lead and trichloroethene in the area behind the building (Figure 2-5). This contamination most likely originated from fuel and solvent spills during routine maintenance operations performed at the Maintenance Building. Due to the existence of a relatively

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large amount of RI/FS data in the Maintenance Building area (as compared to the other two areas), fewer sample locations are needed to characterize the area. Figure 2-5 illustrates the location of the proposed borings in relation to the existing RI/FS sample locations.

RI/FS data from Boring 1308, located on the east side of the potentially characteristic area, indicated lead concentrations above the 20-times rule threshold (100 mg/kg) to a depth of 2.5 feet. To ensure that the lead is bounded at depth, the four borings in this area will be conducted to a depth of 5.5 feet. Soil samples from one location (MB06) will be collected at intervals of 0'-0.5', 1.0'-1.5', and 2.0'-2.5'. The three samples collected will undergo TCLP and total lead analysis, while the rest of the soil core will be archived for possible future analysis if RCRA characteristic soil is identified in the collected samples. Soil samples from locations surrounding MB06 (MB07 through MB09) will be collected from the 0'-0.5' interval. The top sample (0'-0.5') from each location will be used in the initial analysis for TCLP and total lead while the rest of the soil core will be archived for possible future analysis. If gravel is encountered at the surface of these sample locations, the 0'-0.5' sample will be considered the top 6 inches of soil beneath the gravel, as determined by the field geologist.

Two RI/FS borings on the west side of the potentially characteristic area (1307 and 1594) indicated levels of trichloroethene at or above the 20-times rule threshold (10 mg/kg) extending to a depth of 4.5 feet. Boring 1307 also indicated surface concentrations of lead above the 20-time rule threshold (100 mg/kg). Five borings (MB01 through MB05) will be completed in the area of RI/FS Borings 1307 and 1594 to a depth of 7.5 feet. Soil samples from each of these borings will be collected from the 0'-0.5', 1.0'-1.5', 2.0'-2.5', 3.0'-3.5', 4.0'-4.5', 5.0'-5.5', 6.0'-6.5', and 7.0'-7.5' intervals. TCLP for trichloroethene will be performed on samples from all intervals, TCLP for lead and total lead analysis will be performed on sample interval 0'-0.5', and samples from the 1.0'-1.5', 2.0'-2.5', and 3.0'-3.5' intervals will be archived for possible future lead TCLP analysis. The Field Sampling Lead will select a total of two 6-inch intervals from Borings MB01 through MB05 from which to collect samples for matrix spike and matrix spike duplicate analysis for TCLP trichloroethene at the off-site laboratory. Appendix B contains the list of samples to be collected in the Maintenance Building Area and the applicable TALs.

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2.3 FIELD SAMPLING METHODS

All soil borings will be completed using the Geoprobe® Model 5400 with the Macro-core sampler or dual tube sampling system. The dual tube must be used for borings with depths that exceed five feet. Geoprobe® sampling must be consistent with EQT-06, Geoprobe® Model 5400 Operation and Maintenance. A hand auger or direct push sampler may also be used if necessary. The soil classification/description will be limited to avoid disturbing the soil within the cores recovered for archive; however, the geologist will provide the best classification that is feasible based on the type of sampler that is used. This information will be recorded on a lithologic log.

All locations will be surveyed and marked with the location identification number (Appendix B) before sampling begins. If surface or subsurface obstacles prevent sample collection at any of the original locations, the location may be moved within a 1-foot radius if the sample location is adjacent to a RI/FS location and within a 3-foot radius for all new sample locations. If the distance is greater than one or three feet, as appropriate, from the originally planned sample point, the change must be documented on a Variance/Field Change Notice (V/FCN) form, as described in Section 4.4.

Prior to collection of the soil cores, the field sampling technician will remove any surface vegetation within a 6-inch radius from the points to be sampled, using a gloved hand and taking care not to remove any of the surface soil. The Geoprobe® will be driven to the appropriate depth, and upon removal all cores will be laid on new, clean plastic. If the bottom interval of a soil core is debris, the boring will be continued in 6-inch intervals until an interval of soil below the debris has been reached. At that time, the cover will be subjected to the evaluation by the field geologist, as appropriate, and a photoionization detector (PID) scan (for Maintenance Building area borings only). Additionally, a radiological screening will be performed on each core to identify the 6-inch interval with the highest gross activity and any 6-inch intervals greater than 450 corrected counts per minute (ccpm). In addition, the location and description of any debris or special material (e.g., process residue) contained in the soil core will be recorded. Results and relevant information will be recorded in the Lithological Log and Sample Collection Log. The 6-inch sample increments identified in Sections 2.2.1 through 2.2.3 and in Appendix B will then be placed into clean sample containers. The soil cores will be capped, taped, and labeled. The soil cores and additional samples assigned for archiving will remain in the custody of Environmental Monitoring team members and will be archived as appropriate. The archive samples collected in containers must be stored at a temperature of 2°-6°C. Because the soil cores are undisturbed, they do not have to be cooled for archive storage.

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The samples assigned for analysis will be placed into the appropriate container for transport to the Sample Processing Laboratory (SPL). Customer sample numbers and Fernald Analytical Customer Tracking System (FACTS) identification numbers will be assigned to all samples collected. The sample labels will be completed with the appropriate sample collection information.

The field geologist will complete a Lithologic Log and a Strip Log, and the field technicians will complete a Field Activity Log, Sample Collection Log, and Chain of Custody/Request for Analysis. All of these forms are to be completed in the field prior to submittal of the samples to the SPL.

2.4 EQUIPMENT DECONTAMINATION

Decontamination is performed to protect worker health and safety and to prevent the introduction of contaminants from sampling equipment to subsequent soil samples. Sampling equipment will be decontaminated prior to transport to the sample field site, between sample locations, and after sampling performed under this PSP is completed. Probe rods will be decontaminated using a high pressure wash method if the rods come into contact with the material being sampled. Equipment that comes into contact with the sample will be decontaminated at Level II (Section K.11, SCQ). Clean disposable wipes may be used to replace air drying of the equipment.

2.5 BOREHOLE ABANDONMENT

Each borehole will be plugged using bentonite pellets or a bentonite grout slurry immediately after sampling is completed. If pellets are used, they will be placed in the borehole in 2-foot intervals, then hydrated with potable water. The field geologist will direct the field team on which abandonment option will be used. Any concrete or asphalt that is removed will be replaced with an equal thickness of cement. A Borehole Abandonment Log will be completed for each borehole.

2.6 SAMPLE IDENTIFICATION

Each sample will be assigned a unique sample identification number as follows:

A3-Boring-Depth ID-Special Note, where:

A3	=	Sample collected for the predesign investigation of Area 3.
Boring	=	The boring number is composed of an acronym designating the potentially characteristic area in Area 3, as follows:

- the KC-2 Warehouse = KC,
- the Scrap Metal Pile Area = SM, and
- the Maintenance Building = MB.

This is followed by a sequential number, 01 through x, for each area.

Depth ID = The depth increment will be identified by a sequential number representing the 6-inch interval. The 0'-0.5' interval = "1", the 0.5'-1' interval = "2", and so on.

Special Note = "AB" indicates a sample for alpha/beta screening.
"V" indicates an archive sample.

Therefore, a 2.5'-3' sample collected from the fourth boring in the area of the Maintenance Building would be identified as A3-MB04-6.

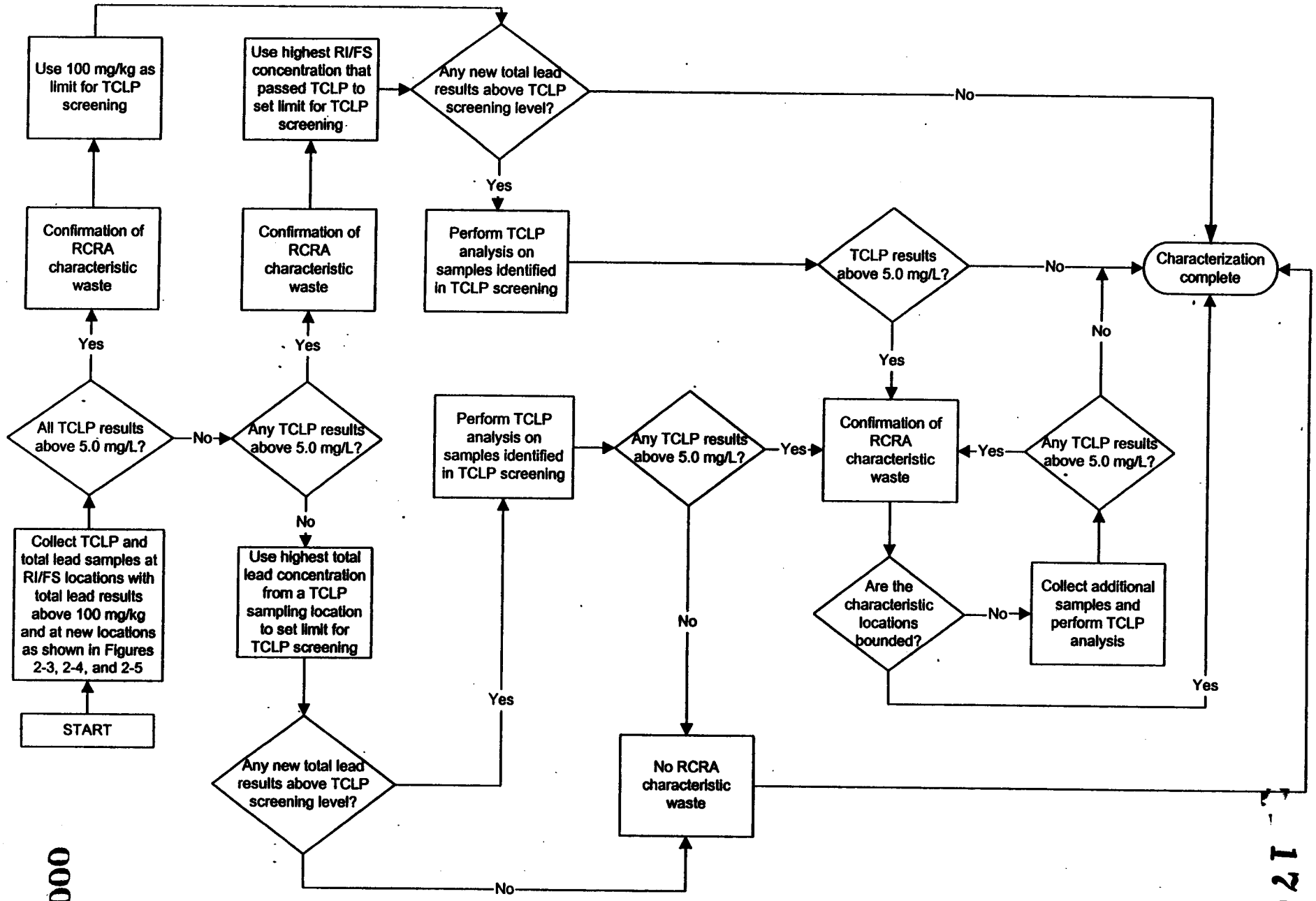

FIGURE 2-1

DECISION FLOW CHART FOR LEAD SAMPLING

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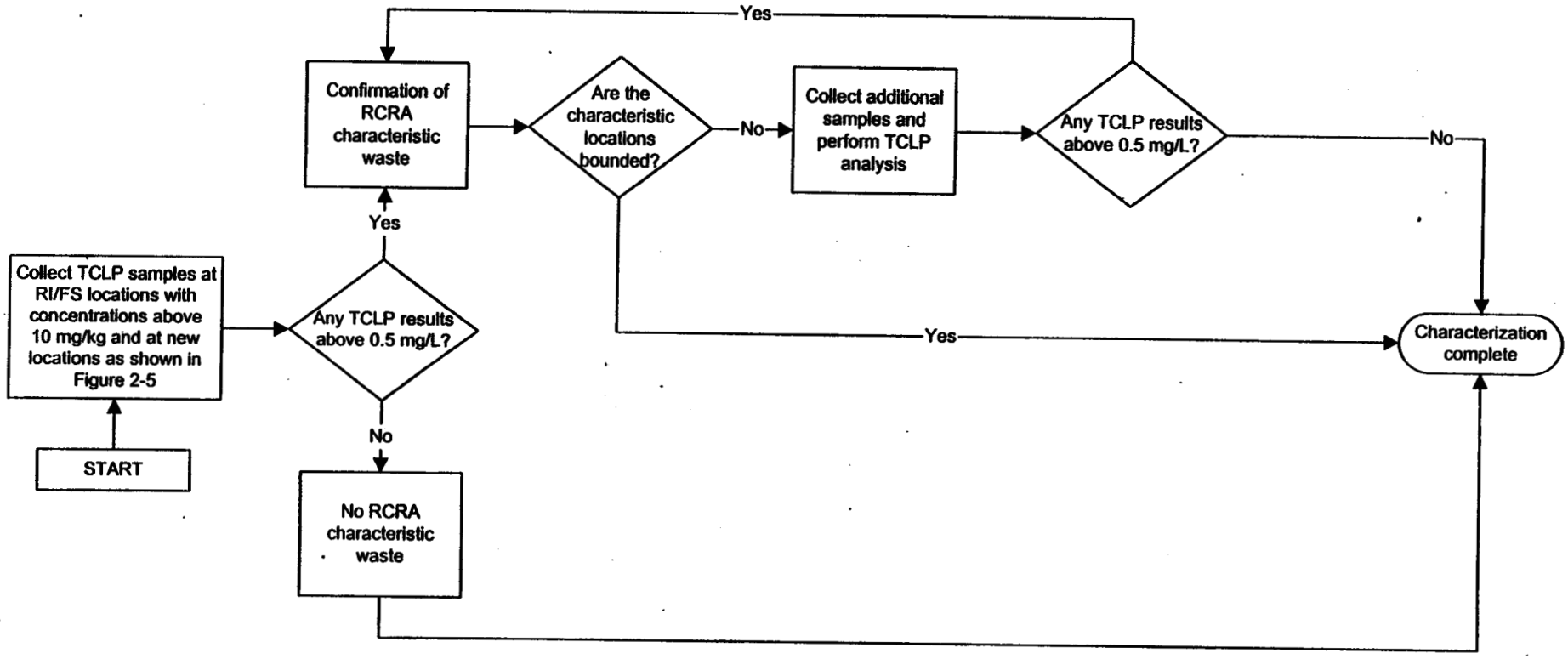

FIGURE 2-2

DECISION FLOW CHART FOR TRICHLOROETHENE SAMPLING

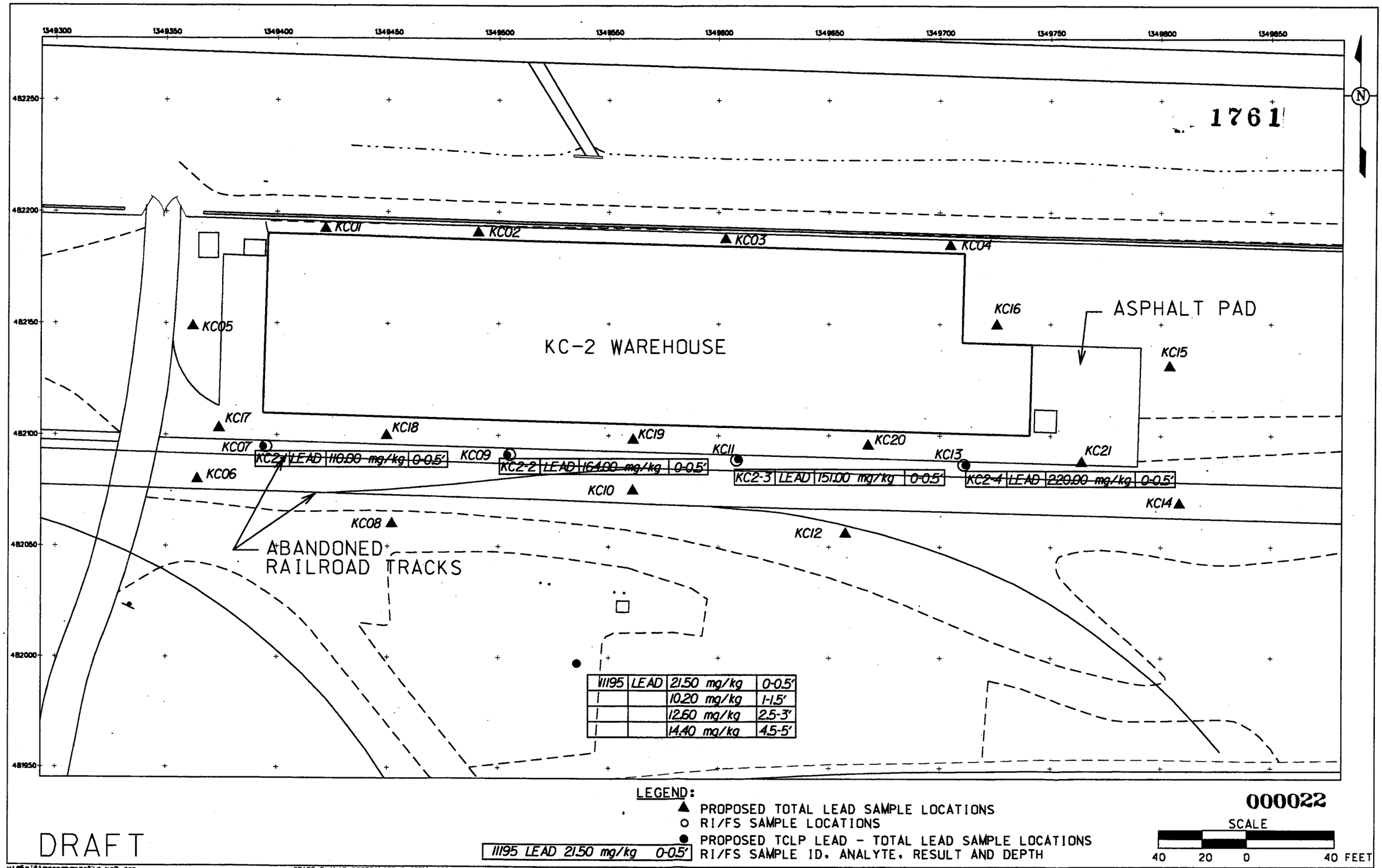

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FIGURE 2-3. EXISTING RI/FS DATA AND NEW SAMPLING LOCATIONS FOR KC-2 WAREHOUSE AREA

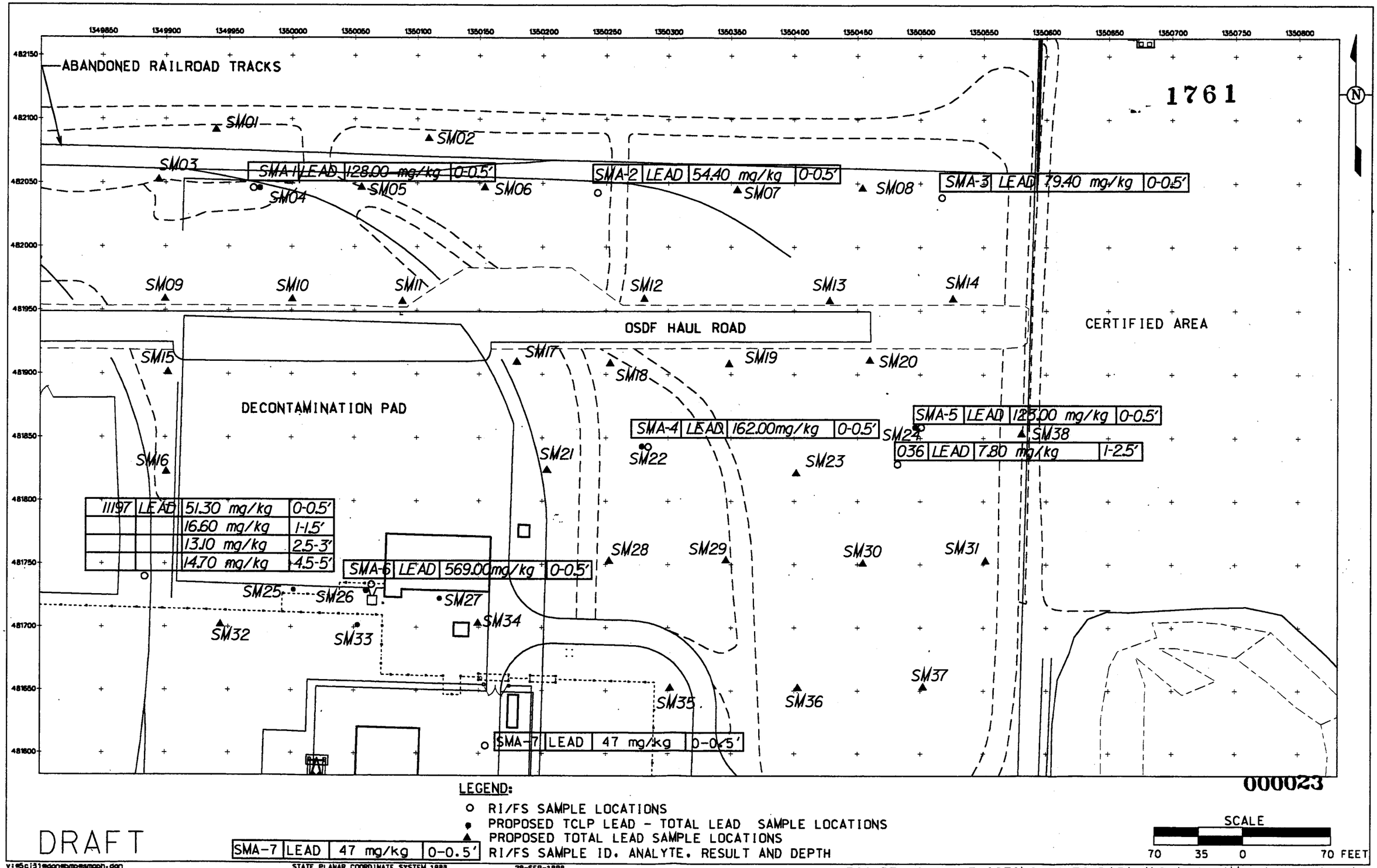
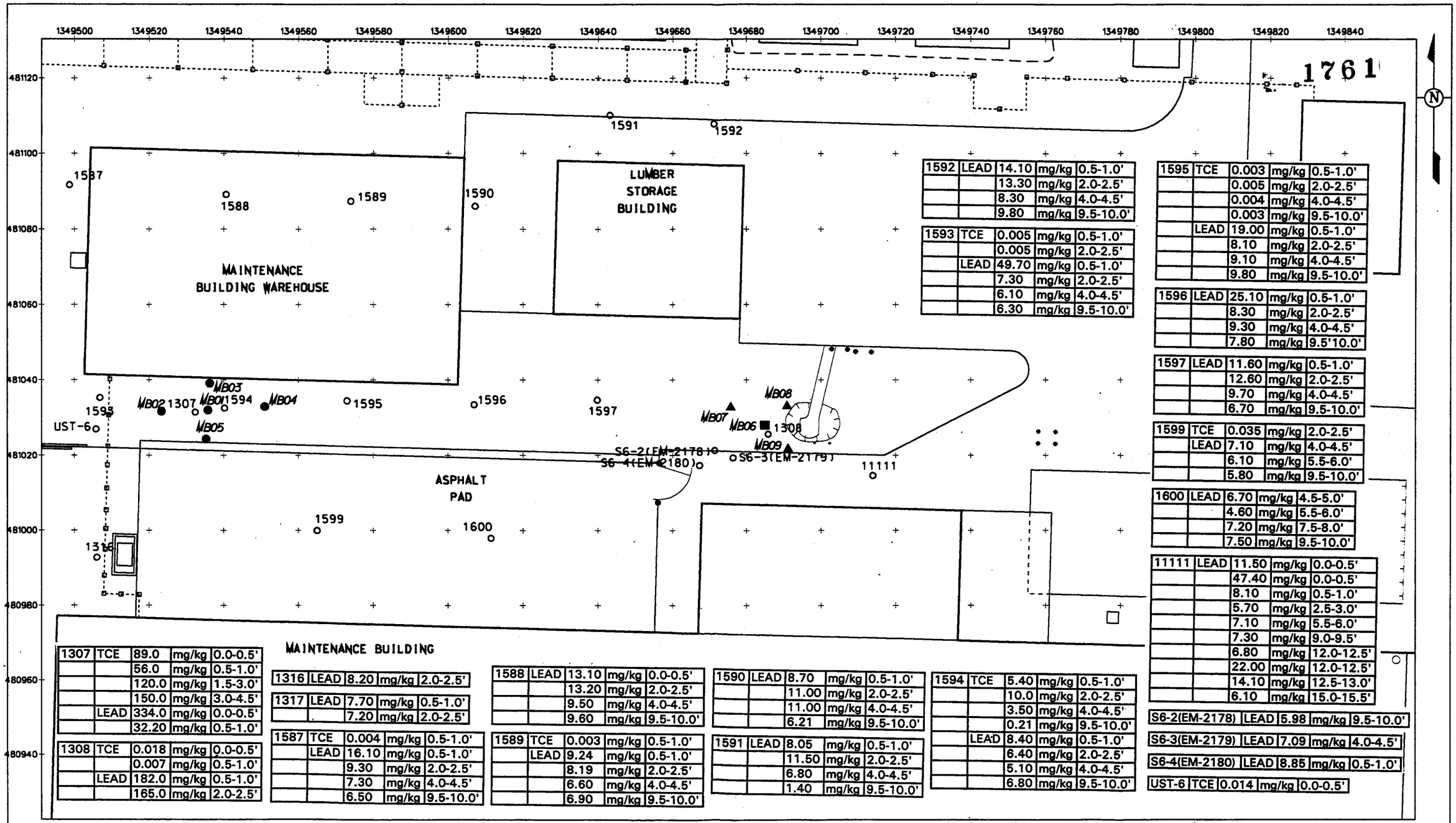


FIGURE 2-4. EXISTING RI/FS DATA AND NEW SAMPLING LOCATIONS FOR SCRAP METAL PILE AREA



1592	LEAD	14.10	mg/kg	0.5-1.0'
		13.30	mg/kg	2.0-2.5'
		8.30	mg/kg	4.0-4.5'
		9.80	mg/kg	9.5-10.0'

1593	TCE	0.005	mg/kg	0.5-1.0'
		0.005	mg/kg	2.0-2.5'
	LEAD	49.70	mg/kg	0.5-1.0'
		7.30	mg/kg	2.0-2.5'
		6.10	mg/kg	4.0-4.5'
		6.30	mg/kg	9.5-10.0'

1595	TCE	0.003	mg/kg	0.5-1.0'
		0.005	mg/kg	2.0-2.5'
		0.004	mg/kg	4.0-4.5'
		0.003	mg/kg	9.5-10.0'
	LEAD	19.00	mg/kg	0.5-1.0'
		8.10	mg/kg	2.0-2.5'
		9.10	mg/kg	4.0-4.5'
		9.80	mg/kg	9.5-10.0'

1596	LEAD	25.10	mg/kg	0.5-1.0'
		8.30	mg/kg	2.0-2.5'
		9.30	mg/kg	4.0-4.5'
		7.80	mg/kg	9.5'10.0'

1597	LEAD	11.60	mg/kg	0.5-1.0'
		12.60	mg/kg	2.0-2.5'
		9.70	mg/kg	4.0-4.5'
		6.70	mg/kg	9.5-10.0'

1599	TCE	0.035	mg/kg	2.0-2.5'
	LEAD	7.10	mg/kg	4.0-4.5'
		6.10	mg/kg	5.5-6.0'
		5.80	mg/kg	9.5-10.0'

1600	LEAD	6.70	mg/kg	4.5-5.0'
		4.60	mg/kg	5.5-6.0'
		7.20	mg/kg	7.5-8.0'
		7.50	mg/kg	9.5-10.0'

11111	LEAD	11.50	mg/kg	0.0-0.5'
		47.40	mg/kg	0.0-0.5'
		8.10	mg/kg	0.5-1.0'
		5.70	mg/kg	2.5-3.0'
		7.10	mg/kg	5.5-6.0'
		7.30	mg/kg	9.0-9.5'
		6.80	mg/kg	12.0-12.5'
		22.00	mg/kg	12.0-12.5'
		14.10	mg/kg	12.5-13.0'
		6.10	mg/kg	15.0-15.5'

S6-2(EM-2178)	LEAD	5.98	mg/kg	9.5-10.0'
S6-3(EM-2179)	LEAD	7.09	mg/kg	4.0-4.5'
S6-4(EM-2180)	LEAD	8.85	mg/kg	0.5-1.0'
UST-6	TCE	0.014	mg/kg	0.0-0.5'

1307	TCE	89.0	mg/kg	0.0-0.5'
		56.0	mg/kg	0.5-1.0'
		120.0	mg/kg	1.5-3.0'
		150.0	mg/kg	3.0-4.5'
	LEAD	334.0	mg/kg	0.0-0.5'
		32.20	mg/kg	0.5-1.0'

1308	TCE	0.018	mg/kg	0.0-0.5'
		0.007	mg/kg	0.5-1.0'
	LEAD	182.0	mg/kg	0.5-1.0'
		165.0	mg/kg	2.0-2.5'

1316	LEAD	8.20	mg/kg	2.0-2.5'

1317	LEAD	7.70	mg/kg	0.5-1.0'
		7.20	mg/kg	2.0-2.5'

1587	TCE	0.004	mg/kg	0.5-1.0'
	LEAD	16.10	mg/kg	0.5-1.0'
		9.30	mg/kg	2.0-2.5'
		7.30	mg/kg	4.0-4.5'
		6.50	mg/kg	9.5-10.0'

1588	LEAD	13.10	mg/kg	0.0-0.5'
		13.20	mg/kg	2.0-2.5'
		9.50	mg/kg	4.0-4.5'
		9.60	mg/kg	9.5-10.0'

1589	TCE	0.003	mg/kg	0.5-1.0'
	LEAD	9.24	mg/kg	0.5-1.0'
		8.19	mg/kg	2.0-2.5'
		6.60	mg/kg	4.0-4.5'
		6.90	mg/kg	9.5-10.0'

1590	LEAD	8.70	mg/kg	0.5-1.0'
		11.00	mg/kg	2.0-2.5'
		11.00	mg/kg	4.0-4.5'
		6.21	mg/kg	9.5-10.0'

1591	LEAD	8.05	mg/kg	0.5-1.0'
		11.50	mg/kg	2.0-2.5'
		6.80	mg/kg	4.0-4.5'
		1.40	mg/kg	9.5-10.0'

1594	TCE	5.40	mg/kg	0.5-1.0'
		10.0	mg/kg	2.0-2.5'
		3.50	mg/kg	4.0-4.5'
		0.21	mg/kg	9.5-10.0'
	LEAD	8.40	mg/kg	0.5-1.0'
		6.40	mg/kg	2.0-2.5'
		5.10	mg/kg	4.0-4.5'
		6.80	mg/kg	9.5-10.0'

NOTE: TCE = TRICHLOROETHENE

LEGEND:
- ○ RI/FS SAMPLE LOCATION
- ▲ PROPOSED TOTAL LEAD LOCATIONS
- ● PROPOSED TCLP LEAD - TCLP TRICHLOROETHENE LOCATIONS
- ■ PROPOSED TCLP LEAD - TOTAL LEAD LOCATIONS
- 7.09 mg/kg LEAD 4.0-4.5' RI/FS SAMPLE ID. ANALYTE. RESULT AND DEPTH

DRAFT

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SCALE

25 12.5 0 25 FEET

v:\5cj31\dgn\bmp\ar3-1021.dgn STATE PLANAR COORDINATE SYSTEM 1983 29-SEP-1998

FIGURE 2-5. EXISTING RI/FS DATA AND NEW SAMPLING LOCATIONS FOR MAINTENANCE BUILDING AREA

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3.0 SAMPLE ANALYSIS

All samples, with the exception of those being analyzed for TCLP trichloroethene, will be sent to the FEMP on-site laboratory for analysis. The TCLP trichloroethene samples will be sent to the SPL where they will be prepared for shipment to an approved off-site laboratory according to S.P. 766-S-1000, Shipping Samples to Offsite Laboratories. Sampling and analytical requirements are listed below in Table 3-1. The laboratories will analyze the sample for the applicable TAL, as identified in Table 3-2 and Appendix B. Total lead, uranium, and thorium analysis will be performed using ICP/MS.

TABLE 3-1
SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Sample Matrix	Lab	ASL	Preserve	Holding Time	Container	Sample Mass
TCLP Trichloroethene (TAL A)	Solid	Off-site	B	Cool to 2°-6°C	14 days	120-mL glass with Teflon-lined closure	100g
TCLP Lead (TAL B)	Solid	On-site	B	Cool to 2°-6°C	6 months	250-mL glass with Teflon-lined closure	100g
Total Lead Uranium Thorium (TAL C or D)	Solid	On-site	B	Cool to 2°-6°C	6 months	250 mL widemouth glass with Teflon-lined closure	20g
Alpha/Beta Screen*	Solid	On-site	N/A	None	None	Any container	10g

*The alpha/beta screen is only required for samples destined for off-site laboratories (i.e., those undergoing TCLP trichloroethene analysis).

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TABLE 3-2
TARGET ANALYTE LISTS (TALs)

TAL 50.03.52.02-A

TCLP Analysis- Soil		
1	ASL B	Trichloroethene

TAL 50.03.52.02-B

TCLP Analysis- Soil		
1	ASL B	Lead

TAL 50.03.52.02-C

Soil Analysis		
1	ASL B	Total Lead
2	ASL B	Uranium
3	ASL B	Thorium

TAL 50.03.52.02-D

Soil Analysis		
1	ASL B	Uranium
2	ASL B	Thorium

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4.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

4.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

Per requirements DQO SL-048, Rev. 4, the field quality control, analytical and data validation requirements are as follows:

- All analyses will be performed at Analytical Support Level (ASL) B.
- No field duplicate samples are required for ASL B. However, two matrix spike and matrix spike duplicate samples will be collected for off-site analysis of trichloroethene. Rinsate samples and trip blanks will not be collected for this investigation.
- All field data will be validated. All analytical data will require a certificate of analysis, and 10 percent of the analytical data will also require the associated quality assurance/quality control (QA/QC) results. A minimum 10 percent of the analytical data from each laboratory will be validated to ASL B. If any result is rejected, all data from the laboratory with the rejected result will then be validated to determine the integrity of the results from that laboratory. This change would be documented in a variance to this PSP.

4.2 PROCEDURES AND MANUALS

To ensure consistency and data integrity, field activities in support of the PSP will follow the requirements and responsibilities outlined in the procedures and guidance documents referenced below.

- ADM-02, *Field Project Prerequisites*
- EQT-05, *Geodimeter® 4000 Surveying System - Operation, Maintenance, and Calibration*
- SMPL-01, *Solids Sampling*
- S.P. 766-S-1000, *Shipping Samples to Offsite Laboratories*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance Manual*
- Sitewide CERCLA Quality Assurance Manual (SCQ)

4.3 INDEPENDENT ASSESSMENT

Independent assessment will be performed by the FEMP QA organization by conducting a surveillance, consisting of monitoring/observing on-going project activities and work areas to verify conformance to specified requirements. Surveillances will be planned and documented in accordance with Section 12.3 of the SCQ.

4.4 IMPLEMENTATION OF CHANGES

Once the Field Sampling Lead has obtained written or verbal approval (electronic mail is acceptable) from the Characterization Lead and QA for a change to the PSP, the change may be implemented. Changes to the PSP will noted in the applicable Field Activity Logs and on a V/FCN. QA must receive the completed V/FCN, which includes the signatures of the Characterization Lead, Sampling Manager, Area Project Manager, and QA, within seven days of implementation of the change.

5.0 HEALTH AND SAFETY

Technicians will conform to precautionary surveys performed by personnel representing the Utility Engineer, Industrial Hygiene, and Radiological Control as applicable. All work on this project will be performed in accordance with applicable Environmental Monitoring project procedures, RM-0020 (Radiological Control Requirements Manual), RM-0021 (Safety Performance Requirements Manual), Fluor Daniel Fernald (FDF) work permit, Radiological Work Permit (RWP), penetration permits, and other applicable permits. Concurrence with applicable safety permits is required by each technician in the performance of their assigned duties. A safety briefing will be conducted prior to the initiation of field activities. All emergencies shall be reported immediately to the site communication center at 648-6511 or contact "control" on the radio.

In the event that any soil sample is found to exceed 100,000 disintegrations per minute (dpm), the soil will be handled as high-level waste. The handling and disposal of this waste will be consistent with RP-0007, Radiological Posting and Access to Radiological Areas.

6.0 DISPOSITION OF WASTES

During completion of sampling activities, field personnel may generate small amounts of soil, water, and contact waste. Management of these waste streams will be coordinated with the Waste Acceptance Organization (WAO) through the Project Waste Identification Document (PWID) process. Soils will be spread at the point of origin, i.e., sampling locations. Generation of decontamination waters will be minimized in the field, and whenever possible, equipment will be decontaminated at a facility that discharges to the Advanced Wastewater Treatment (AWWT) Facility, either directly or indirectly, through the stormwater collection system. Contact waste generation will be minimized by limiting contact with sample media, and by only using disposable materials which are necessary. This waste stream will be evaluated against dumpster criteria during the PWID process. If it does not meet these criteria, an alternative means of disposal will be identified. PWID #459 has been developed specifically to support these sampling activities.

7.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed to satisfy data end use requirements after completion of the field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on the Field Activity Log which should be sufficient for accurate reconstruction of the events at a later date without reliance on memory. Sample Collection Logs, Lithologic Logs, Strip Logs, and Borehole Abandonment Records will be completed according to protocol specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the field sampling event. At least weekly, a copy of all field logs will be sent to the Area 3 Characterization Lead.

Field documentation, such as the Field Activity Log, Sample Collection Log, Lithologic Log, Strip Log, and Borehole Abandonment Logs will undergo an internal QA/QC review by the Environmental Monitoring Sample Technicians. A second QA/QC review of the records will be performed by FEMP QA personnel. Copies of the records will then be generated and delivered to data entry personnel for input into the Oracle System.

Upon receipt from the laboratories, 10 percent of the analytical data will be validated to ASL B. Validated data will be entered into FACTS, then transferred to the Sitewide Environmental Database (SED) by Remediation Data Management personnel. Manual, double keyed, data entry will be performed and data entered will be compared to the original data sheets. Corrections will be made, as necessary, then initialed and dated. Hard-copy data reports and documents will be kept in permanent storage in the Project Files. The electronic database is permanently archived in a neutral ASCII file format. Once analytical results have been placed in the SED, data can be accessed by the Area 3 Characterization Lead and/or the appointed project data lead. All project data will be reviewed to determine if it meets the data quality specified in the applicable DQO. Data from the SED will be used, along with information from the Strip Log, to perform the necessary data modeling to delineate any characteristic soil for remedial design.

APPENDIX A

DATA QUALITY OBJECTIVE SL-048, Rev. 4

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Control Number _____

Fernald Environmental Management Project

Data Quality Objectives

Title: Delineating the Extent of Constituents of Concern in Pre-design Investigation and Remediation Sampling

Number: SL-048

Revision: 4

Effective Date: July 14, 1998

Contact Name: Eric Kroger

Approval: (Signature on File) Date: 7/14/98
William D. Kelley
DQO Coordinator

Approval: (Signature on File) Date: 7/14/98
J.D. Chiou
SCEP Project Director

Rev. #	0	1	2	3	4	5	6
Effective Date:	9/19/97	10/3/97	4/15/98	6/17/98	7/14/98		

DATA QUALITY OBJECTIVES
Delineating the Extent of Constituents of Concern in Pre-design Investigation and Remediation Sampling

Members of Data Quality Objectives (DQO) Scoping Team
The members of the DQO team include a project lead, a project engineer, a field lead, a statistician, a lead chemist, a sampling supervisor, and a data management lead.

Conceptual Model of the Site
Media is considered contaminated if the concentration of a constituent of concern (COC) exceeds the final remediation levels (FRLs). The extent of specific media contamination was estimated and published in the Operable Unit 5 Feasibility Study (FS). These estimates were based on kriging analysis of available data for media collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. Maps outlining contaminated media boundaries were generated for the Operable Unit 5 FS by overlaying the results of the kriging analysis data with isoconcentration maps of the other constituents of concern (COCs), as presented in the Operable Unit 5 RI report, and further modified by spatial analysis of maps reflecting the most current media characterization data. A sequential remediation plan has been presented that subdivides the FEMP into seven construction areas. During the course of remediation, areas of specific media may require additional characterization so remediation can be carried out as thoroughly and efficiently as possible. As a result, additional sampling may be necessary to accurately delineate a volume of specific media as exceeding a target level, such as the FRL or the Waste Attainment Criterion (WAC). Each individual Project-Specific Plan (PSP) will identify and describe the particular media to be sampled.

1.0 Statement of Problem

If the extent (depth and/or area) of the media COC contamination is unknown, then it must be defined with respect to the appropriate target level (FRL, WAC, or other specified media concentration).

2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of media COC contamination in an area with respect to the appropriate target level.

3.0 Inputs That Affect the Decision

Informational Inputs - Historical data, process history knowledge, the modeled

extent of COC contamination, and the origins of contamination will be required to establish a sampling plan to delineate the extent of COC contamination. The desired precision of the delineation must be weighed against the cost of collecting and analyzing additional samples in order to determine the optimal sampling density. The project-specific plan will identify the optimal sampling density.

Action Levels - COCs must be delineated with respect to a specific action level, such as FRLs and On-Site Disposal Facility (OSDF) WAC concentrations. Specific media FRLs are established in the OU2 and OU5 RODs, and the WAC concentrations are published in the OU5 ROD. Media COCs may also require delineation with respect to other action levels that act as remediation drivers, such as Benchmark Toxicity Values (BTVs).

4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the remediation schedule. Time frames must allow for the scheduling of sampling and analytical activities, the collection of samples, analysis of samples and the processing of analytical data when received.

Scale of Decision Making - The decision made based upon the data collected in this investigation will be the extent of COC contamination at or above the appropriate action level. This delineation will result in media contaminant concentration information being incorporated into engineering design, and the attainment of established remediation goals.

Parameters of Interest - The parameters of interest are the COCs that have been determined to require additional delineation before remediation design can be finalized with the optimal degree of accuracy.

5.0 Decision Rule

If existing data provide an unacceptable level of uncertainty in the COC delineation model, then additional sampling will take place to decrease the model uncertainty. When deciding what additional data is needed, the costs of additional sampling and analysis must be weighed against the benefit of reduced uncertainty in the delineation model, which will eventually be used for assigning excavation, or for other purposes.

6.0 Limits on Decision Errors

In order to be useful, data must be collected with sufficient areal and depth coverage, and at sufficient density to ensure an accurate delineation of COC concentrations. Analytical sensitivity and reproducibility must be sufficient to

differentiate the COC concentrations below their respective target levels.

Types of Decision Errors and Consequences

Decision Error 1 - This decision error occurs when the decision maker determines that the extent of media contaminated with COCs above action levels is not as extensive as it actually is. This error can result in a remediation design that fails to incorporate media contaminated with COC(s) above the action level(s). This could result in the re-mobilization of excavation equipment and delays in the remediation schedule. Also, this could result in media contaminated above action levels remaining after remediation is considered complete, posing a potential threat to human health and the environment.

Decision Error 2 - This decision error occurs when the decision maker determines that the extent of media contaminated above COC action levels is more extensive than it actually is. This error could result in more excavation than necessary, and this excess volume of materials being transferred to the OSDF, or an off-site disposal facility if contamination levels exceed the OSDF WAC.

True State of Nature for the Decision Errors - The true state of nature for Decision Error 1 is that the maximum extent of contamination above the FRL is more extensive than was determined. The true state of nature for Decision Error 2 is that the maximum extent of contamination above the FRL is not as extensive as was determined. Decision Error 1 is the more severe error.

7.0 Optimizing Design for Useable Data

7.1 Sample Collection

A sampling and analytical testing program will delineate the extent of COC contamination in a given area with respect to the action level of interest. Existing data, process knowledge, modeled concentration data, and the origins of contamination will be considered when determining the lateral and vertical extent of sample collection. The cost of collecting and analyzing additional samples, will be weighed against the benefit of reduced uncertainty in the delineation model. This will determine the sampling density. Individual PSPs will identify the locations and depths to be sampled, the sampling density necessary to obtain the desired accuracy of the delineation, and if samples will be analyzed by the on-site or off-site laboratory. The PSP will also identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with field work requirements. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the COC action level. Sampling of groundwater monitoring wells may require different purge requirements than those stated in the SCQ (i.e., dry well definitions

or small purge volumes). In order to accommodating sampling of wells that may go dry prior to completing purging of three well volume, attempts to sample the monitoring wells will be made 24 hours after purging the well dry. If, after the 24 hour period, the well does not yield the required volume, the analytes will be collected in the order stated in the applicable PSP until the well goes dry. Any remaining analytes will not be collected. In some instances, after the 24 hour wait the well may not yield any water. For these cases, the well will be considered dry and will not be sampled.

7.2 COC Delineation

The media COC delineation will use all data collected under the PSP, and if deemed appropriate by the Project Lead, may also include existing data obtained from physical samples, and if applicable, information obtained through real-time screening. The delineation may be accomplished through modeling (e.g. kriging) of the COC concentration data with a confidence limit specific to project needs that will reduce the potential for Decision Error 1. A very conservative approach to delineation may also be utilized where the boundaries of the contaminated media are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Laboratory work will follow the requirements specified in the SCQ. If analysis is to be carried out by an off-site laboratory, it will be a Fluor Daniel Fernald approved full service laboratory. Laboratory quality control measures include a media prep blank, a laboratory control sample (LCS), matrix duplicates and matrix spike. Typical Field QC samples are not required for ASL B analysis. However the PSPs may specify appropriate field QC samples for the media type with respect to the ASL in accordance with the SCQ, such as field blanks, trip blanks, and container blanks. All field QC samples will be analyzed at the associated field sample ASL. If collected, the frequency of field QC sampling is as follows:

Duplicate samples will be taken at a minimum of one per 20 samples. Rinsates will be performed at a minimum of one per 20 samples or one per 20 field sampling tools that are re-used. Trip blanks will be taken at a minimum of one per shipping container when analyzing for volatile organic compounds (VOCs). For VOCs, container blanks will be taken at a minimum of one per Area and Phase per container type (i.e. stainless steel core liner/plastic core liner/Geoprobe tube) when using uncertified containers. Field blanks are not necessary for soil metal analysis, as it is unlikely in ambient field conditions to have metals cross contamination. However, the potential of cross contamination with semi-volatile organic compounds (SVOCs) is higher, therefore soil samples being analyzed for SVOCs may also require associated field blanks to be collected and analyzed. If collected,

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field blanks will be taken at a minimum of one per 20 soil samples.

Per the Sitewide Excavation Plan, the ASL and data validation requirements for soil and field QC samples collected in association with this DQO are as follows:

- If physical samples are analyzed for Pre-design Investigations and/or Pre-certification delineations, 100% of the data will be analyzed per ASL B requirements. 90% of the data will require only a Certificate of Analysis, the other 10% will require the Certificate of Analysis and all associated QA/QC results, and will be validated to ASL B. Per Appendix H of the SEP, the minimum detection level (MDL) for these analyses will be established at approximately 10% of the action level (the action level for precertification is the FRL; the action level for pre-design investigations can be several different action levels, including the FRL, the WAC, RCRA levels, ALARA levels, etc.). If this MDL is different from the SCQ-specified MDL, the ASL will default to ASL E, though other analytical requirements will remain as specified for ASL B.

- If samples are analyzed for WAC Attainment and/or RCRA Characteristic Areas Delineation, 100% of the data will be analyzed and reported to ASL B with 10% validated. The ASL B package will include a Certificate of Analysis along with all associated QA/QC results. Total uranium analyses using a higher detection limit than is required for ASL B (10 mg/kg) may be appropriate for WAC attainment purposes since the WAC limit for total uranium is 1,030 mg/kg. In this case, an ASL E designation will apply to the analysis and reporting to be performed under the following conditions:

    - all of the ASL B laboratory QA/QC methods and reporting criteria will apply with the exception of the total uranium detection limit

    - the detection limit will be ≤10% of the WAC limit (e.g., ≤103 mg/kg for total uranium).

- If delineation data are also to be used for certification, the data must meet the data quality objectives specified in the Certification DQO (SL-043).

All data will undergo an evaluation by the Project Team, including a comparison for consistency with historical data. Deviations from QC considerations resulting from evaluating inputs to the decision from Section 3, must be justified in the PSP such that the objectives of the decision rule in Section 5 are met.

7.4 Independent Assessment

Independent assessment shall be performed by the FEMP QA organization by conducting surveillances. Surveillances will be planned and documented in

accordance with Section 12.3 of the SCQ.

7.5 Data Management

Upon receipt from the laboratory, all results will be entered into the SED as qualified data using standard data entry protocol. The required ASL B, D or E data will undergo analytical validation by the FEMP validation team. A minimum of ten percent (10%) of field data will be validated by the FEMP QA validation team. The Project Manager will be responsible to determine data usability as it pertains to supporting the DQO decision of determining delineation of media COC's.

7.6 Applicable Procedures

Sample collection will be described in the PSP with a listing of applicable procedures. Typical related plans and procedures are the following:

- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ).
- SMPL-01, *Solids Sampling*
- SMPL-02, *Liquids and Sludge Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance*
- EQT-23, *Operation of High Purity Germanium Detectors*
- EQT-30, *Operation of Radiation Tracking Vehicle Sodium Iodide Detection System*

Data Quality Objectives
Delineating the Extent of Constituents of Concern in Pre-design Investigations and Remediation Sampling

1A. Task/Description: Delineating the extent of contamination above the FRLs

1.B. Project Phase: (Put an X in the appropriate selection.)

RI ☐ FS ☐ RD ☒ RA ☐ R_vA ☐ OTHER ☐

1.C. DQO No.: SL-048, Rev. 4 DQO Reference No.:_____

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2. Media Characterization: (Put an X in the appropriate selection.)

Air ☐ Biological ☐ Groundwater ☒ Sediment ☒ Soil ☒

Waste ☒ Wastewater ☐ Surface water ☐ Other (specify) _____

---

3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization
A ☐ B ☒ C ☐ D ☒ E ☒

Risk Assessment
A ☐ B ☐ C ☐ D ☐ E ☐

Evaluation of Alternatives
A ☐ B ☐ C ☐ D ☐ E ☐

Engineering Design
A ☐ B ☒ C ☐ D ☒ E ☒

Monitoring during remediation
A ☐ B ☒ C ☐ D ☒ E ☒

Other
A ☐ B ☐ C ☐ D ☐ E ☐

4.A. Drivers: Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and the OU2 and/or OU5 Record of Decision (ROD).

4.B. Objective: Delineate the extent of media contaminated with a COC (or COCs) with respect to the action level(s) of interest.

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5. Site Information (Description):

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1.	pH	X *	2.	Uranium	X *	3.	BTX
	Temperature	X *		Full Radiological	X *		TPH
	Specific Conductance	X *		Metals	X *		Oil/Grease
	Dissolved Oxygen	X *		Cyanide			
	Technetium-99	X *		Silica			

4.	Cations		5.	VOA	X *	6. Other (specify)
	Anions			BNA	X *	
	TOC			Pesticides	X *	
	TCLP	X *		PCB	X *	
	CEC			COD		

*If constituent is identified for delineation in the individual PSP.

6.B. Equipment Selection and SCQ Reference:

	Equipment Selection	Refer to SCQ Section
ASL A		SCQ Section:
ASL B	X	SCQ Section: App. G Tables G-1&G-3
ASL C		SCQ Section:
ASL D	X	SCQ Section: App. G Tables G-1&G-3
ASL E	X (See sect. 7.3, pg. 6)	SCQ Section: App. G Tables G-1&G-3

7.A. Sampling Methods: (Put an X in the appropriate selection.)

Biased	X	Composite		Environmental	X	Grab	X	Grid	X
Intrusive	X	Non-Intrusive		Phased		Source			

DQO Number: SL-048, Rev. 4

7.B. Sample Work Plan Reference: This DQO is being written prior to the PSPs.

Background samples: OU5 RI

7.C. Sample Collection Reference:

Sample Collection Reference: SMPL-01, SMPL-02, EQT-06

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8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	X *	Container Blanks	X ++
Field Blanks	X +	Duplicate Samples	X ***
Equipment Rinsate Samples	X ***	Split Samples	X **
Preservative Blanks	☐	Performance Evaluation Samples	☐
Other (specify)			

* For volatile organics only
** Split samples will be collected where required by EPA or OEPA.
*** If specified in PSP.
\+ Collected at the discretion of the Project Manager (if warranted by field conditions)
\+ + One per Area and Phase Area per container type (i.e. stainless steel core liner/plastic core liner/Geoprobe tube).

8.B. Laboratory Quality Control Samples:

Method Blank	X	Matrix Duplicate/Replicate	X
Matrix Spike	X	Surrogate Spikes	☐
Tracer Spike	☐		

Other (specify) Per SCQ

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

APPENDIX B

SOIL SAMPLES COLLECTED FOR THE INVESTIGATION OF POTENTIALLY CHARACTERISTIC AREAS IN AREA 3

APPENDIX B

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SOIL SAMPLES COLLECTED FOR THE INVESTIGATION OF POTENTIALLY CHARACTERISTIC AREAS IN AREA 3

Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
KC-2 WAREHOUSE AREA						
KC01	1349421.69	482192.46	0'-0.5'	A3-KC01-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC01-1V	Archive	
			0.5'-3.5'	A3-KC01-2V	Archive	
KC02	1349490.74	482190.78	0'-0.5'	A3-KC02-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC02-1V	Archive	
			0.5'-3.5'	A3-KC02-2V	Archive	
KC03	1349603.12	482187.99	0'-0.5'	A3-KC03-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC03-1V	Archive	
			0.5'-3.5'	A3-KC03-2V	Archive	
KC04	1349704.60	482185.19	0'-0.5'	A3-KC04-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC04-1V	Archive	
			0.5'-3.5'	A3-KC04-2V	Archive	
KC05	1349362.00	482148.69	0'-0.5'	A3-KC05-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC05-1V	Archive	
			0.5'-3.5'	A3-KC05-2V	Archive	
KC06	1349364.10	482080.10	0'-0.5'	A3-KC06-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC06-1V	Archive	
			0.5'-3.5'	A3-KC06-2V	Archive	
KC07	1349393.92	482094.90	0'-0.5'	A3-KC07-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-KC07-2V	Archive	
KC08	1349451.88	482060.25	0'-0.5'	A3-KC08-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC08-1V	Archive	
			0.5'-3.5'	A3-KC08-2V	Archive	
KC09	1349504.07	482091.35	0'-0.5'	A3-KC09-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-KC09-2V	Archive	

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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
KC10	1349560.95	482075.34	0'-0.5'	A3-KC10-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC10-1V	Archive	
			0.5'-3.5'	A3-KC10-2V	Archive	
KC11	1349609.11	482089.64	0'-0.5'	A3-KC11-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-KC11-2V	Archive	
KC12	1349657.39	482056.05	0'-0.5'	A3-KC12-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC12-1V	Archive	
			0.5'-3.5'	A3-KC12-2V	Archive	
KC13	1349711.60	482087.10	0'-0.5'	A3-KC13-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-KC13-2V	Archive	
KC14	1349808.31	482069.41	0'-0.5'	A3-KC14-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC14-1V	Archive	
			0.5'-3.5'	A3-KC14-2V	Archive	
KC15	1349803.83	482130.94	0'-0.5'	A3-KC15-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC15-1V	Archive	
			0.5'-3.5'	A3-KC15-2V	Archive	
KC16	1349726.12	482149.96	0'-0.5'	A3-KC16-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC16-1V	Archive	
			0.5'-3.5'	A3-KC16-2V	Archive	
KC17	1349373.75	482103.04	0'-0.5'	A3-KC17-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC17-1V	Archive	
			0.5'-3.5'	A3-KC17-2V	Archive	
KC18	1349449.50	482099.87	0'-0.5'	A3-KC18-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC18-1V	Archive	
			0.5'-3.5'	A3-KC18-2V	Archive	

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APPENDIX B
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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
KC19	1349561.11	482098.15	0'-0.5'	A3-KC19-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC19-1V	Archive	
			0.5'-3.5'	A3-KC19-2V	Archive	
KC20	1349667.59	482095.68	0'-0.5'	A3-KC20-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC20-1V	Archive	
			0.5'-3.5'	A3-KC20-2V	Archive	
KC21	1349764.00	482088.11	0'-0.5'	A3-KC21-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-KC21-1V	Archive	
			0.5'-3.5'	A3-KC21-2V	Archive	
SCRAP METAL PILE AREA						
SM01	1349939.44	482091.61	0'-0.5'	A3-SM01-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM01-1V	Archive	
			0.5'-3.5'	A3-SM01-2V	Archive	
SM02	1350109.01	482084.89	0'-0.5'	A3-SM02-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM02-1V	Archive	
			0.5'-3.5'	A3-SM02-2V	Archive	
SM03	1349894.47	482052.32	0'-0.5'	A3-SM03-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM03-1V	Archive	
			0.5'-3.5'	A3-SM03-2V	Archive	
SM04	1349974.41	482046.07	0'-0.5'	A3-SM04-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-SM04-2V	Archive	
SM05	1350055.25	482046.63	0'-0.5'	A3-SM05-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM05-1V	Archive	
			0.5'-3.5'	A3-SM05-2V	Archive	
SM06	1350153.99	482046.63	0'-0.5'	A3-SM06-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM06-1V	Archive	
			0.5'-3.5'	A3-SM06-2V	Archive	

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APPENDIX B
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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
SM07	1350354.58	482044.56	0'-0.5'	A3-SM07-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM07-1V	Archive	
			0.5'-3.5'	A3-SM07-2V	Archive	
SM08	1350453.84	482046.11	0'-0.5'	A3-SM08-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM08-1V	Archive	
			0.5'-3.5'	A3-SM08-2V	Archive	
SM09	1349899.64	481958.74	0'-0.5'	A3-SM09-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM09-1V	Archive	
			0.5'-3.5'	A3-SM09-2V	Archive	
SM10	1350000.45	481958.74	0'-0.5'	A3-SM10-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM10-1V	Archive	
			0.5'-3.5'	A3-SM10-2V	Archive	
SM11	1350088.33	481957.19	0'-0.5'	A3-SM11-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM11-1V	Archive	
			0.5'-3.5'	A3-SM11-2V	Archive	
SM12	1350280.64	481959.26	0'-0.5'	A3-SM12-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM12-1V	Archive	
			0.5'-3.5'	A3-SM12-2V	Archive	
SM13	1350427.96	481957.71	0'-0.5'	A3-SM13-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM13-1V	Archive	
			0.5'-3.5'	A3-SM13-2V	Archive	
SM14	1350526.19	481959.26	0'-0.5'	A3-SM14-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM14-1V	Archive	
			0.5'-3.5'	A3-SM14-2V	Archive	
SM15	1349902.09	481901.13	0'-0.5'	A3-SM15-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM15-1V	Archive	
			0.5'-3.5'	A3-SM15-2V	Archive	

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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
SM16	1349900.86	481822.69	0'-0.5'	A3-SM16-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM16-1V	Archive	
			0.5'-3.5'	A3-SM16-2V	Archive	
SM17	1350179.69	481909.70	0'-0.5'	A3-SM17-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM17-1V	Archive	
			0.5'-3.5'	A3-SM17-2V	Archive	
SM18	1350253.23	481908.48	0'-0.5'	A3-SM18-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM18-1V	Archive	
			0.5'-3.5'	A3-SM18-2V	Archive	
SM19	1350348.22	481907.87	0'-0.5'	A3-SM19-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM19-1V	Archive	
			0.5'-3.5'	A3-SM19-2V	Archive	
SM20	1350459.75	481910.93	0'-0.5'	A3-SM20-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM20-1V	Archive	
			0.5'-3.5'	A3-SM20-2V	Archive	
SM21	1350203.59	481824.49	0'-0.5'	A3-SM21-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM21-1V	Archive	
			0.5'-3.5'	A3-SM21-2V	Archive	
SM22	1350278.70	481843.23	0'-0.5'	A3-SM22-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-SM22-2V	Archive	
SM23	1350401.53	481822.03	0'-0.5'	A3-SM23-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM23-1V	Archive	
			0.5'-3.5'	A3-SM23-2V	Archive	
SM24	1350495.97	481858.38	0'-0.5'	A3-SM24-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-SM24-2V	Archive	
SM25	1350002.09	481729.70	0'-0.5'	A3-SM25-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-SM25-2V	Archive	

APPENDIX B
(continued)

Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
SM26	1350059.81	481729.20	0'-0.5'	A3-SM26-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			1.0'-1.5'	A3-SM26-3	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			1.5'-3.5'	A3-SM26-4V	Archive	
SM27	1350118.75	481723.07	0'-0.5'	A3-SM27-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-SM27-2V	Archive	
SM28	1350252.62	481752.75	0'-0.5'	A3-SM28-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM28-1V	Archive	
			0.5'-3.5'	A3-SM28-2V	Archive	
SM29	1350345.76	481753.37	0'-0.5'	A3-SM29-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM29-1V	Archive	
			0.5'-3.5'	A3-SM29-2V	Archive	
SM30	1350454.23	481750.92	0'-0.5'	A3-SM30-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM30-1V	Archive	
			0.5'-3.5'	A3-SM30-2V	Archive	
SM31	1350551.63	481752.75	0'-0.5'	A3-SM31-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM31-1V	Archive	
			0.5'-3.5'	A3-SM31-2V	Archive	
SM32	1349943.73	481701.86	0'-0.5'	A3-SM32-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM32-1V	Archive	
			0.5'-3.5'	A3-SM32-2V	Archive	
SM33	1350053.13	481701.86	0'-0.5'	A3-SM33-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			0.5'-3.5'	A3-SM33-2V	Archive	
SM34	1350149.25	481703.19	0'-0.5'	A3-SM34-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM34-1V	Archive	
			0.5'-3.5'	A3-SM34-2V	Archive	

Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
SM35	1350301.64	481652.22	0'-0.5'	A3-SM35-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM35-1V	Archive	
			0.5'-3.5'	A3-SM35-2V	Archive	
SM36	1350402.75	481652.22	0'-0.5'	A3-SM36-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM36-1V	Archive	
			0.5'-3.5'	A3-SM36-2V	Archive	
SM37	1350502.03	481652.83	0'-0.5'	A3-SM37-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM37-1V	Archive	
			0.5'-3.5'	A3-SM37-2V	Archive	
SM38	1350580.39	481853.25	0'-0.5'	A3-SM38-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-SM38-1V	Archive	
			0.5'-3.5'	A3-SM38-2V	Archive	
MAINTENANCE BUILDING AREA						
MB01	1349535.89	481032.08	0'-0.5'	A3-MB01-1	TAL A TAL B TAL C	TCLP (trichloroethene), TCLP (lead), total lead, uranium, thorium
			0'-0.5'	A3-MB01-1AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB01-3	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			1.0'-1.5'	A3-MB01-3AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB01-3V	Archive	
			2.0'-2.5'	A3-MB01-5	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			2.0'-2.5'	A3-MB01-5AB		Alpha/Beta Screen
			2.0'-2.5'	A3-MB01-5V	Archive	
			3.0'-3.5'	A3-MB01-7	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			3.0'-3.5'	A3-MB01-7AB		Alpha/Beta Screen
			3.0'-3.5'	A3-MB01-7V	Archive	
			4.0'-4.5'	A3-MB01-9	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			4.0'-4.5'	A3-MB01-9AB		Alpha/Beta Screen
			5.0'-5.5'	A3-MB01-11	TAL A TAL D	TCLP (trichloroethene), uranium, thorium

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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
MB01 (cont.)	1349535.89	481032.08	5.0'-5.5'	A3-MB01-11AB		Alpha/Beta Screen
			6.0'-6.5'	A3-MB01-13	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			6.0'-6.5'	A3-MB01-13AB		Alpha/Beta Screen
			7.0'-7.5'	A3-MB01-15	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			7.0'-7.5'	A3-MB01-15AB		Alpha/Beta Screen
MB02	1349523.44	481031.75	0'-0.5'	A3-MB02-1	TAL A TAL B TAL C	TCLP (trichloroethene), TCLP (lead), total lead, uranium, thorium
			0'-0.5'	A3-MB02-1AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB02-3	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			1.0'-1.5'	A3-MB02-3AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB02-3V	Archive	
			2.0'-2.5'	A3-MB02-5	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			2.0'-2.5'	A3-MB02-5AB		Alpha/Beta Screen
			2.0'-2.5'	A3-MB02-5V	Archive	
			3.0'-3.5'	A3-MB02-7	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			3.0'-3.5'	A30MB02-7AB		Alpha/Beta Screen
			3.0'-3.5'	A3-MB02-7V	Archive	
			4.0'-4.5'	A3-MB02-9	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			4.0'-4.5'	A3-MB02-9AB		Alpha/Beta Screen
			5.0'-5.5'	A3-MB02-11	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			5.0'-5.5'	A3-MB02-11AB		Alpha/Beta Screen
			6.0'-6.5'	A3-MB02-13	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			6.0'-6.5'	A3-MB02-13AB		Alpha/Beta Screen
			7.0'-7.5'	A3-MB02-15	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			7.0'-7.5'	A3-MB02-15AB		Alpha/Beta Screen

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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
MB03	1349536.38	481039.19	0'-0.5'	A3-MB03-1	TAL A TAL B TAL C	TCLP (trichloroethene), TCLP (lead), total lead, uranium, thorium
			0'-0.5'	A3-MB03-1AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB03-3	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			1.0'-1.5'	A3-MB03-3AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB03-3V	Archive	
			2.0'-2.5'	A3-MB03-5	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			2.0'-2.5'	A3-MB03-5AB		Alpha/Beta Screen
			2.0'-2.5'	A3-MB03-5V	Archive	
			3.0'-3.5'	A3-MB03-7	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			3.0'-3.5'	A3-MB03-7AB		Alpha/Beta Screen
			3.0'-3.5'	A3-MB03-7V	Archive	
			4.0'-4.5'	A3-MB03-9	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			4.0'-4.5'	A3-MB03-9AB		Alpha/Beta Screen
			5.0'-5.5'	A3-MB03-11	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			5.0'-5.5'	A3-MB03-11AB		Alpha/Beta Screen
			6.0'-6.5'	A3-MB03-13	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			6.0'-6.5'	A3-MB03-13AB		Alpha/Beta Screen
			7.0'-7.5'	A3-MB03-15	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			7.0'-7.5'	A3-MB03-15AB		Alpha/Beta Screen
MB04	1349551.10	481033.01	0'-0.5'	A3-MB04-1	TAL A TAL B TAL C	TCLP (trichloroethene), TCLP (lead), total lead, uranium, thorium
			0'-0.5'	A3-MB04-1AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB04-3	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			1.0'-1.5'	A3-MB04-3AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB04-3V	Archive	
			2.0'-2.5'	A3-MB04-5	TAL A TAL D	TCLP (trichloroethene), uranium, thorium

APPENDIX B
(continued)

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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
MB04 (cont.)	1349551.10	481033.01	2.0'-2.5'	A3-MB04-5AB		Alpha/Beta Screen
			2.0'-2.5'	A3-MB04-5V	Archive	
			3.0'-3.5'	A3-MB04-7	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			3.0'-3.5'	A3-MB04-7AB		Alpha/Beta Screen
			3.0'-3.5'	A3-MB04-7V	Archive	
			4.0'-4.5'	A3-MB04-9	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			4.0'-4.5'	A3-MB04-9AB		Alpha/Beta Screen
			5.0'-5.5'	A3-MB04-11	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			5.0'-5.5'	A3-MB04-11AB		Alpha/Beta Screen
			6.0'-6.5'	A3-MB04-13	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			6.0'-6.5'	A3-MB04-13AB		Alpha/Beta Screen
			7.0'-7.5'	A3-MB04-15	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			7.0'-7.5'	A3-MB04-15AB		Alpha/Beta Screen
MB05	1349535.39	481024.40	0'-0.5'	A3-MB05-1	TAL A TAL B TAL C	TCLP (trichloroethene), TCLP (lead), total lead, uranium, thorium
			0'-0.5'	A3-MB05-1		Alpha/Beta Screen
			1.0'-1.5'	A3-MB05-3	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			1.0'-1.5'	A3-MB05-3AB		Alpha/Beta Screen
			1.0'-1.5'	A3-MB05-3V	Archive	
			2.0'-2.5'	A3-MB05-5	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			2.0'-2.5'	A3-MB05-5AB		Alpha/Beta Screen
			2.0'-2.5'	A3-MB05-5V	Archive	
			3.0'-3.5'	A3-MB05-7	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			3.0'-3.5'	A3-MB05-7AB		Alpha/Beta Screen
			3.0'-3.5'	A3-MB05-7V	Archive	
			4.0'-4.5'	A3-MB05-9	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			4.0'-4.5'	A3-MB05-9AB		Alpha/Beta Screen

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Location	Easting	Northing	Depth	Sample ID	Analysis	Analytes
MB05 (cont.)	1349535.39	481024.40	5.0'-5.5'	A3-MB05-11	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			6.0'-6.5'	A3-MB05-11AB		Alpha/Beta Screen
			6.0'-6.5'	A3-MB05-13	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			6.0'-6.5'	A3-MB05-13AB		Alpha/Beta Screen
			7.0'-7.5'	A3-MB05-15	TAL A TAL D	TCLP (trichloroethene), uranium, thorium
			7.0'-7.5'	A3-MB05-15AB		Alpha/Beta Screen
MB06	1349684.86	481027.80	0'-0.5'	A3-MB06-1	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			1.0'-1.5'	A3-MB06-3	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			2.0'-2.5'	A3-MB06-5	TAL B TAL C	TCLP (lead), total lead, uranium, thorium
			2.5'-5.5'	A3-MB06-6V	Archive	
MB07	1349675.66	481032.81	0'-0.5'	A3-MB07-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-MB07-1V	Archive	
			0.5'-5.5'	A3-MB07-2V	Archive	
MB08	1349690.86	481033.09	0'-0.5'	A3-MB08-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-MB08-1V	Archive	
			0.5'-5.5'	A3-MB08-2V	Archive	
MB09	1349691.16	481021.76	0'-0.5'	A3-MB09-1	TAL C	Total lead, uranium, thorium
			0'-0.5'	A3-MB09-1V	Archive	
			0.5'-5.5'	A3-MB09-2V	Archive	

APPENDIX B
(continued)

SAMPLE SUMMARY

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	KC-2 Warehouse Area	Scrap Metal Pile Area	Maintenance Building Area	TOTAL
TAL A	0	0	40	**40**
TAL B	4	8	8	**20**
TAL C	21	39	11	**71**
TAL D	0	0	35	**35**
Total Lab. Analysis	**25**	**47**	**94**	**166**
Quality Control	0	0	2	**2**
Alpha/Beta Screen	0	0	40	**40**
Archive Samples	12	31	18	**61**
Archive Soil Cores	16	38	4	**58**
GRAND TOTAL	**53**	**116**	**158**	**327**

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