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WORK PLAN

Soil Arsenic and Lead Additional Delineation Work Plan for the Former Virginia-Carolina Chemical Company Phosphate/Fertilizer Plant, Wadesboro, North Carolina

Exxon Mobil Corporation
Houston, Texas

July, 2002

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LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Administrative Order on Consent
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
ExxonMobil	Exxon Mobil Corporation
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
QAPP	quality assurance project plan
SARA	Superfund Amendments and Reauthorization Act
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VCC	Virginia-Carolina Chemical Company

1. Introduction

1.1 Introduction

This Soil Arsenic and Lead Additional Delineation Work Plan (Work Plan) outlines the technical approach and methods for more completely delineating the magnitude and extent of soils containing arsenic and/or lead at concentrations greater than action levels at the former Virginia-Carolina Chemical Company (VCC) phosphate/fertilizer plant located in Wadesboro, North Carolina (the Site). Figure 1-1 identifies the site location on the U.S. Geological Survey (USGS) 7.5-minute quadrangle for Wadesboro, North Carolina.

The work will be completed in accordance with, and subject to, the terms, conditions, reservations of rights, denial of any admission of liability, and all other provisions of the Administrative Order on Consent (AOC) for Removal Action for the Site entered into voluntarily by Exxon Mobil Corporation (ExxonMobil), the successor in interest to the former VCC plant listed above, and the United States Environmental Protection Agency (USEPA) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The Docket Number for the AOC is 01-06-C. The effective date of the AOC is December 29, 2000. This Work Plan has been prepared in accordance with the requirements of the AOC.

1.2 Project Objectives

Initial characterization (Tetra Tech EMI, 2000; BBL, 2001b) of the magnitude and horizontal and vertical extent of soil containing arsenic and/or lead at concentrations greater than action levels indicated that soil in the southern portion of the site in the vicinity of the former acid chambers generally contained the highest arsenic and lead concentrations. ExxonMobil is currently evaluating alternatives for remediation of these soils and desires to delineate more finely the arsenic and lead concentrations in these soils so that more accurate cost estimates can be prepared. Therefore, the objective of this work is to more completely and accurately delineate the magnitude and horizontal and vertical extent of soil at the Site previously identified as containing arsenic and/or lead at concentrations above action levels. The data generated during the activities will be used as the final delineation data for the Site; therefore, no further areal delineation will be performed.

1.3 Work Plan Organization

This Work Plan is organized into four sections, beginning with this introduction. Section 2 presents the delineation strategy to be employed and Section 3 summarizes the sample collection and analysis procedures that will be utilized during the work. Finally, Section 4 lists the references cited in this Work Plan.

2. Delineation Strategy

2.1 Introduction

Initial characterization (Tetra Tech EMI, 2000; BBL, 2001b) of the magnitude and horizontal and vertical extent of soil containing arsenic and/or lead at concentrations greater than action levels indicated that soil in the southern portion of the site in the vicinity of the former acid chambers generally contained the highest arsenic and lead concentrations. The action levels for the Site are as follows:

	Action Levels (mg/kg)	
Analyte	**On-Site**	**Off-Site**
Arsenic	27	22
Lead	750	400

Existing data are presented in Tables 2-1 through 2-3 and shown on Figure 2-1.

During the evaluation of alternatives for the Site (BBL, 2002), Theissen polygons were drawn around each surface and subsurface soil sample to define the surface area that each sample represents (Figures 2-2 and 2-3). Surface areas and volumes of soil with arsenic and/or lead concentrations greater than action levels are presented in Tables 2-4 through 2-6. These data are used as the basis of the evaluation of the need for additional horizontal and vertical delineation discussed below.

2.2 Delineation Needs

2.2.1 Horizontal Delineation

As shown in Figure 2-1, the highest arsenic and lead concentrations are present in the soil in the southern area of the Site in the vicinity of the area of discolored soil. Figures 2-2 and 2-3 show the polygons that depict the areas with soil arsenic and/or lead concentrations greater than action levels.

Additional horizontal delineation is needed within the shaded polygons to accurately identify the outer boundaries of the area of soil with arsenic and/or lead concentrations greater than action levels (Figures 2-2 and 2-3). Of particular interest are the polygons that make up the northern boundary of the shaded area (polygons SB9, SB11, SB12, and SB14), because samples from single soil borings within these polygons are used to represent relatively large surface areas.

Additional horizontal delineation is also needed around the borings along the southern perimeter of the property to fully define the extent of elevated arsenic and lead concentrations. Physical boundaries to soil transport exist in the form of the bed of the former railroad spur to the southwest and a hill to the southeast; however, additional delineation between the perimeter borings and these physical features is needed to fully characterize the limits of the arsenic- and lead-containing soil. Finally, additional delineation is needed within off-site polygon SB20 to more closely define the limits of arsenic- and lead-containing soil around boring WB-SB20 as well as in the dry drainage ditch that drains the southern portion of the Site (polygons SD3 and SD4).

Additional delineation will only be performed for the metals that were present in the sample at concentrations above action levels (i.e., arsenic and/or lead). For example, at boring WB-SB09, only lead was present in the soil samples at concentrations exceeding action levels; therefore, additional delineation in polygon SB9 will

only be performed for lead. Conversely, at boring WB-SB16, only arsenic was present in the soil samples at concentrations exceeding action levels; therefore, additional delineation around this boring need only be performed for arsenic. Finally, both arsenic and lead will be measured around borings with samples that contained both of these metals at concentrations above action levels.

2.2.2 Vertical Delineation

During the site characterization (BBL, 2001b) soil samples were collected from each boring from the depths of 0 to 0.5 feet below ground surface (bgs), 2 to 4 feet bgs, 4 to 6 feet bgs, and in some borings 6 to 8 feet bgs and 8 to 10 feet bgs. The soil samples from the 0 to 0.5 foot bgs interval were collected as five-point composite samples of soil from the central soil boring and from four equally spaced surficial soil samples located approximately 20 feet from the central boring. The 0 to 0.5 and 2 to 4 feet bgs samples from every boring were analyzed. In borings where the 2 to 4 feet bgs samples contained potentially elevated arsenic and/or lead concentrations, samples from deeper intervals were also analyzed until arsenic and/or lead concentrations were no longer elevated. In this manner it was determined that soil containing arsenic and/or lead at concentrations greater than action levels was limited primarily to the upper two feet of soil, with elevated concentrations extending to no more than 4 feet bgs in only a few borings.

While the lower depth boundary of elevated arsenic and/or lead concentrations is generally well defined across the Site, additional vertical delineation is needed to further define the depth of impact from the 0.5 to 2 feet bgs depth interval. No data were collected from this depth interval during the site characterization; therefore, soil volume estimates made during the evaluation of alternatives for the site (BBL, 2002) made the assumption that the soil data from the 0 to 0.5 foot bgs soil interval was representative of the 0 to 2 feet bgs soil interval, which may have resulted in an overestimate of the volume of impacted soil that needs to be remediated. Therefore, additional delineation of the 0.5 to 2 foot bgs interval is needed in numerous borings to determine the actual depth of impacted soil. Additional vertical delineation will be performed in 6-inch increments.

2.3 Delineation Strategy

Most of the soils at the Wadesboro VCC site that contain arsenic and/or lead at concentrations exceeding the site-specific action levels are concentrated in and around an area of discolored soil located in the southern portion of the site (Figure 2-4). This area is referred to below as a "contiguous area". In addition, arsenic- and/or lead-containing soils are also present in the southern portion of the site at locations distinct from the contiguous area; these areas are referred to below as "isolated areas". The strategies employed for the delineation of each of these types of areas is described below.

2.3.1 Contiguous Area

The existing sampling data confirm that the area of discolored soil in the southern portion of the site contains soil with arsenic and lead concentrations greater than the action levels. The objective is to delineate the perimeter of this area, as well as to more finely delineate the depth of arsenic- and/or lead-impacted soil within this area.

A shallow trench (approximately 2 feet deep) will be excavated with a backhoe completely around the perimeter of the area of discolored soil (Figure 2-4) in an attempt to visually identify the limits of contamination via the observed presence of the pyrite slag and/or magenta-stained soil that is typically associated with the presence of elevated arsenic and/or lead concentrations at these types of sites. Existing samples included within the perimeter of this trench will be:

- VC-04-SS
- WB-SB19/VC-01-SS
- VC-08-SS
- WB-SB15/VC-08-SS
- VC-05-SS
- VC-01-SS

The trench will be backfilled with the excavated material upon completion of the delineation. The location of the trench will be flagged/marked and the flags surveyed after backfilling.

Soil samples will then be collected along the outer boundary of the trench at approximately 60 foot intervals using direct push methods. Samples will be collected from 0 to 4 feet below ground surface (bgs) at 0.5-foot intervals and analyzed for arsenic and lead. All samples colleted from 0 to 2 feet bgs will be analyzed. Samples collected from below 2 feet bgs will only be analyzed if the 1.5 to 2 feet bgs sample contains arsenic and/or lead at concentrations exceeding action levels. Samples collected from below 2 feet bgs will be analyzed sequentially from the shallowest to deepest samples. Once arsenic and lead are present at concentrations below site-specific action levels in a sample from a boring, no additional analyses will be performed for samples collected from depths deeper than this "clean" sample.

Additional borings may be advanced outside the perimeters of the trenches if the generated analytical data show that action levels have been exceeded in any of the perimeter samples. This iterative delineation will be performed until the soil samples do not contain arsenic and/or lead at concentrations greater than the action levels. The location and spacing of any additional borings will be determined in the field based on the analytical data and field conditions.

If there is visual evidence of potential contamination (e.g., pyrite slag, magenta-stained soils) in the bottom of the deepest sample interval collected, then a sample will be collected from the two feet below the area of potential visual contamination. This portion of the boring will be analyzed only if the sample immediately above it contains arsenic and/or lead above action levels. Samples will be analyzed in 0.5 foot intervals as described above.

Additional borings may also be advanced inside the perimeter of the trench if action levels in samples from the original perimeter borings have not been exceeded. This will be done to more closely delineate the impacted soil to reduce to the maximum extent possible the areal "footprint" of the soil that will have to be addressed during site remediation activities.

Upon completion of the delineation of the boundary of impacted soil in these areas, soil samples will be collected from additional borings advanced within the impacted area to more finely identify the depth of impacted soil. The spacing and location of these borings will be determined in the field based on the shape and size of the impacted areas. Samples will be collected to four feet bgs and analyzed as described above.

2.3.2 Isolated Areas

Samples from several soil borings located away from the area of discolored soil contained arsenic and/or lead concentrations greater than action levels. Arsenic and/or lead concentrations will be delineated around the following isolated borings:

- VC-07-SS (Pb only)
- WB-SB09 (Pb only)
- WB-SB11 (As & Pb)
- WB-SB12 (Pb only)
- WB-SB13 (As only)
- WB-SB14 (As & Pb)
- WB-SB16 (As only)
- WB-SB17 (As only)
- WB-SB20 (As & Pb)
- WB-SD03 (As & Pb)
- WB-SD04 (As & Pb)

Delineation of arsenic and/or lead concentrations around these borings will be performed only for the element that was detected in the samples from existing borings at a concentration greater than the site-specific action

level, as listed above. Delineation will be initiated by advancing four soil borings around the original boring. The four borings will surround the existing boring in the centers of four 10 foot by 10 foot grids as shown on Figure 2-4 (locations A1, A2, A3, and A4). These four borings will characterize an area of 400 square feet (in a 20 foot by 20 foot grid) around the original boring (Table 2-7).

Additional sampling may be performed beyond the initial four borings if necessary to complete the delineation to concentrations that are below the action levels. The location and intervals for additional delineation will be determined in the field based on an evaluation of the generated data and field conditions. For example (Figure 2-5), if the delineation soil boring "A1" results in concentrations that are above the action level (indicated with a circle around the soil boring location), three additional soil borings will be advanced (B1, B2, and B3). The three borings will be located in the center of three additional 10 foot by 10 foot grids located around the sample that exceeded the action level (the location that is circled). This delineation pattern will be used until the outer boring soil samples are below the action levels. In the example shown on Figure 2-5, only the soil boring A1 collected during the first round of delineation sampling exceeded the action levels, with all other locations being below the action levels. The area of remediation would then be defined to be the shaded area shown on Figure 2-5. This area connects the locations of the samples that resulted in concentrations below the action levels from the four initial borings (A1, A2, A3, and A4) and includes the 10 foot by 10 foot grid that represents sample A1. The area to be remediated will then encompass both of the samples that exceed the action levels (the original isolated boring location and delineation boring A1).

If visual evidence of potential contamination is observed in the bottom of the core, then an additional sample will be collected from the two foot interval below the area of potential contamination. This portion of the boring will be collected in 0.5 foot increments. These samples will be analyzed sequentially from top to bottom only if the sample immediately above it contains arsenic and /or lead at concentrations greater than action levels.

In addition, delineation borings around isolated locations WB-SD03 and WB-SD04, which are located in the southern drainage ditch (a linear feature) will be oriented such that one boring will be located 10 feet upstream, the second boring 10 feet downstream, and two borings located on either side of the ditch (Figure 2-4 and Table 2-7).

Soil borings will be advanced to 2 feet bgs around all isolated borings except WB-SB20. Elevated arsenic and lead concentrations were detected in the sample from boring WB-SB20 from 2 to 4 feet bgs (but not in samples from 0 to 0.5 or 4 to 6 feet bgs); therefore, soil borings around this boring will be advanced to 4 feet bgs. One soil sample will be composited from each boring from the 0 to 2 foot interval. A second soil sample will be collected from each of the borings around WB-SB20 from the 2 to 4 foot interval.

Additional vertical delineation will be performed at each original isolated boring listed above. Table 2-7 summarizes the delineation program that will be implemented to more finely identify the vertical boundaries of the soil containing arsenic and/or lead at concentrations above action levels. As with the horizontal delineation activities, vertical delineation will be performed only for the metals that are present in that boring at concentrations greater than action levels. Delineation of the 0.5 to 2 foot bgs interval will be performed at the isolated borings listed above, with the exception of WB-SB20, to determine the actual depth of impacted soil. Delineation of soil boring WB-SB20 will be performed from the 2 to 4 foot bgs interval. Additional vertical delineation will be performed in 6-inch increments.

3. Delineation Procedures

3.1 Introduction

This section provides the procedures that will be followed to collect and analyze the soil samples.

3.2 Initial Visual Delineation

A visual delineation of impacted around the area of discolored soil will be performed to initially define the areal extent of impact around this area. A two-foot deep trench will be excavated around the perimeter of the area of discolored soil to help further define the outer limits of impacted soil. The outer sidewalls will be inspected for the presence of physical characteristics representative of impacted soil, e.g., the presence of slag or discolored soil, that were identified during the sample collection and analysis activities. The trench will be backfilled with the excavated soil upon completion of the delineation and the location of the trench perimeter recorded via surveying.

3.3 Sample Collection

Soil samples will be collected using either manual (i.e., via hand auger or manual advancement of split spoons) or mechanical (i.e., Geoprobe) techniques at the locations described in Table 2-7 and shown on Figure 2-4. Geoprobe sampling will be performed whenever possible so that the most accurate description of boring lithology can be obtained. Soil sample collection and equipment decontamination procedures will be in accordance with the methods provided in the USEPA-approved Site Characterization Work Plan (BBL, 2001a). Samples will be analyzed as specified in Section 3.5, below. Information on the observed lithology will be recorded, along with photographs of cores (as appropriate), to collect information that may prove useful in the visual identification of potentially-impacted soil during remedial activities. The core name, scale, and interval of sample collection will be identified in the photographs. The location of all soil borings will be surveyed as specified in the Work Plan (BBL, 2001a).

3.4 Field Quality Control Samples

The following field quality control samples will be collected during soil sampling activities:

- Equipment rinse blanks will be collected at a frequency of one per day;
- Field duplicate samples will be collected at a frequency of 5% (1 for every 20 samples); and
- Matrix spike/matrix spike duplicate samples will be collected at a frequency of 5% (1 for every 20 samples).

Field quality control samples will be collected as specified in the Field Sampling Plan and Quality Assurance Project Plan, which are appended to the USEPA-approved Site Characterization Work Plan (BBL, 2001a).

3.5 Sample Analyses

All samples that will be analyzed to delineate the horizontal and vertical boundaries of the polygons will be sent to a fixed-base laboratory (TestAmerica of Nashville, Tennessee) for expedited analyses. Samples will be analyzed for arsenic and/or lead as specified in Table 2-7. Samples will be analyzed in accordance with the methods and procedures specified in the Quality Assurance Project Plan (QAPP) included in the USEPA-approved Site Characterization Work Plan (BBL, 2001a).

3.6 TCLP Analysis

During the additional delineation activities samples will be collected and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals to provide data on metals leachability that will be used to determine

potential treatment and/or disposal requirements. The number and location of the samples will be determined in the field based on the results of the additional delineation activities. TCLP analyses will be performed by TestAmerica of Nashville, Tennessee.

3.7 Treatability Test Samples

ExxonMobil is considering performing a treatability study for impacted soils to determine treatment alternatives to reduce the leachability of arsenic and lead. Soil samples may be collected to be provided to contractors who are preparing bids to perform site remediation work. The location and number of soil samples will be determined in the field based on the data generated during the delineation activities. Plastic, sealable five-gallon buckets will be filled from the designated sample locations for later shipment to the treatability study laboratory.

4. References

BBL. 2001a. Site Characterization Work Plan for the Former Virginia-Carolina Chemical Company Phosphate/Fertilizer Plant, Wadesboro, North Carolina. March 28, 2001.

BBL. 2001b. Site Characterization Report for the Former Virginia-Carolina Chemical Company Phosphate/Fertilizer Plant, Wadesboro, North Carolina (Revision 1). December 2001. Submitted to USEPA Region 4 on behalf of the Exxon Mobil Corporation.

BBL. 2002. Alternatives Evaluation Report, Wadesboro VCC Site, Wadesboro,, NC. April 2002. Submitted to USEPA Region 4 on behalf of the Exxon Mobil Corporation.

Tetra Tech EMI. 2000. Letter Report, Virginia Carolina Chemical Site, Wadesboro, Anson County, North Carolina. Letter from Steve Pierce, Tetra Tech EMI to John Nolen, USEPA. February 1, 2000.

Tables

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Table 2-1
Arsenic and Lead Concentrations in On-Site Soil Samples from USEPA Investigation, December 1999
Wadesboro VCC - Additional Delineation Work Plan

Analyte	Action Level: On-Site (mg/kg)	Sample Name, Description, and Depth (all results reported in mg/kg)							
		VC-01-SS discolored area; center (0.5 feet bgs)	VC-02-SB discolored area; center (1.5 feet bgs)	VC-03-SB discolored area; center (2.5 feet bgs)	VC-04-SS discolored area; NW corner (surficial)	VC-05-SS drainage ditch; pump house (surficial)	VC-06-SS concrete drainage path; NE RR spur (surficial)	VC-07-SS former acid chambers; SE corner (surficial)	VC-08-SS drainage ditch; 24" pipe (surficial)
Metals									
Arsenic	27	19.9	4	11.5	43.4	965	10.3	23.8	42.6
Lead	750	1,560	1,080	1,790	29,700	8,490	230	1,150	1,940

Notes:

bgs = below ground surface

Double-boxed values exceed on-site action levels

Table 2-2
Arsenic and Lead Concentrations in On-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

			Concentration in Sample:								
Analyte	On-site Action Level	Units	WB-SB01 0-0.5 ft bgs	WB-SB01 2-3.5 ft bgs	WB-SB02 0-0.5 ft bgs	WB-SB02 2-4 ft bgs	WB-SB03 0-0.5 ft bgs	WB-SB03 2-4 ft bgs	WB-SB04 0-0.5 ft bgs	WB-SB04 2-4 ft bgs	WB-SB05 0-0.5 ft bgs
Metals											
Arsenic	27	mg/kg	6.5	3.5	7.4	2.1 B	1.9 B	5.7	8.3	4.4	4.4
Lead	750	mg/kg	119 J	11.0 J	52.3	7.9	13.3	19.4	116 J	20.4 J	15.7 J
pH	--	S.U.	5.00	4.07	4.77	4.76	5.96	3.95	5.48	4.21	7.85

Table 2-2
Arsenic and Lead Concentrations in On-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

			Concentration in Sample:						
Analyte	On-site Action Level	Units	WB-SB05 2-4 ft bgs	WB-SB06 0-0.5 ft bgs	WB-SB06 2-4 ft bgs	WB-SB07 0-0.5 ft bgs	WB-SB07 2-3.5 ft bgs	WB-SB08 0-0.5 ft bgs	WB-SB08 2-4 ft bgs
Metals									
Arsenic	27	mg/kg	4.0	9.6	4.0	5.5	3.9	5.0	3.0
Lead	750	mg/kg	21.7 J	18.7 J	12.5 J	33.5 J	8.0 J	121	5.0
pH	--	S.U.	4.57	6.65	4.37	4.60	3.37	4.95	4.81

Table 2-2
Arsenic and Lead Concentrations in On-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

			Concentration in Sample:							
Analyte	On-site Action Level	Units	WB-SB09 0-0.5 ft bgs	WB-SB09 2-4 ft bgs	WB-SB10 0-0.5 ft bgs	WB-SB10 2-4 ft bgs	WB-SB11 0-0.5 ft bgs	WB-SB11 2-4 ft bgs	WB-SB12 0-0.5 ft bgs	WB-SB12 2-4 ft bgs
Metals										
Arsenic	27	mg/kg	14.8 J	7.3	10.9	7.8	33.7	8.6 J	8.5	14.9
Lead	750	mg/kg	1370 J	35.2	643 J	23.1 J	8520 J	15.3 J	32100 J	105 J
pH	--	S.U.	4.90	4.12	4.62	4.17	4.50	3.23	4.41	3.75

Table 2-2
Arsenic and Lead Concentrations in On-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

			Concentration in Sample:							
Analyte	On-site Action Level	Units	WB-SB13 0-0.5 ft bgs	WB-SB13 2-4 ft bgs	WB-SB14 0-0.5 ft bgs	WB-SB14 2-4 ft bgs	WB-SB15 0-0.5 ft bgs	WB-SB91[1] 0-0.5 ft bgs	WB-SB15 2-4 ft bgs	WB-SB90[2] 2-4 ft bgs
Metals										
Arsenic	27	mg/kg	54.8	4.1	84.1	8.3	25.6	21.2	91.2	55.1
Lead	750	mg/kg	453 J	7.7 J	1720 J	17.6 J	1410	1490 J	54.7 J	550 J
pH	--	S.U.	7.01	3.99	5.31	3.50	3.33	3.62	3.27	2.81

Table 2-2
Arsenic and Lead Concentrations in On-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

			Concentration in Sample:					
Analyte	On-site Action Level	Units	WB-SB15 4-6 ft bgs	WB-SB16 0-0.5 ft bgs	WB-SB16 2-4 ft bgs	WB-SB17 0-0.5 ft bgs	WB-SB17 2-4 ft bgs	WB-SB19 0-0.5 ft bgs
Metals								
Arsenic	27	mg/kg	6.4	44.6	4.7	34.2 J	6.4	112 J
Lead	750	mg/kg	15.1 J	664	8.4 J	658 J	20.7 J	19800 J
pH	--	S.U.	4.69	5.37	3.89	3.81	3.11	3.33

Table 2-2
Arsenic and Lead Concentrations in On-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

			Concentration in Sample:		
Analyte	On-site Action Level	Units	WB-SB92[13] 0-0.5 ft bgs	WB-SB19 2-4 ft bgs	WB-SB19 4-6 ft bgs
Metals					
Arsenic	27	mg/kg	122 J	38.9 J	6.2
Lead	750	mg/kg	80300 J	19.1 J	194
pH	--	S.U.	3.00	2.91	3.86

Table 2-2
Arsenic and Lead Concentrations in On-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

Notes:
\1 Blind field duplicate of sample WB-SB15 0-0.5 ft bgs
\2 Blind field duplicate of sample WB-SB15 2-4 ft bgs
\3 Blind field duplicate of sample WB-SB19 0-0.5 ft bgs
Double-boxed results exceed on-site action level

Table 2-3
Arsenic and Lead Concentrations in Off-Site Site Characterization Soil Samples
Wadesboro VCC - Additional Delineation Work Plan

			Concentration in Sample:					
Analyte	Off-site Action Level	Units	WB-SB18 2-4 ft bgs	WB-SB20 0-0.5 ft bgs	WB-SB20 2-4 ft bgs	WB-SB20 4-6 ft bgs	WB-SD03[1]	WB-SD04[1]
Metals								
Arsenic	22	mg/kg	3.5	14.2	72.4	21.6	17.7	51 J
Lead	400	mg/kg	8.5 J	162	478 J	147	408	611 J
pH	--	S.U.	3.48	6.80	4.85	5.80	4.58	4.11

Notes:

\1 Although these samples are numbered with a sediment sample convention, these samples were collected in a dry drainage ditch and are actually soil samples due to the absence of flow

Double-boxed results exceed off-site action level

Table 2-4
Soil Surface Area and Volume Above Site-Specific Action Levels: 0 - 2 Foot Depth Increment
Wadesboro VCC - Additional Delineation Work Plan

Polygon/ Sample Location	Polygon/ Sample ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	Arsenic Conc. (mg/kg)	As Conc. > Action Level?	Lead Conc. (mg/kg)	Pb Conc. > Action Level?	Surface Area Above Action Level (sq. ft.)			In-Place Volume Above Action Level (cy)		
								Total	On Site	Off Site	Total	On Site	Off Site
On Site	WB-SB01	17,707	0 - 2	6.5	No	119 J	No	0	0	NA	0	0	NA
	WB-SB02	71,502	0 - 2	7.4	No	52.3	No	0	0	NA	0	0	NA
	WB-SB03	59,908	0 - 2	1.9 B	No	13.3	No	0	0	NA	0	0	NA
	WB-SB04	46,401	0 - 2	8.3	No	116 J	No	0	0	NA	0	0	NA
	WB-SB05	33,112	0 - 2	4.4	No	15.7 J	No	0	0	NA	0	0	NA
	WB-SB06	25,878	0 - 2	9.6	No	18.7 J	No	0	0	NA	0	0	NA
	WB-SB07	28,835	0 - 2	5.5	No	33.5 J	No	0	0	NA	0	0	NA
	WB-SB08	36,570	0 - 2	5	No	121	No	0	0	NA	0	0	NA
	WB-SB09	22,087	0 - 2	14.8 J	No	1,370 J	YES	22,087	22,087	NA	1,636	1,636	NA
	WB-SB10	14,322	0 - 2	10.9	No	643 J	No	0	0	NA	0	0	NA
	WB-SB11	14,357	0 - 2	33.7	YES	8,520 J	YES	14,357	14,357	NA	1,063	1,063	NA
	WB-SB12	20,150	0 - 2	8.5	No	32,100 J	YES	20,150	20,150	NA	1,493	1,493	NA
	WB-SB13	7,272	0 - 2	54.8	YES	453 J	No	7,272	7,272	NA	539	539	NA
	WB-SB14	5,046	0 - 2	84.1	YES	1,720 J	YES	5,046	5,046	NA	374	374	NA
	WB-SB15	1,704	0 - 2	23.4	No	1,450 J	YES	1,704	1,704	NA	126	126	NA
	WB-SB16	2,407	0 - 2	44.6	YES	664	No	2,407	2,407	NA	178	178	NA
	WB-SB17	2,361	0 - 2	34.2 J	YES	658 J	No	2,361	2,361	NA	175	175	NA
	WB-SB19	1,330	0 - 2	117 J	YES	50,050 J	YES	1,330	1,330	NA	99	99	NA
	VC-01-SS	1,504	0 - 2	19.9	No	1,560	YES	1,504	1,504	NA	111	111	NA
	VC-04-SS	2,669	0 - 2	43.4	YES	29,700	YES	2,669	2,669	NA	198	198	NA
	VC-05-SS	3,318	0 - 2	965	YES	8,490	YES	3,318	3,318	NA	246	246	NA
	VC-06-SS	24,884	0 - 2	10.3	No	230	No	0	0	NA	0	0	NA
	VC-07-SS	9,494	0 - 2	23.8	No	1,150	YES	9,494	9,494	NA	703	703	NA
	VC-08-SS	1,181	0 - 2	42.6	YES	1,940	YES	1,181	1,181	NA	87	87	NA
Off Site	WB-SB18	11,856	0 - 2	20.3 J	No	174 J	No	0	NA	0	0	NA	0
	WB-SB20	11,577	0 - 2	14.2	No	162	No	0	NA	0	0	NA	0
	WB-SD03	1,600	0 - 2	17.7	No	408	YES	1,600	NA	1,600	119	NA	119
	WB-SD04	1,600	0 - 2	51 J	YES	611 J	YES	1,600	NA	1,600	119	NA	119
Totals:	**Totals:**	480,632	--	--		--		98,080	94,880	3,200	7,265	7,028	237

Table 2-4
Soil Surface Area and Volume Above Site-Specific Action Levels: 0 - 2 Foot Depth Increment
Wadesboro VCC - Additional Delineation Work Plan

Notes:

1. Polygon ID and area based on information shown on Figure 2-2.
2. For instances where a duplicate sample was available, the average of the samples was included in the table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in the above table are displayed as rounded numbers for table clarity.
4. Site-Specific Action Levels are:

	On-Site Soil	Off-Site Soil
Arsenic	27 mg/kg	22 mg/kg
Lead	750 mg/kg	400 mg/kg

NA = not applicable

Table 2-5
Soil Surface Area and Volume Above Site-Specific Action Levels: 2 - 4 Foot Depth Increment
Wadesboro VCC - Additional Delineation Work Plan

Polygon/ Sample Location	Polygon/ Sample ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	Arsenic Conc. (mg/kg)	As Conc. > Action Level?	Lead Conc. (mg/kg)	Pb Conc. > Action Level?	Surface Area Above Action Level (sq. ft.)			In-Place Volume Above Action Level (cy)		
								Total	On Site	Off Site	Total	On Site	Off Site
On Site	WB-SB01	17,707	2 - 4	3.5	No	11.0 J	No	0	0	NA	0	0	NA
	WB-SB02	71,502	2 - 4	2.1 B	No	7.9	No	0	0	NA	0	0	NA
	WB-SB03	59,908	2 - 4	5.7	No	19.4	No	0	0	NA	0	0	NA
	WB-SB04	46,401	2 - 4	4.4	No	20.4 J	No	0	0	NA	0	0	NA
	WB-SB05	33,112	2 - 4	4.0	No	21.7 J	No	0	0	NA	0	0	NA
	WB-SB06	30,388	2 - 4	4.0	No	12.5 J	No	0	0	NA	0	0	NA
	WB-SB07	28,835	2 - 4	3.9	No	8.0 J	No	0	0	NA	0	0	NA
	WB-SB08	37,970	2 - 4	3.0	No	5.0	No	0	0	NA	0	0	NA
	WB-SB09	39,913	2 - 4	7.3	No	35.2	No	0	0	NA	0	0	NA
	WB-SB10	15,683	2 - 4	7.8	No	23.1 J	No	0	0	NA	0	0	NA
	WB-SB11	16,229	2 - 4	8.6 J	No	15.3 J	No	0	0	NA	0	0	NA
	WB-SB12	20,150	2 - 4	14.9	No	105 J	No	0	0	NA	0	0	NA
	WB-SB13	9,687	2 - 4	4.1	No	7.7 J	No	0	0	NA	0	0	NA
	WB-SB14	5,046	2 - 4	8.3	No	17.6 J	No	0	0	NA	0	0	NA
	WB-SB15	3,461	2 - 4	73.2	YES	302.4 J	No	3,461	3,461	NA	256	256	NA
	WB-SB16	3,433	2 - 4	4.7	No	8.4 J	No	0	0	NA	0	0	NA
	WB-SB17	9,398	2 - 4	6.4	No	20.7 J	No	0	0	NA	0	0	NA
	WB-SB19	5,179	2 - 4	38.9 J	YES	19.1 J	No	5,179	5,179	NA	384	384	NA
Off Site	WB-SB18	11,856	2 - 4	3.5	No	8.5 J	No	0	NA	0	0	NA	0
	WB-SB20	11,577	2 - 4	72.4	YES	478 J	YES	11,577	NA	11,577	858	NA	858
Totals:		477,435	--	--		--		20,217	8,640	11,577	1,498	640	858

Notes:
1. Polygon ID and area based on information shown on Figure 2-3.
2. For instances where a duplicate sample was available, the average of the samples was included in the table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in the above table are displayed as rounded numbers for table clarity.
4. Site-Specific Action Levels are:

	On-Site Soil	Off-Site Soil
Arsenic	27 mg/kg	22 mg/kg
Lead	750 mg/kg	400 mg/kg

NA = not applicable

Table 2-6
Soil Surface Area and Volume Site-Specific Action Levels: 4 - 6 Foot Depth Increment
Wadesboro VCC - Additional Delineation Work Plan

Polygon/ Sample Location	Polygon/ Sample ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	Arsenic Conc. (mg/kg)	As Conc. > Action Level?	Lead Conc. (mg/kg)	Pb Conc. > Action Level?	Surface Area Above Action Level (sq. ft.)			In-Place Volume Above Action Level (cy)		
								Total	On Site	Off Site	Total	On Site	Off Site
On Site	WB-SB15	3,461	4 - 6	6.4	No	15.1 J	No	0	0	NA	0	0	NA
	WB-SB19	5,179	4 - 6	6.2	No	194.0	No	0	0	NA	0	0	NA
Off Site	WB-SB20	11,577	4 - 6	21.6	No	147	No	0	NA	0	0	NA	0
Totals:		20,217	--	--		--		0	0	0	0	0	0

Notes:
1. Polygon ID and area based on information shown on Figure 2-3.
2. All calculations and rounding are performed by the computer software. Therefore, certain quantities in the above table are displayed as rounded numbers for table clarity.
3. Site-Specific Action Levels are:

	On-Site Soil	Off-Site Soil
Arsenic	27 mg/kg	22 mg/kg
Lead	750 mg/kg	400 mg/kg

NA = not applicable

Table 2-7
Soil Sampling Plan
Wadesboro VCC - Additional Delineation Work Plan

Polygon/ Sample Location	On Site or Off Site	New Sample Location Increments	Sample Depth (ft.)[1]	Maximum Sample Depth (ft.)[1]	Analyte	Justification
WB-SB09	On Site	WB-SB09	0.5 - 1.0	2.0	Lead	Vertical delineation of lead to 2 feet
			1.0 - 1.5			Lead concentrations 0-0.5 ft bgs = 1,370 mg/kg; lead below the action level at 2-4 ft bgs
			1.5 - 2.0			All arsenic concentrations in this boring are below action level
		4 borings in 10' grid pattern around boring WB-SB09	0 - 2.0	2.0	Lead	Horizontal delineation of lead around boring WB-SB09
WB-SB11	On Site	WB-SB11	0.5 - 1.0	2.0	Lead, Arsenic	Vertical delineation of lead and arsenic to 2 feet
			1.0 - 1.5			Lead concentrations 0-0.5 ft bgs = 8,520 mg/kg; lead below the action level at 2-4 ft bgs
			1.5 - 2.0			Arsenic concentrations 0-0.5 ft bgs = 33.7 mg/kg; lead below the action level at 2-4 ft bgs
		4 borings in 10' grid pattern around boring WB-SB11	0 - 2.0	2.0	Lead, Arsenic	Horizontal delineation of lead and arsenic around boring WB-SB11
WB-SB12	On Site	WB-SB12	0.5 - 1.0	2.0	Lead	Vertical delineation of lead to 2 feet
			1.0 - 1.5			Lead concentrations 0-0.5 ft bgs = 32,100 mg/kg; lead below the action level at 2-4 ft bgs
			1.5 - 2.0			All arsenic concentrations in this boring are below action level
		4 borings in 10' grid pattern around boring WB-SB12	0 - 2.0	2.0	Lead	Horizontal delineation of lead around boring WB-SB12
WB-SB13	On Site	WB-SB13	0.5 - 1.0	2.0	Arsenic	Vertical delineation of arsenic to 2 feet
			1.0 - 1.5			Lead concentrations below action level at 0-0.5 and 2-4 ft bgs
			1.5 - 2.0			Arsenic concentrations 0-0.5 ft bgs = 54.8 mg/kg; lead below the action level at 2-4 ft bgs
		4 borings in 10' grid pattern around boring WB-SB13	0 - 2.0	2.0	Arsenic	Horizontal delineation of arsenic around boring WB-SB13
WB-SB14	On Site	WB-SB14	0.5 - 1.0	2.0	Arsenic, Lead	Vertical delineation of lead and arsenic to 2 feet
			1.0 - 1.5			Lead concentrations 0-0.5 ft bgs = 1,720 mg/kg; lead below the action level at 2-4 ft bgs
			1.5 - 2.0			Arsenic concentrations 0-0.5 ft bgs = 84.1 mg/kg; lead below the action level at 2-4 ft bgs
		4 borings in 10' grid pattern around boring WB-SB14	0 - 2.0	2.0	Arsenic, Lead	Horizontal delineation of lead and arsenic around boring WB-SB14
WB-SB16	On Site	WB-SB16	0.5 - 1.0	2.0	Arsenic	Vertical delineation of arsenic to 2 feet
			1.0 - 1.5			All lead concentrations in this boring are below action level
			1.5 - 2.0			Arsenic concentrations 0-0.5 ft bgs = 44.6 mg/kg; arsenic below the action level at 2-4 ft bgs
		4 borings in 10' grid pattern around boring WB-SB16	0 - 2.0	2.0	Arsenic	Horizontal delineation of arsenic around boring WB-SB16
WB-SB17	On Site	WB-SB17	0.5 - 1.0	2.0	Arsenic	Vertical delineation of arsenic to 2 feet
			1.0 - 1.5			All lead concentrations in this boring are below action level
			1.5 - 2.0			Arsenic concentrations 0-0.5 ft bgs = 44.6 mg/kg; arsenic below the action level at 2-4 ft bgs
		4 borings in 10' grid pattern around boring WB-SB17	0 - 2.0	2.0	Arsenic	Horizontal delineation of arsenic around boring WB-SB17

Table 2-7
Soil Sampling Plan
Wadesboro VCC - Additional Delineation Work Plan

Polygon/ Sample Location	On Site or Off Site	New Sample Location Increments	Sample Depth (ft.)[1]	Maximum Sample Depth (ft.)[1]	Analyte	Justification
VC-07-SS	On Site	VC-07-SS	0.5 - 1.0	2.0	Lead	Vertical delineation of lead to 2 feet; may need to sample deeper due to absence of data below 0.5 ft bgs. Lead concentrations 0-0.5 ft bgs = 1,150 mg/kg Arsenic concentrations are below the action level at 0-0.5 feet
			1.0 - 1.5			
			1.5 - 2.0			
		4 borings in 10' grid pattern around boring VC-07-SS	0 - 2.0	2.0	Lead	Horizontal delineation of lead around boring VC-07-SS
WB-SB20	Off Site	WB-SB20	2.0 - 2.5	4.0	Arsenic, Lead	Vertical delineation of lead and arsenic to 4 feet Lead concentrations 2-4 ft bgs = 478 mg/kg; lead below the action level at 0-0.5 and 4-6 ft bgs. Arsenic concentrations 2-4 ft bgs = 72.4 mg/kg; arsenic below the action level at 0-0.5 and 4-6 ft bgs
			2.5 - 3.0			
			3.0 - 3.5			
			3.5 - 4.0			
		4 borings in 10' grid pattern around boring WB-SB20	2.0 - 4.0	4.0	Arsenic, Lead	Horizontal delineation of lead and arsenic around boring WB-SB20
WB-SD03	Off Site	WB-SD03	0.5 - 1.0	2.0	Lead	Vertical delineation of lead to 2 feet; may need to sample deeper due to absence of data below 0.5 ft bgs.
			1.0 - 1.5			
			1.5 - 2.0			
		2 to 5 ft to the east (just outside of ditch)	0 - 0.5	2.0	Lead	Horizontal delineation of lead around boring WB-SD03.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			
		2 to 5 ft to the west (just outside of ditch)	0 - 0.5	2.0	Lead	Horizontal delineation of lead around boring WB-SD03.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			
		5 to10 ft to the north (upstream in ditch)	0 - 0.5	2.0	Lead	Horizontal delineation of lead around boring WB-SD03.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			
		5 to 10 ft to the south (downstream in ditch)	0 - 0.5	2.0	Lead	Horizontal delineation of lead around boring WB-SD03.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			

Table 2-7
Soil Sampling Plan
Wadesboro VCC - Additional Delineation Work Plan

Polygon/ Sample Location	On Site or Off Site	New Sample Location Increments	Sample Depth (ft.)\1	Maximum Sample Depth (ft.)\1	Analyte	Justification
WB-SD04	Off Site	WB-SD04	0.5 - 1.0	2.0	Arsenic, Lead	Vertical delineation of lead and arsenic to 2 feet; may need to sample deeper due to absence of data below 0.5 ft bgs.
			1.0 - 1.5			
			1.5 - 2.0			
		2 to 5 ft to the east (just outside of ditch)	0 - 0.5	2.0	Arsenic, Lead	Horizontal delineation of lead around boring WB-SD04.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			
		2 to 5 ft to the west (just outside of ditch)	0 - 0.5	2.0	Arsenic, Lead	Horizontal delineation of lead around boring WB-SD04.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			
		5 to 10 ft to the north (upstream in ditch)	0 - 0.5	2.0	Arsenic, Lead	Horizontal delineation of lead around boring WB-SD04.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			
		5 to 10 ft to the south (downstream in ditch)	0 - 0.5	2.0	Arsenic, Lead	Horizontal delineation of lead around boring WB-SD04.
			0.5 - 1.0			
			1.0 - 1.5			
			1.5 - 2.0			

Notes:
\1 Samples will be collected and analyzed at 0.5-foot intervals until the concentration of the metal-of-interest in that boring is below the applicable action level; therefore, it may not be necessary to collect and analyze samples from all depth intervals listed on this table.

Figures

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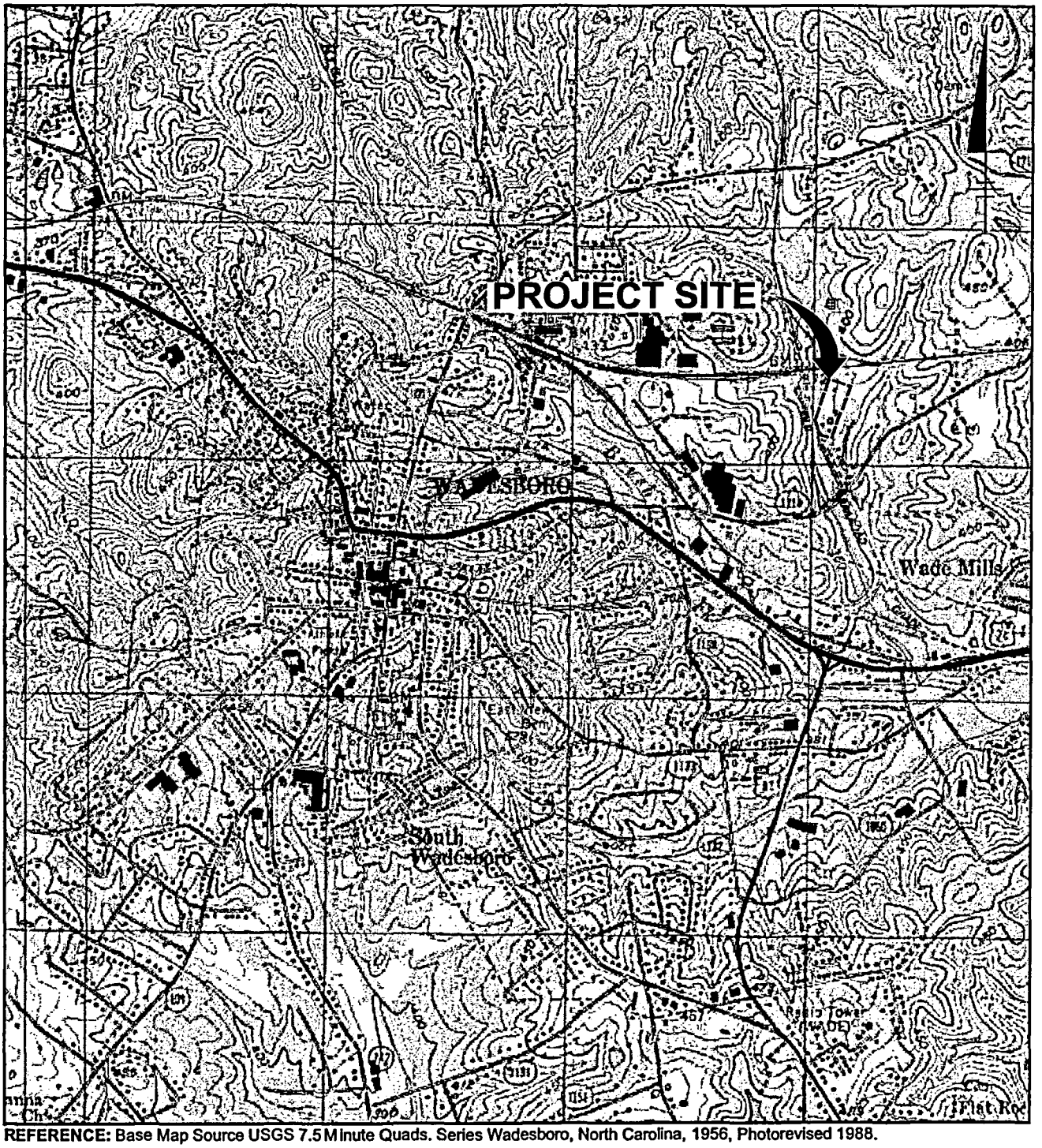

REFERENCE: Base Map Source USGS 7.5 Minute Quads. Series Wadesboro, North Carolina, 1956, Photorevised 1988.

2000' 0 2000'

Approximate Scale: 1" = 2000'

AREA LOCATION

VIRGINIA-CAROLINA CHEMICAL CO. SITE
WADESBORO, NORTH CAROLINA

SITE LOCATION MAP

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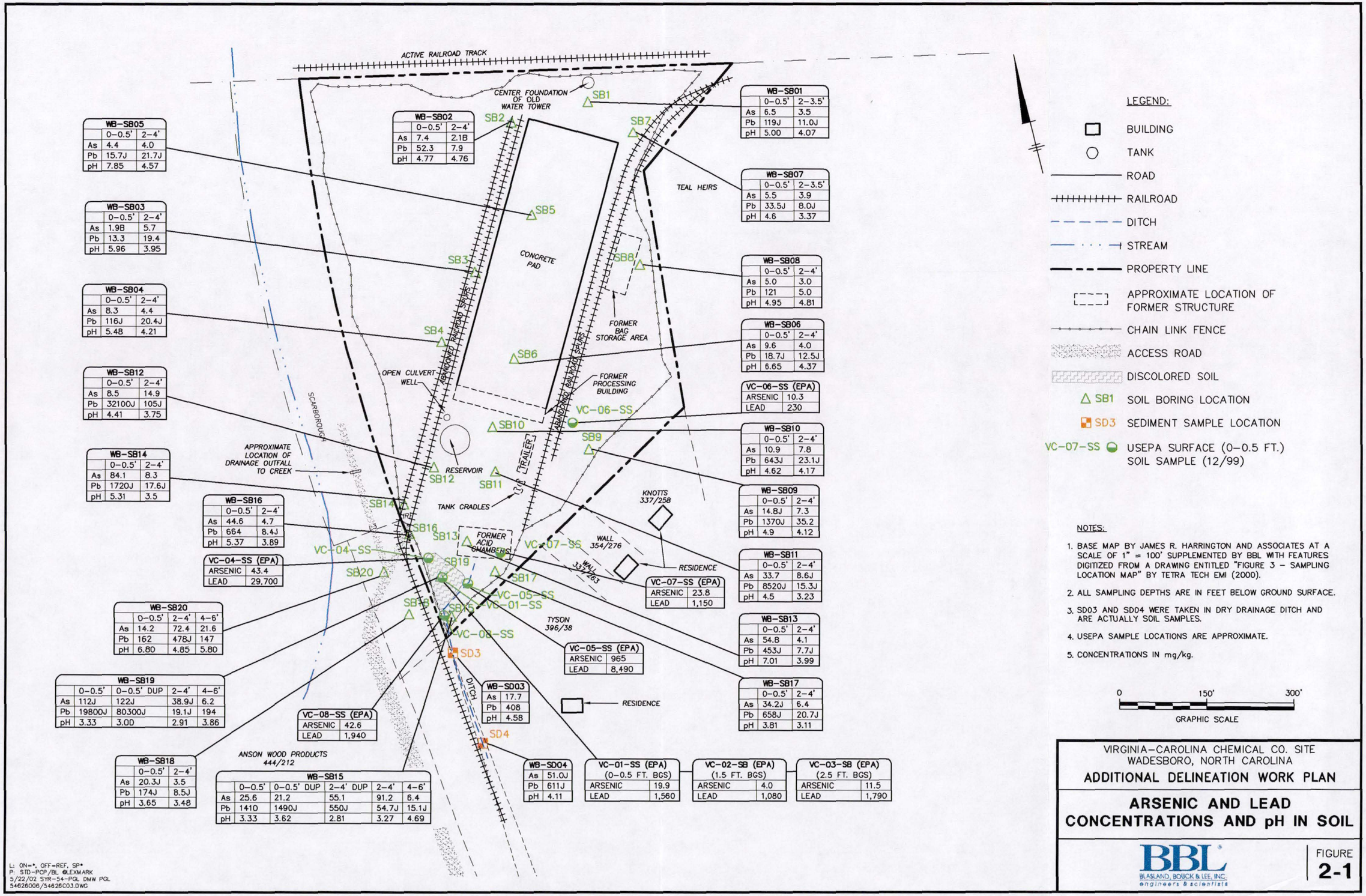
FIGURE 1-1

04/01/02 SYR-D54-LBR
54626003/54626n01.cdr



WB-SB01	0-0.5'	2-3.5'
As	6.5	3.5
Pb	119J	11.0J
pH	5.00	4.07

WB-SB02	0-0.5'	2-4'
As	7.4	2.1B
Pb	52.3	7.9
pH	4.77	4.76

WB-SB03	0-0.5'	2-4'
As	1.9B	5.7
Pb	13.3	19.4
pH	5.96	3.95

WB-SB04	0-0.5'	2-4'
As	8.3	4.4
Pb	116J	20.4J
pH	5.48	4.21

WB-SB05	0-0.5'	2-4'
As	4.4	4.0
Pb	15.7J	21.7J
pH	7.85	4.57

WB-SB06	0-0.5'	2-4'
As	9.6	4.0
Pb	18.7J	12.5J
pH	6.65	4.37

WB-SB07	0-0.5'	2-3.5'
As	5.5	3.9
Pb	33.5J	8.0J
pH	4.6	3.37

WB-SB08	0-0.5'	2-4'
As	5.0	3.0
Pb	121	5.0
pH	4.95	4.81

WB-SB09	0-0.5'	2-4'
As	14.8J	7.3
Pb	1370J	35.2
pH	4.9	4.12

WB-SB10	0-0.5'	2-4'
As	10.9	7.8
Pb	643J	23.1J
pH	4.62	4.17

WB-SB11	0-0.5'	2-4'
As	33.7	8.6J
Pb	8520J	15.3J
pH	4.5	3.23

WB-SB12	0-0.5'	2-4'
As	8.5	14.9
Pb	32100J	105J
pH	4.41	3.75

WB-SB13	0-0.5'	2-4'
As	54.8	4.1
Pb	453J	7.7J
pH	7.01	3.99

WB-SB14	0-0.5'	2-4'
As	84.1	8.3
Pb	1720J	17.6J
pH	5.31	3.5

WB-SB16	0-0.5'	2-4'
As	44.6	4.7
Pb	664	8.4J
pH	5.37	3.89

WB-SB17	0-0.5'	2-4'
As	34.2J	6.4
Pb	658J	20.7J
pH	3.81	3.11

WB-SB18	0-0.5'	2-4'
As	20.3J	3.5
Pb	174J	8.5J
pH	3.65	3.48

WB-SB19	0-0.5'	0-0.5' DUP	2-4'	4-6'
As	112J	122J	38.9J	6.2
Pb	19800J	80300J	19.1J	194
pH	3.33	3.00	2.91	3.86

WB-SB20	0-0.5'	2-4'	4-6'
As	14.2	72.4	21.6
Pb	162	478J	147
pH	6.80	4.85	5.80

WB-SB15	0-0.5'	0-0.5' DUP	2-4' DUP	2-4'	4-6'
As	25.6	21.2	55.1	91.2	6.4
Pb	1410	1490J	550J	54.7J	15.1J
pH	3.33	3.62	2.81	3.27	4.69

VC-06-SS (EPA)	
ARSENIC	10.3
LEAD	230

VC-04-SS (EPA)	
ARSENIC	43.4
LEAD	29,700

VC-07-SS (EPA)	
ARSENIC	23.8
LEAD	1,150

VC-05-SS (EPA)	
ARSENIC	965
LEAD	8,490

VC-08-SS (EPA)	
ARSENIC	42.6
LEAD	1,940

WB-SD03	
As	17.7
Pb	408
pH	4.58

WB-SD04	
As	51.0J
Pb	611J
pH	4.11

VC-01-SS (EPA) (0-0.5 FT. BGS)	
ARSENIC	19.9
LEAD	1,560

VC-02-SB (EPA) (1.5 FT. BGS)	
ARSENIC	4.0
LEAD	1,080

VC-03-SB (EPA) (2.5 FT. BGS)	
ARSENIC	11.5
LEAD	1,790

NOTES:

1. BASE MAP BY JAMES R. HARRINGTON AND ASSOCIATES AT A SCALE OF 1" = 100' SUPPLEMENTED BY BBL WITH FEATURES DIGITIZED FROM A DRAWING ENTITLED "FIGURE 3 – SAMPLING LOCATION MAP" BY TETRA TECH EMI (2000).
2. ALL SAMPLING DEPTHS ARE IN FEET BELOW GROUND SURFACE.
3. SD03 AND SD04 WERE TAKEN IN DRY DRAINAGE DITCH AND ARE ACTUALLY SOIL SAMPLES.
4. USEPA SAMPLE LOCATIONS ARE APPROXIMATE.
5. CONCENTRATIONS IN mg/kg.

VIRGINIA-CAROLINA CHEMICAL CO. SITE
WADESBORO, NORTH CAROLINA

ADDITIONAL DELINEATION WORK PLAN

ARSENIC AND LEAD CONCENTRATIONS AND pH IN SOIL

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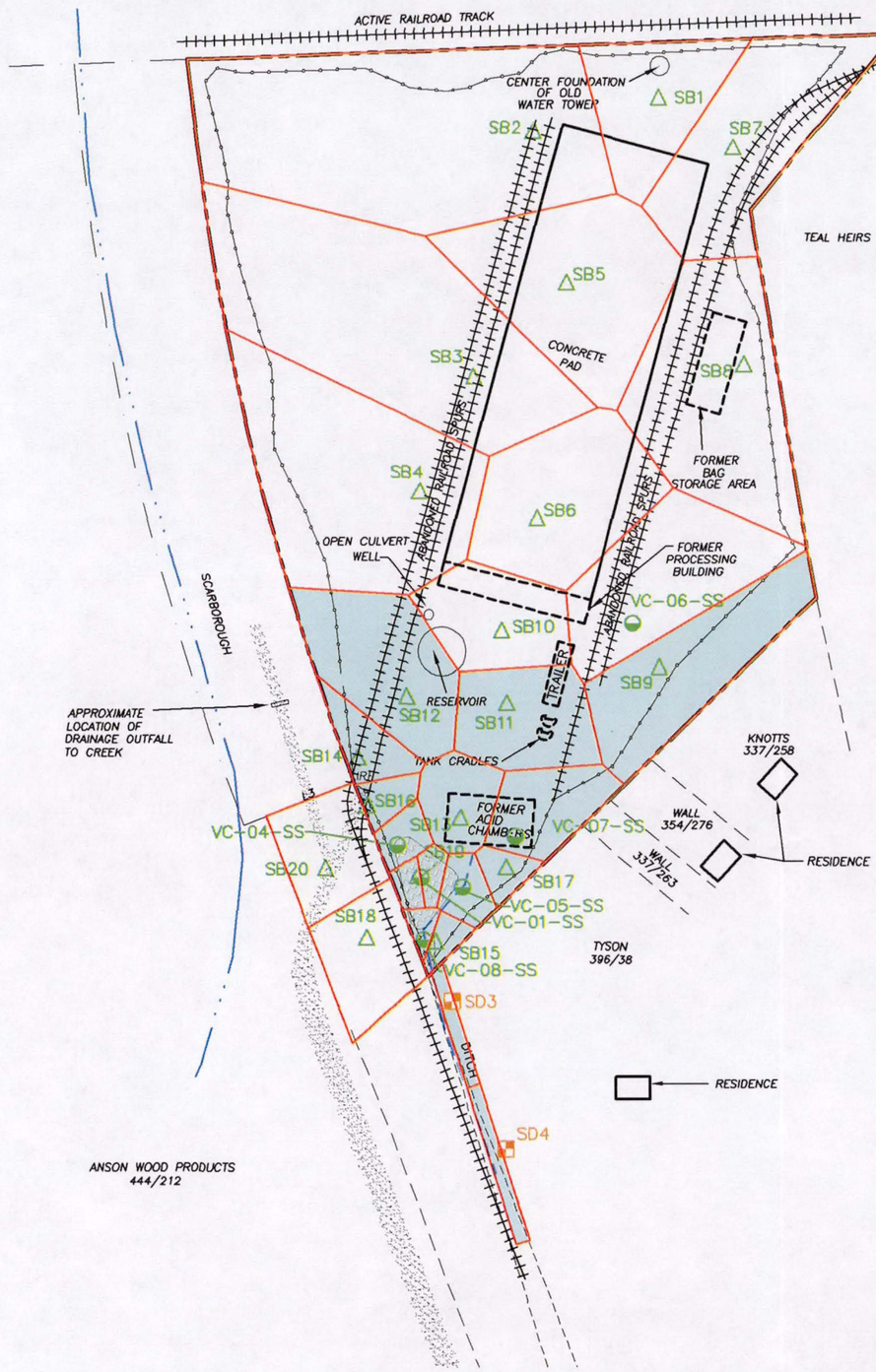
FIGURE 2-1

L: ON=*, OFF=REF, SP*
P: STD-PCP/BL @LEXMARK
5/22/02 SYR-54-PGL DMW PGL
54626006/54626C03.DWG



LEGEND:

- BUILDING
- TANK
- ROAD
- RAILROAD
- DITCH
- STREAM
- PROPERTY LINE
- APPROXIMATE LOCATION OF FORMER STRUCTURE
- CHAIN LINK FENCE
- ACCESS ROAD
- DISCOLORED SOIL
- SB1 SOIL BORING LOCATION
- SD1 SEDIMENT SAMPLE LOCATION
- VC-07-SS USEPA SURFACE (0-0.5 FT.) SOIL SAMPLE (12/99)
- HORIZONTAL LIMITS OF AREA ASSOCIATE WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- POLYGONS THAT EXCEED SITE-SPECIFIC ACTION LEVELS

NOTE:

BASE MAP BY JAMES R. HARRINGTON AND ASSOCIATES AT A SCALE OF 1" = 100' SUPPLEMENTED BY BBL WITH FEATURES DIGITIZED FROM A DRAWING ENTITLED "FIGURE 3 - SAMPLING LOCATION MAP" BY TETRA TECH EMI (2000).

0 150' 300'

GRAPHIC SCALE

VIRGINIA-CAROLINA CHEMICAL CO. SITE
WADESBORO, NORTH CAROLINA

ADDITIONAL DELINEATION WORK PLAN

SURFACE SOIL POLYGONS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE **2-2**

X: NONE
L: ON=*, OFF=REF, SP*
P: PAGESET/BL
5/29/02 SYR-54-PGL DMW PGL
54626007/54626B12.DWG

LEGEND:

- BUILDING
- TANK
- ROAD
- RAILROAD
- DITCH
- STREAM
- PROPERTY LINE
- APPROXIMATE LOCATION OF FORMER STRUCTURE
- CHAIN LINK FENCE
- ACCESS ROAD
- DISCOLORED SOIL
- SB1 SOIL BORING LOCATION
- SD1 SEDIMENT SAMPLE LOCATION
- VC-07-SS USEPA SURFACE (0-0.5 FT.) SOIL SAMPLE (12/99)
- HORIZONTAL LIMITS OF AREA ASSOCIATE WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- POLYGONS THAT EXCEED SITE-SPECIFIC ACTION LEVELS

NOTE:

BASE MAP BY JAMES R. HARRINGTON AND ASSOCIATES AT A SCALE OF 1" = 100' SUPPLEMENTED BY BBL WITH FEATURES DIGITIZED FROM A DRAWING ENTITLED "FIGURE 3 – SAMPLING LOCATION MAP" BY TETRA TECH EMI (2000).

0 150' 300'

GRAPHIC SCALE

VIRGINIA-CAROLINA CHEMICAL CO. SITE
WADESBORO, NORTH CAROLINA

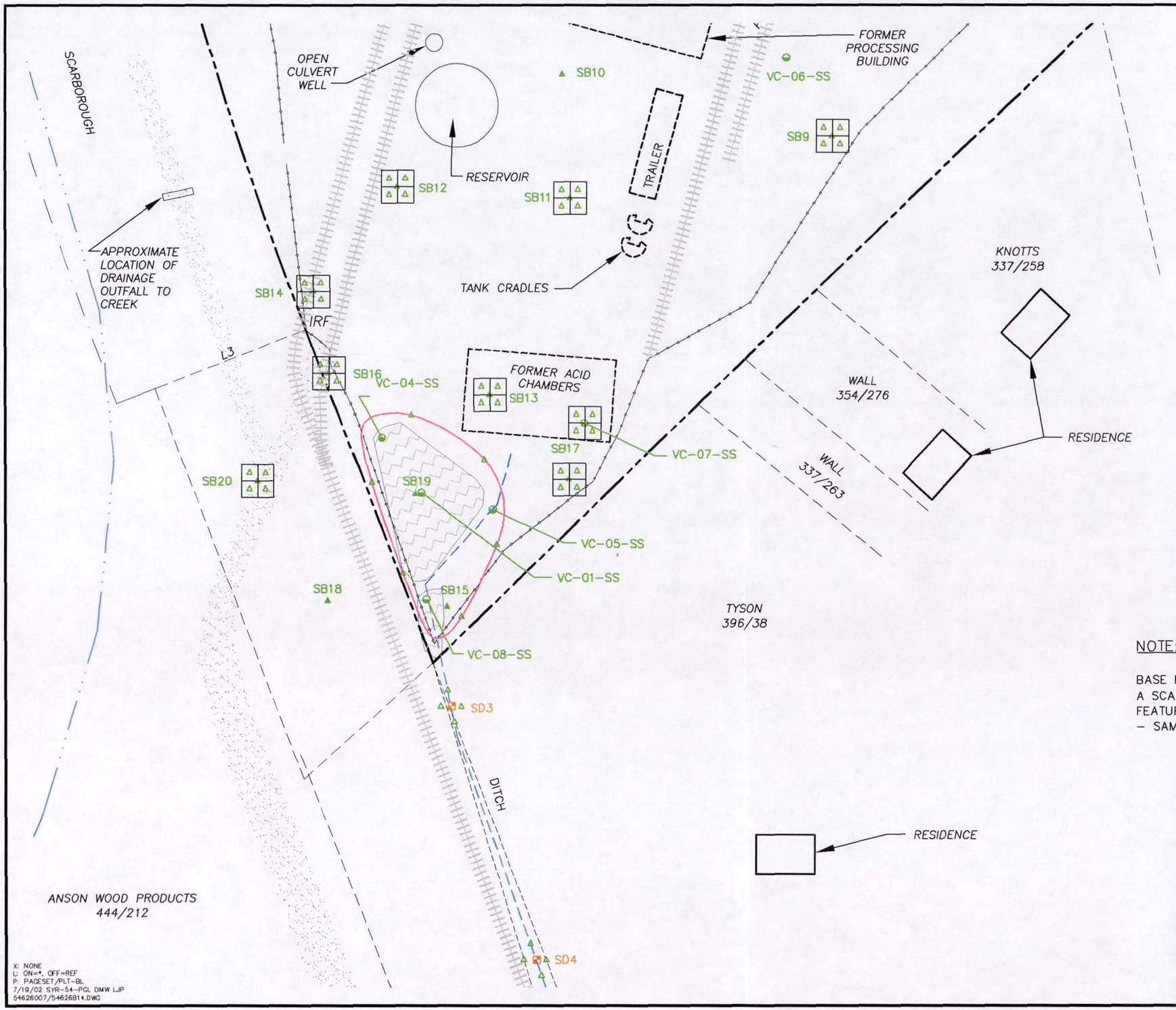
ADDITIONAL DELINEATION WORK PLAN

SUBSURFACE SOIL POLYGONS

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
2-3

X: NONE
L: ON=*, OFF=REF, SP*
P: PAGESET/BL
5/29/02 SYR-54-PGL DMW PGL
54626007/54626B1.3.DWG



X: NONE
L: ON=*, OFF=REF
P: PAGESET/PLT-BL
7/19/02 SYR-54-PGL DMW LJP
54626007/54626B14.DWG

LEGEND:

- BUILDING
- TANK
- ROAD
- RAILROAD
- DITCH
- STREAM
- PROPERTY LINE
- APPROXIMATE LOCATION OF FORMER STRUCTURE
- CHAIN LINK FENCE
- ACCESS ROAD
- DISCOLORED SOIL
- SB1 EXISTING SOIL BORING LOCATION
- PROPOSED SOIL BORING LOCATION
- SD1 EXISTING SEDIMENT SAMPLE LOCATION
- VC-07-SS USEPA SURFACE (0-0.5 FT.) SOIL SAMPLE (12/99)
- PROPOSED LOCATION OF VISUAL DELINEATION TRENCH (APPROXIMATE)
- APPROXIMATE LOCATION OF 10-FOOT GRID PATTERN

NOTE:

BASE MAP BY JAMES R. HARRINGTON AND ASSOCIATES AT A SCALE OF 1" = 100' SUPPLEMENTED BY BBL WITH FEATURES DIGITIZED FROM A DRAWING ENTITLED "FIGURE 3 – SAMPLING LOCATION MAP" BY TETRA TECH EMI (2000).

0 60' 120'
GRAPHIC SCALE

VIRGINIA-CAROLINA CHEMICAL CO. SITE
WADESBORO, NORTH CAROLINA

ADDITIONAL DELINEATION WORK PLAN

PROPOSED ADDITIONAL DELINEATION LOCATIONS

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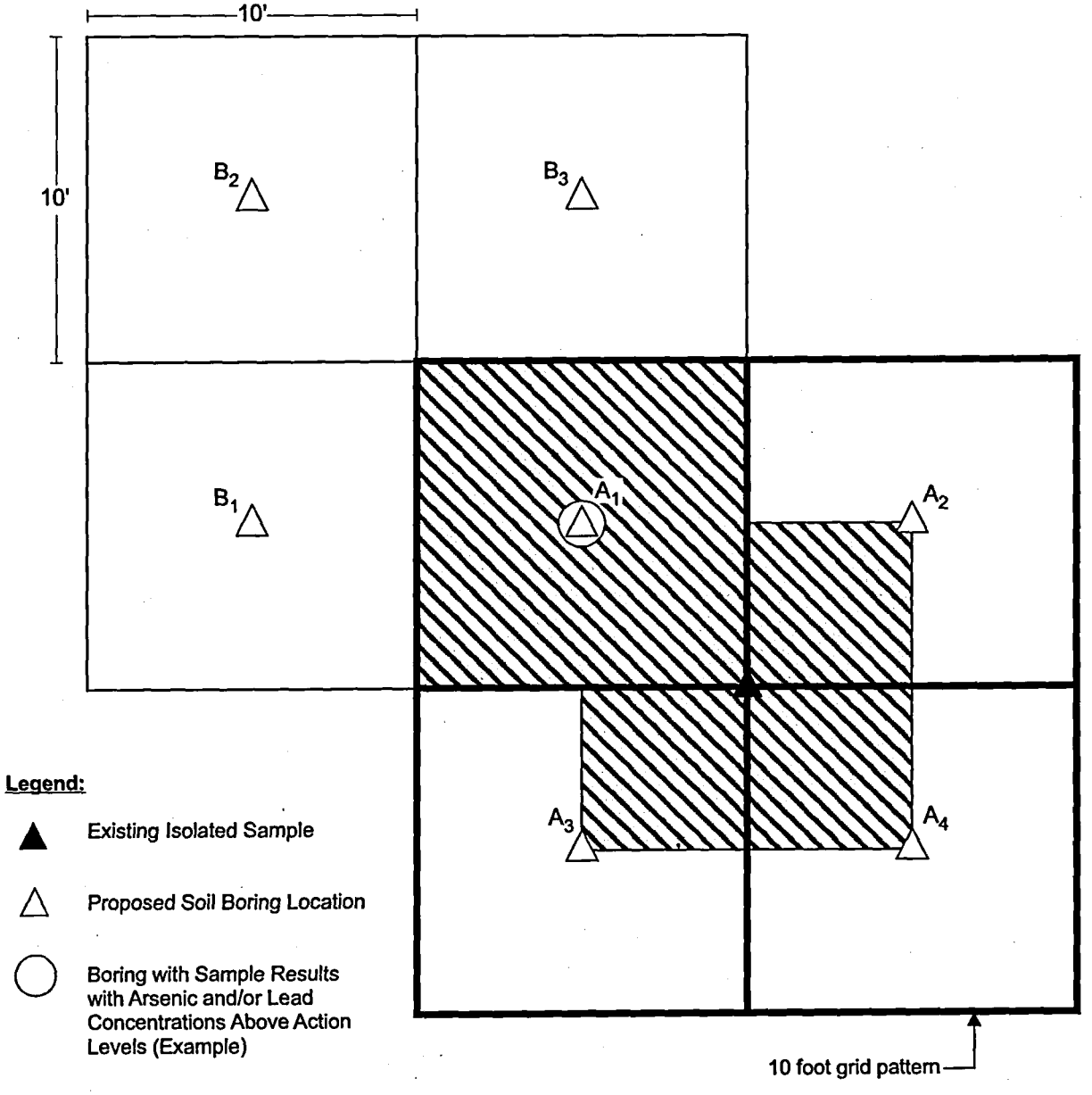
FIGURE
2-4



Legend:

- ▲ Existing Isolated Sample
- △ Proposed Soil Boring Location
- ○ Boring with Sample Results with Arsenic and/or Lead Concentrations Above Action Levels (Example)
- ▨ Area to be Remediated

5' 0 5'

Approximate Graphic Scale: 1" = 5'

VIRGINIA-CAROLINA CHEMICAL CO. SITE
WADESBORO, NORTH CAROLINA
ADDITIONAL DELINEATION WORK PLAN

EXAMPLE OF ISOLATED AREAS SOIL DELINEATION PATTERN

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FIGURE
2-5

07/18/02 SYR-D54-DJH
54626009/54626g01.cdr