4.0 NATURE AND EXTENT OF CONTAMINATION

This chapter presents results of the Phase II RI data screening to identify contaminants indicative of AOC operations. Constituents deemed as related to AOC operations are classified as SRCs. Theses SRCs are then evaluated to determine their occurrence and distribution in environmental media at Load Line 3. Section 4.1 of this chapter presents the statistical methods and screening criteria used to reduce and display data and to distinguish naturally occurring constituents from SRCs indicative of historical site operations. Sections 4.2 through 4.6 present the nature and extent of identified SRCs in each environmental media (surface soil, subsurface soil, sediment, surface water, and groundwater) characterized.

For the purposes of this Phase II RI report, data aggregates were established based on environmental media (surface soil, subsurface soil, sediment, surface water, and groundwater) and site operational history and physical characteristics (spatial aggregates). These data aggregates form the basis for EUs addressed in the human health and ecological risk evaluations (Chapters 6.0 and 7.0, respectively). Section 4.7 addresses analytical results from the sanitary sewer system characterization. Section 4.8 addresses special samples of soil, sediments, sludges, water, and debris materials (floor sweepings) collected beneath and within buildings and structures.

A summary of the results of the OE avoidance activities is presented in Section 4.9. A brief summary of a radiological survey of former radiography facilities by USACE is presented in Section 4.10. Field measurements of explosives are compared with their respective laboratory measurements in Section 4.11. Section 4.12 provides a summary of the results of the contaminant nature and extent evaluation.

4.1 DATA EVALUATION METHODS

The evaluation of Load Line 3 Phase II RI analytical data for each environmental medium involved four general steps: (1) defining background concentrations, (2) defining data aggregates, (3) performing data reduction and screening, and (4) presenting data.

4.1.1 Site Chemical Background

Chemicals occur naturally in soils, sediments, surface water, and groundwater. The natural levels of chemicals – called background levels – must be known in order to determine whether the concentrations measured at Load Line 3 are higher than would be expected if the load line operations had not occurred. Facility-wide background values for inorganic constituents in soil, sediment, surface water, and groundwater were developed as part of a previous Phase II RI at the WBG at RVAAP (USACE 2001c). Although some organic compounds also occur under ambient conditions (i.e., some PAHs), the organic compounds of primary concern (e.g., explosives) are man-made; therefore, background for all organic compounds was set to zero, and any detected concentration of these compounds is considered as being above background.

For each environmental medium of interest, a RVAAP facility-wide background level was calculated for each inorganic constituent detected in the background sample population. The background level for a specific constituent is the lower of the maximum detected value in the background dataset (for non-normal distributed data) or the 95% upper tolerance limit of the 95th percentile of the distribution of background concentrations (for normally distributed or log-normally distributed data). For all inorganics detected in the background dataset, the background value selected was the maximum detected value. If the measured concentration for an inorganic constituent at an AOC exceeds its background value, it is likely that the concentration is elevated due to processes or operations that took place within that AOC.

The background criteria were set to zero for inorganics that were not detected in the facility-wide background samples. For metals that were not detected in the background samples, any detected result from Load Line 3 was considered above background. RVAAP facility-wide background criteria for each medium are listed in Table 4-1.

4.1.2 Definition of Aggregates

The Load Line 3 Phase II RI data were grouped (aggregated) in two ways for evaluation of contaminant nature and extent and to form the basis for EUs in the SHHRA and the screening ecological risk assessment (SERA). The initial aggregation of data is by environmental media (soil, sediment, surface water, and groundwater) to facilitate evaluation of contaminant nature and extent and risks. Data for the soil medium were further aggregated on the basis of depth for consistency with the baseline human health risk assessment (BHHRA) and EPA risk assessment guidance: surface soil from 0 to 0.3 m (0 to 1 ft) and subsurface soil greater than a depth of 0.3 m (1 ft). For each of the media aggregates, an evaluation was conducted to determine if further aggregation was warranted on the basis of site characteristics, historical operations, ecological habitat, and potential future remedial strategy and land use (spatial aggregates).

Soil and Dry Sediment Aggregates

Using the above data aggregation criteria, surface soil and subsurface soil within the geographic area of Load Line 3 were separated into seven aggregates (Table 4-2). The first five soil aggregates (Explosives Handling Areas, Preparation and Receiving Areas, Packaging and Shipping Areas, Changes Houses, and DLA Storage Tanks) represent physically separated groupings of operations facilities with fundamentally different functions (Figure 4-1). These five aggregates contain all known or potential primary contaminant source terms and are expected to exhibit substantially different types and levels of contaminants. Intervening land area between the former operational facilities is relegated to a Perimeter Area aggregate, which is expected to exhibit low levels or no contamination. A number of predominantly dry drainage ditches were characterized during the RI. These conveyances contain water only during precipitation events or during snow melt, but represent potential accumulation points for contaminants entrained within historical discharges and runoff from source areas. Accordingly, dry sediment samples were assigned to their respective soil source area aggregate, if the conveyance was within the aggregate boundary. Several dry ditch sediment samples were collected from drainage ditches located to the west of the primary operations facilities, which received runoff from portions of the explosives handling areas and effluent from the sedimentation basins. These samples were assigned to a separate soil aggregate (West Ditches Aggregate), as they are not primary sources and may have accumulated contaminants from a number of sources. (Figure 4-1).

Surface Water Streams and Ponds

Data characterizing the surface drainage system at Load Line 3, inclusive of streams and surface impoundments, were aggregated with respect to likelihood of contaminant accumulation and the potential for human use/contact and viability of ecological habitat. The main stream exiting Load Line 3 (Cobb's Pond Tributary) contains substantial perennial flow and the pond into which the stream flows does not contain former production facilities or other known contaminant source areas. Using these above criteria and site knowledge, surface water and sediment data from Load Line 3 were grouped into one aggregate: the Cobb's Pond Tributary Aggregate.

Table 4-1. RVAPP Facility-Wide Background Criteria

Media Units Analyte	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (µg/L)	Groundwater Bedrock Zone Filtered (µg/L)	Groundwater Bedrock Zone Unfiltered (µg/L)	Groundwater Unconsolidated Zone Filtered (µg/L)	Groundwater Unconsolidated Zone Unfiltered (µg/L)
Cyanide	0	0	0	0	0	0	0	0
Aluminum	17,700	19,500	13,900	3,370	0	9,410	0	48,000
Antimony	0.96	0.96	0	0	0	0	0	4.3
Arsenic	15.4	19.8	19.5	3.2	0	19.1	11.7	215
Barium	88.4	124	123	47.5	256	241	82.1	327
Beryllium	0.88	0.88	0.38	0	0	0	0	0
Cadmium	0	0	0	0	0	0	0	0
Calcium	15,800	35,500	5,510	41,400	53,100	48,200	115,000	194,000
Chromium	17.4	27.2	18.1	0	0	19.5	7.3	85.2
Cobalt	10.4	23.2	9.1	0	0	0	0	46.3
Copper	17.7	32.3	27.6	7.9	0	17	0	289
Iron	23,100	35,200	28,200	2,560	1,430	21,500	279	195,000
Lead	26.1	19.1	27.4	0	0	23	0	183
Magnesium	3,030	8,790	2,760	10,800	15,000	13,700	43,300	58,400
Manganese	1,450	3,030	1,950	391	1,340	1,260	1,020	2,860
Mercury	0.036	0.044	0.059	0	0	0	0	0.25
Nickel	21.1	60.7	17.7	0	83.4	85.3	0	117
Potassium	927	3,350	1,950	3,170	5,770	6,060	2,890	7,480
Selenium	1.4	1.5	1.7	0	0	0	0	5.7
Silver	0	0	0	0	0	0	0	0
Sodium	123	145	112	21,300	51,400	49,700	45,700	44,700
Thallium	0	0.91	0.89	0	0	0	0	2.4
Vanadium	31.1	37.6	26.1	0	0	15.5	0	98.1
Zinc	61.8	93.3	532	42	52.3	193	60.9	888

RVAAP = Ravenna Army Ammunition Plant.

Table 4-2. Data Aggregates/Exposure Units for the Load Line 3 Phase II RI

Aggregate/Exposure Unit Name	Aggregate/Exposure Unit Basis
Surface and Subsurface Soil	
Explosives Handling Areas	Includes major explosives handling and processing facilities: Buildings EB-4, EB-4A, EA-6, EA-6A, EB-10, and adjacent soils
Preparation and Receiving Areas	Includes Buildings EB-3 and EB-803, and the powerhouse
Packaging and Shipping Areas	Includes Buildings EB-138, EB-13, and EB-11
Change Houses	Includes Buildings EB-8, EB-8A, and EB-22A. Separated from perimeter areas for consistency of risk evaluations
Perimeter Area	Intervening land areas between source area aggregates
DLA Storage Tanks	Includes areas associated with the storage tank farm in the southeast portion of the site
West Ditches	Dry sediments from drainage ditches west of process and operations buildings. Potential accumulated contaminants not related to a specific source area
Sediment and Surface Water	
Cobb's Pond Tributary	Viable habitat, downstream of primary contaminant source areas
Miscellaneous Surface Water	Water from non-viable habitat areas (intermittent flow drainage ditches, etc.). Associated sediment samples are addressed as soil
Groundwater	
Groundwater	All shallow groundwater within AOC
Storm and Sanitary Sewers [a]	
Storm and Sanitary Sewer Sediment	All sediment accumulated within storm and sanitary sewer system
Storm and Sanitary Sewer Water	All water accumulated within storm and sanitary sewer system
Buildings and Structures [a]	
Buildings and Structures	Soil beneath floor slabs; sediment/sludge, and water from within sedimentation basins and washout basins; and floor sweep samples

[a] Samples from storm and sanitary sewers and buildings and structures were evaluated for nature and extent determination only and were not evaluated under the conventional risk exposure scenarios applied to other environmental media.
AOC = Area of Concern.
DLA = Defense Logistics Agency.

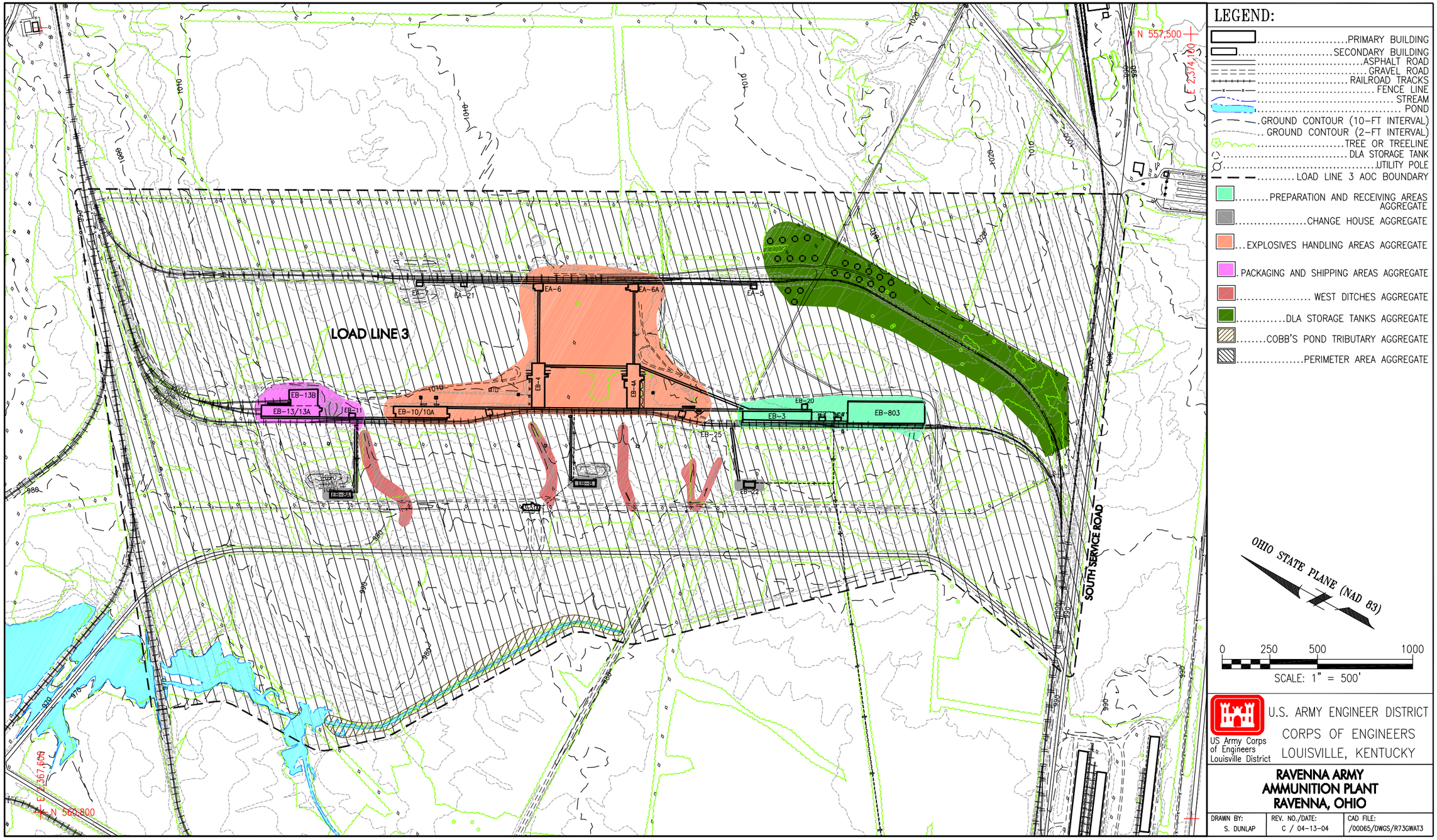


Figure 4-1. Spatial Aggregates for the Load Line 3 Phase II RI

These two segments were distinguished on the basis of potential for accumulated contamination and the consequent impacts on future risk management and remedial decisions. The Cobb's Pond Tributary, which lies down-stream of the major source areas at Load Line 3, was deemed the most likely to contain accumulated contaminants and are more extensive ecological habitat; thus, they were considered as a separate aggregate.

A miscellaneous water sample was collected from a standing pool containing intermittent flow. This sample does not represent viable ecological habitat nor does it represent conditions within Load Line 3, and it is termed as a Miscellaneous Water Aggregate.

Groundwater

For this Phase II RI, groundwater media were not subdivided into spatial aggregates. No monitoring wells were installed during the Phase I RI. All of the monitoring wells installed during the Phase II RI monitor the water table interval within the consolidated interval. Accordingly, no technical basis existed for aggregation at this point in the CERCLA process.

Storm and Sanitary Sewers

The storm and sanitary sewer systems sampled during the Phase II RI represent potential accumulation points, as well as potential migration pathways throughout the load line. Additionally, sediments and water within the utility system are not evaluated under the conventional risk exposure scenarios applied to other environmental media within the load line (e.g., soil, surface water, stream sediment, or groundwater). Because of these considerations, the utility systems are evaluated in the nature and extent assessment as a separate aggregate.

Buildings and Structures

Samples of soil beneath building floor slabs, accumulated sediment/sludge and water within sedimentation and washout basins, and accumulated debris on floor surfaces (floor sweep samples) are considered as a separate data aggregate from other environmental media. These samples were collected primarily to support future building demolition activities (e.g., to identify waste management and safety issues). As with storm and sanitary sewer systems, these data are not evaluated under the conventional risk scenarios applied to other environmental media.

4.1.3 Data Reduction and Screening

4.1.3.1 Data reduction

More than 270 environmental soil, sediment, surface water, groundwater, and field QC samples were collected with approximately 25,500 discrete laboratory analyses (i.e., analytes) being obtained, reviewed, and integrated into this RI. These totals do not include field measurements and field descriptions. Analytical results were reported by the laboratory in electronic format and loaded into a database. As discussed in Section 3.6, verification of data was performed to ensure that all requested data were received and complete. Data use qualifiers were assigned to each result based on the laboratory QA review and verification criteria. Results were qualified as follows:

"U" Not detected.
"UJ" Not detected, detection limit estimated.
"J" Estimated concentration less than method reporting limits.
"R" Rejected results.
"=" Analyte present and concentration accurate.

In addition to assigning qualifiers, the verification process also selected the appropriate results to use when re-analysis or dilutions were performed. Where laboratory surrogate recovery data or laboratory QC samples were outside of analytical method specifications, a determination was made regarding whether laboratory re-analysis should be used in place of an original reported result. If results were reported for both diluted and undiluted samples, results from the diluted sample were used only for those analytes that exceeded the calibration range of the undiluted sample. A complete discussion of the results of the verification process is contained in the Data Quality Assessment Report (Appendix H). Independent validation of 10% of the Phase II RI data and 100% of the USACE QA laboratory data was performed by a third-party subcontractor to the USACE, Louisville District. Additional qualification of the Phase II RI data may be required based on the results of the validation process.

The data reduction process employed to identify SRCs involved first calculating data summary statistics. Site data were extracted from the database such that QC splits and field duplicates were excluded from the screening datasets. Rejected results were excluded from the screening process. All analytes having at least one detected value were included in the data reduction process. Summary statistics calculated for each data aggregate (Tables 4-3 through 4-10) included the minimum, maximum, and average (mean) detected values and the proportion of detected results to the total number of samples collected. Non-detected results meeting contract-required detection limits were set to one-half of the reported detection limit during calculation of the mean result for each compound. Non-detected results with elevated detection limits (more than 5 times the contract-required detection limit) were excluded from the summary statistics in order not to skew the calculation of mean values.

Following data reduction, the data were screened to identify SRCs using the processes outlined in the following sections. Additional screening of identified SRCs was conducted as part of the fate and transport evaluation to identify contaminant migration constituents of potential concern (CMCOPCs) and as part of the risk assessments to identify human health and ecological chemicals of potential concern (COPCs) (see Chapters 6.0 and 7.0).

4.1.3.2 Frequency of detection screen

For sample aggregates containing more than 20 samples, a frequency of detection criterion was applied to identify SRCs. Inorganic constituents, VOCs, SVOCs, pesticides, and PCBs with a frequency of detection greater than or equal to 5% (e.g., 1 in 20 samples) were identified as SRCs. Inorganics are not determined to be SRCs based solely on the frequency of detection screen. If the frequency of detection for one of these classes of analytes was less than 5%, a weight of evidence (WOE) approach was used to determine if the chemical was a SRC. The WOE approach involved examining the magnitude and locations of the detected results. If no clustering within a particular area was noted and concentrations were not substantially elevated relative to the detection limits, the detected results were considered spurious, and the compound was eliminated as an SRC. If an aggregate had a sample population of less than 20 samples, all detected constituents were carried forward to the facility-wide background and essential human nutrient screening steps.

All detected explosives and propellants were considered to be SRCs regardless of the frequency of detection and, thus, were subjected to the risk evaluation (Chapters 6.0 and 7.0). However, assessment of occurrence and distribution for those explosives and propellants having a frequency of detection less than 5% includes qualification that they were infrequently detected.

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Change Houses Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	6/ 6	1.0E+04	1.9E+04	1.3E+04	L	1.8E+04	Yes	Above background
Arsenic	6/ 6	5.3E+00	1.5E+01	9.2E+00	N	1.5E+01	No	Below background
Barium	6/ 6	5.7E+01	2.1E+02	1.2E+02	L	8.8E+01	Yes	Above background
Beryllium	6/ 6	5.2E-01	2.9E+00	1.4E+00	L	8.8E-01	Yes	Above background
Cadmium	6/ 6	2.1E-01	1.0E+00	4.7E-01	L	0	Yes	Above background
Calcium	6/ 6	1.3E+03	1.2E+05	5.4E+04	L	1.6E+04	No	Essential element
Chromium	6/ 6	1.2E+01	1.9E+01	1.5E+01	L	1.7E+01	Yes	Above background
Cobalt	6/ 6	2.2E+00	1.1E+01	6.6E+00	N	1.0E+01	Yes	Above background
Copper	6/ 6	6.4E+00	2.2E+01	1.4E+01	N	1.8E+01	Yes	Above background
Iron	6/ 6	6.8E+03	2.7E+04	1.7E+04	N	2.3E+04	No	Essential element
Lead	6/ 6	1.8E+01	1.8E+02	5.8E+01	L	2.6E+01	Yes	Above background
Magnesium	6/ 6	1.8E+03	1.2E+04	6.3E+03	L	3.0E+03	No	Essential element
Manganese	6/ 6	5.0E+02	2.4E+03	1.3E+03	N	1.5E+03	Yes	Above background
Mercury	6/ 6	1.2E-02	7.4E-02	3.6E-02	L	3.6E-02	Yes	Above background
Nickel	6/ 6	5.9E+00	2.3E+01	1.3E+01	N	2.1E+01	Yes	Above background
Potassium	6/ 6	8.6E+02	1.5E+03	1.1E+03	L	9.3E+02	No	Essential element
Selenium	5/ 6	3.7E-01	7.4E-01	6.3E-01	L	1.4E+00	No	Below background
Silver	1/ 6	8.7E+00	8.7E+00	1.7E+00	D	0	Yes	Above background
Sodium	3/ 6	2.4E+02	5.2E+02	3.5E+02	L	1.2E+02	No	Essential element
Thallium	6/ 6	1.9E-01	3.4E-01	2.7E-01	L	0	Yes	Above background
Vanadium	6/ 6	7.2E+00	2.5E+01	1.5E+01	L	3.1E+01	No	Below background
Zinc	6/ 6	4.6E+01	9.5E+01	6.5E+01	L	6.2E+01	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
PCB-1254	4/ 6	1.5E-01	6.3E+00	1.2E+00	L	0	Yes	Above background
DLA Tanks Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	19/ 19	8.7E+03	1.6E+04	1.2E+04	L	1.8E+04	No	Below background
Antimony	13/ 19	9.2E-01	8.3E+02	5.6E+01	X	9.6E-01	Yes	Above background
Arsenic	19/ 19	7.4E+00	1.6E+01	1.1E+01	N	1.5E+01	Yes	Above background
Barium	19/ 19	4.9E+01	1.9E+02	9.9E+01	L	8.8E+01	Yes	Above background
Beryllium	19/ 19	5.3E-01	1.7E+00	8.4E-01	X	8.8E-01	Yes	Above background
Cadmium	12/ 19	9.9E-02	3.2E+00	3.7E-01	L	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Calcium	19/ 19	5.1E+02	5.7E+04	1.2E+04	L	1.6E+04	No	Essential element
Chromium	19/ 19	1.1E+01	1.2E+02	2.0E+01	X	1.7E+01	Yes	Above background
Cobalt	19/ 19	5.1E+00	1.2E+01	7.9E+00	L	1.0E+01	Yes	Above background
Copper	19/ 19	6.4E+00	3.1E+01	1.3E+01	L	1.8E+01	Yes	Above background
Iron	19/ 19	1.4E+04	2.8E+04	2.2E+04	N	2.3E+04	No	Essential element
Lead	19/ 19	1.2E+01	1.5E+03	1.5E+02	X	2.6E+01	Yes	Above background
Magnesium	19/ 19	1.3E+03	9.1E+03	3.2E+03	L	3.0E+03	No	Essential element
Manganese	19/ 19	2.2E+02	2.5E+03	1.0E+03	N	1.5E+03	Yes	Above background
Mercury	16/ 19	1.4E-02	1.0E-01	4.6E-02	L	3.6E-02	Yes	Above background
Nickel	19/ 19	8.3E+00	2.5E+01	1.4E+01	L	2.1E+01	Yes	Above background
Potassium	19/ 19	4.0E+02	9.7E+02	6.8E+02	N	9.3E+02	No	Essential element
Selenium	4/ 19	3.8E-01	1.6E+00	9.3E-01	D	1.4E+00	Yes	Above background
Sodium	6/ 19	7.5E+01	2.6E+02	2.4E+02	D	1.2E+02	No	Essential element
Thallium	6/ 19	3.0E-01	2.7E+00	3.5E-01	D	0	Yes	Above background
Vanadium	19/ 19	1.1E+01	2.9E+01	2.1E+01	N	3.1E+01	No	Below background
Zinc	19/ 19	3.6E+01	2.3E+02	6.8E+01	X	6.2E+01	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
Dieldrin	1/ 5	9.4E-03	9.4E-03	5.0E-03	D	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/kg)								
Benz(*a*)anthracene	1/ 5	8.2E-02	8.2E-02	1.7E-01	D	0	Yes	Above background
Benzo(*a*)pyrene	1/ 5	5.4E-02	5.4E-02	1.6E-01	D	0	Yes	Above background
Benzo(*b*)fluoranthene	2/ 5	5.4E-02	7.9E-02	1.4E-01	D	0	Yes	Above background
Benzo(*k*)fluoranthene	1/ 5	5.0E-02	5.0E-02	1.6E-01	D	0	Yes	Above background
Chrysene	2/ 5	7.5E-02	8.3E-02	1.4E-01	D	0	Yes	Above background
Fluoranthene	2/ 5	7.3E-02	1.3E-01	1.5E-01	D	0	Yes	Above background
Phenanthrene	1/ 5	7.4E-02	7.4E-02	1.7E-01	D	0	Yes	Above background
Pyrene	2/ 5	8.0E-02	8.9E-02	1.5E-01	D	0	Yes	Above background
Explosives Handling Areas Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	108/ 108	2.5E+03	3.5E+04	9.0E+03	X	1.8E+04	Yes	Above background
Antimony	13/ 78	5.1E-01	1.6E+02	2.8E+00	D	9.6E-01	Yes	Above background
Arsenic	107/ 108	4.5E+00	3.4E+01	1.3E+01	X	1.5E+01	Yes	Above background
Barium	108/ 108	1.6E+01	1.3E+03	1.2E+02	X	8.8E+01	Yes	Above background
Beryllium	74/ 78	2.6E-01	4.6E+00	7.7E-01	X	8.8E-01	Yes	Above background
Cadmium	105/ 107	6.0E-02	2.9E+01	1.4E+00	X	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Calcium	78/ 78	5.1E+02	2.0E+05	1.3E+04	X	1.6E+04	No	Essential element
Chromium	108/ 108	4.9E+00	3.2E+02	2.2E+01	X	1.7E+01	Yes	Above background
Chromium, hexavalent	1/ 1	1.1E+00	1.1E+00	1.1E+00	X	0	Yes	Above background
Cobalt	78/ 78	1.9E+00	2.9E+01	9.1E+00	X	1.0E+01	Yes	Above background
Copper	78/ 78	3.3E+00	3.0E+02	2.8E+01	X	1.8E+01	Yes	Above background
Cyanide	5/ 14	1.6E-01	3.8E-01	2.8E-01	D	0	Yes	Above background
Iron	78/ 78	8.1E+03	1.8E+05	2.3E+04	X	2.3E+04	No	Essential element
Lead	108/ 108	3.6E+00	2.6E+03	1.2E+02	X	2.6E+01	Yes	Above background
Magnesium	78/ 78	7.8E+02	2.7E+04	3.2E+03	X	3.0E+03	No	Essential element
Manganese	108/ 108	7.5E+01	4.8E+03	7.8E+02	X	1.5E+03	Yes	Above background
Mercury	64/ 108	1.1E-02	2.4E-01	3.7E-02	X	3.6E-02	Yes	Above background
Nickel	77/ 78	3.1E+00	7.7E+01	1.9E+01	X	2.1E+01	Yes	Above background
Potassium	78/ 78	2.7E+02	1.3E+03	7.3E+02	N	9.3E+02	No	Essential element
Selenium	72/ 108	3.5E-01	4.1E+00	9.3E-01	X	1.4E+00	Yes	Above background
Silver	17/ 108	2.7E-01	4.5E+00	3.5E-01	D	0	Yes	Above background
Sodium	15/ 78	5.3E+01	6.2E+02	2.8E+02	D	1.2E+02	No	Essential element
Thallium	48/ 78	1.6E-01	3.5E+00	4.2E-01	X	0	Yes	Above background
Vanadium	78/ 78	5.9E+00	2.6E+01	1.5E+01	L	3.1E+01	No	Below background
Zinc	107/ 108	2.2E+01	2.8E+03	1.5E+02	X	6.2E+01	Yes	Above background
Organics-Total Organic Carbon (concentration units = mg/kg)								
Total Organic Carbon	1/ 1	5.1E+03	5.1E+03	5.1E+03	X	2.4E+04	No	Below background
Organics-Explosives (concentration units = mg/kg)								
1,3,5-Trinitrobenzene	18/ 70	1.1E-01	1.1E+02	2.5E+00	D	0	Yes	Above background
1,3-Dinitrobenzene	1/ 70	4.7E+00	4.7E+00	9.6E+00	D	0	Yes	Above background
2,4,6-Trinitrotoluene	52/ 70	7.0E-02	3.9E+05	5.9E+03	X	0	Yes	Above background
2,4-Dinitrotoluene	12/ 70	8.3E-02	1.2E+01	9.6E+00	D	0	Yes	Above background
2,6-Dinitrotoluene	3/ 70	1.3E-01	2.3E-01	1.0E+01	D	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	19/ 35	1.9E-01	7.7E+00	2.0E+00	X	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	11/ 35	1.4E-01	6.5E+00	2.1E+01	D	0	Yes	Above background
4-Nitrotoluene	1/ 70	2.2E-01	2.2E-01	9.6E+00	D	0	Yes	Above background
HMX	2/ 70	2.4E+00	1.4E+01	7.4E+01	D	0	Yes	Above background
Nitrocellulose	4/ 8	2.3E+00	5.3E+01	9.5E+00	X	0	Yes	Above background
Nitroguanidine	4/ 8	4.2E-02	1.3E-01	9.8E-02	X	0	Yes	Above background
RDX	2/ 70	1.0E+01	3.4E+01	3.8E+01	D	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
4,4'-DDE	5/ 16	3.8E-03	5.5E-01	5.1E-02	D	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
4,4'-DDT	1/ 16	1.1E-02	1.1E-02	1.5E-02	D	0	Yes	Above background
Dieldrin	3/ 16	4.0E-03	1.2E+00	8.8E-02	D	0	Yes	Above background
Endosulfan II	1/ 16	4.5E-03	4.5E-03	1.4E-02	D	0	Yes	Above background
Endosulfan Sulfate	1/ 16	5.1E-01	5.1E-01	4.3E-02	D	0	Yes	Above background
Endrin	2/ 16	1.0E-02	3.2E+00	2.1E-01	D	0	Yes	Above background
Endrin Aldehyde	3/ 16	5.4E-03	5.1E-01	4.4E-02	D	0	Yes	Above background
Endrin Ketone	1/ 16	1.4E-02	1.4E-02	1.5E-02	D	0	Yes	Above background
Heptachlor	2/ 16	1.1E-02	1.8E-01	2.3E-02	D	0	Yes	Above background
Heptachlor Epoxide	1/ 16	9.4E-02	9.4E-02	2.0E-02	D	0	Yes	Above background
PCB-1254	47/ 71	4.6E-02	1.1E+03	2.2E+01	X	0	Yes	Above background
PCB-1260	6/ 71	7.5E-02	1.4E+00	1.1E+00	D	0	Yes	Above background
alpha-Chlordane	1/ 16	5.9E-01	5.9E-01	5.1E-02	D	0	Yes	Above background
beta-BHC	1/ 16	3.0E-02	3.0E-02	1.6E-02	D	0	Yes	Above background
gamma-Chlordane	4/ 16	4.1E-03	1.4E-01	2.7E-02	D	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/kg)								
2-Methylnaphthalene	5/ 28	4.8E-02	2.5E+00	3.5E-01	D	0	Yes	Above background
Acenaphthene	6/ 28	6.6E-02	1.1E+01	6.9E-01	D	0	Yes	Above background
Acenaphthylene	2/ 28	5.4E-02	5.8E-02	2.9E-01	D	0	Yes	Above background
Anthracene	7/ 28	5.9E-02	2.2E+01	1.2E+00	D	0	Yes	Above background
Benz(*a*)anthracene	12/ 28	3.9E-02	2.9E+01	1.7E+00	D	0	Yes	Above background
Benzo(*a*)pyrene	11/ 28	3.6E-02	2.3E+01	1.5E+00	D	0	Yes	Above background
Benzo(*b*)fluoranthene	16/ 28	3.5E-02	2.9E+01	1.8E+00	X	0	Yes	Above background
Benzo(*g,h,i*)perylene	8/ 28	8.0E-02	1.2E+01	8.6E-01	D	0	Yes	Above background
Benzo(*k*)fluoranthene	11/ 28	3.8E-02	1.6E+01	1.1E+00	D	0	Yes	Above background
Bis(2-ethylhexyl)phthalate	6/ 28	6.2E-02	1.2E+00	3.1E-01	D	0	Yes	Above background
Carbazole	6/ 28	1.1E-01	1.3E+01	8.2E-01	D	0	Yes	Above background
Chrysene	15/ 28	4.5E-02	2.8E+01	1.7E+00	X	0	Yes	Above background
Di-n-butyl phthalate	1/ 28	1.9E-01	1.9E-01	3.0E-01	D	0	No	<= 5% detects
Dibenz(*a,h*)anthracene	6/ 28	1.2E-01	4.1E+00	4.4E-01	D	0	Yes	Above background
Dibenzofuran	4/ 28	5.7E-02	8.8E+00	6.0E-01	D	0	Yes	Above background
Fluoranthene	16/ 28	5.7E-02	7.1E+01	3.7E+00	X	0	Yes	Above background
Fluorene	7/ 28	5.8E-02	1.3E+01	7.7E-01	D	0	Yes	Above background
Indeno(1,2,3-*cd*)pyrene	7/ 28	1.3E-01	1.2E+01	8.8E-01	D	0	Yes	Above background
Naphthalene	6/ 28	4.3E-02	4.7E+00	4.1E-01	D	0	Yes	Above background
Phenanthrene	12/ 28	6.3E-02	7.2E+01	3.4E+00	D	0	Yes	Above background
Pyrene	17/ 28	4.4E-02	5.8E+01	3.0E+00	X	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Organics-Volatile (concentration units = mg/kg)								
2-Butanone	1/ 27	1.3E-02	1.3E-02	9.9E-03	D	0	No	<= 5% detects
Acetone	2/ 26	3.4E-02	2.1E-01	1.9E-02	D	0	Yes	Above background
Chloromethane	1/ 27	5.1E-03	5.1E-03	2.9E-03	D	0	No	<= 5% detects
Toluene	12/ 27	6.6E-04	3.8E-02	4.6E-03	D	0	Yes	Above background
Packaging and Shipping Areas Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	7/ 7	4.5E+03	2.4E+04	1.0E+04	L	1.8E+04	Yes	Above background
Antimony	1/ 7	3.4E+01	3.4E+01	5.2E+00	D	9.6E-01	Yes	Above background
Arsenic	7/ 7	6.1E+00	1.7E+01	1.1E+01	N	1.5E+01	Yes	Above background
Barium	7/ 7	3.3E+01	8.2E+02	2.0E+02	L	8.8E+01	Yes	Above background
Beryllium	5/ 7	4.5E-01	3.4E+00	1.0E+00	L	8.8E-01	Yes	Above background
Cadmium	7/ 7	2.4E-01	3.7E+01	5.7E+00	X	0	Yes	Above background
Calcium	7/ 7	9.4E+02	1.3E+05	2.7E+04	L	1.6E+04	No	Essential element
Chromium	7/ 7	8.7E+00	1.4E+02	2.9E+01	X	1.7E+01	Yes	Above background
Cobalt	7/ 7	4.6E+00	7.6E+00	5.9E+00	L	1.0E+01	No	Below background
Copper	7/ 7	1.1E+01	1.2E+02	2.9E+01	X	1.8E+01	Yes	Above background
Iron	7/ 7	1.1E+04	1.9E+04	1.6E+04	N	2.3E+04	No	Essential element
Lead	7/ 7	1.5E+01	1.6E+03	2.5E+02	X	2.6E+01	Yes	Above background
Magnesium	7/ 7	1.0E+03	1.2E+04	3.8E+03	L	3.0E+03	No	Essential element
Manganese	7/ 7	2.5E+02	3.3E+03	1.0E+03	L	1.5E+03	Yes	Above background
Mercury	7/ 7	1.5E-02	5.9E-01	1.5E-01	L	3.6E-02	Yes	Above background
Nickel	7/ 7	1.1E+01	2.0E+01	1.4E+01	L	2.1E+01	No	Below background
Potassium	7/ 7	4.1E+02	9.4E+02	6.3E+02	L	9.3E+02	No	Essential element
Selenium	3/ 7	4.5E-01	7.7E-01	8.9E-01	D	1.4E+00	No	Below background
Silver	1/ 7	2.8E+01	2.8E+01	4.2E+00	D	0	Yes	Above background
Sodium	2/ 7	8.9E+01	3.6E+02	2.7E+02	D	1.2E+02	No	Essential element
Thallium	7/ 7	2.4E-01	3.0E-01	2.7E-01	N	0	Yes	Above background
Vanadium	7/ 7	4.8E+00	1.4E+01	9.9E+00	N	3.1E+01	No	Below background
Zinc	7/ 7	5.4E+01	1.5E+03	3.4E+02	L	6.2E+01	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
1,3,5-Trinitrobenzene	1/ 3	2.2E+00	2.2E+00	8.2E-01	D	0	Yes	Above background
2,4,6-Trinitrotoluene	2/ 3	6.8E-02	8.2E+02	2.7E+02	L	0	Yes	Above background
2,4-Dinitrotoluene	1/ 3	1.4E+00	1.4E+00	5.5E-01	D	0	Yes	Above background
Nitroguanidine	3/ 6	4.5E-02	1.4E-01	1.1E-01	N	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Organics-Pesticide/PCB (concentration units = mg/kg)								
PCB-1254	6/ 7	4.6E-02	9.1E+01	1.3E+01	L	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/kg)								
Benz(*a*)anthracene	1/ 1	1.7E-01	1.7E-01	1.7E-01	X	0	Yes	Above background
Benzo(*a*)pyrene	1/ 1	2.1E-01	2.1E-01	2.1E-01	X	0	Yes	Above background
Benzo(*b*)fluoranthene	1/ 1	3.2E-01	3.2E-01	3.2E-01	X	0	Yes	Above background
Benzo(*g,h,i*)perylene	1/ 1	9.9E-02	9.9E-02	9.9E-02	X	0	Yes	Above background
Benzo(*k*)fluoranthene	1/ 1	1.2E-01	1.2E-01	1.2E-01	X	0	Yes	Above background
Benzoic Acid	1/ 1	2.1E-01	2.1E-01	2.1E-01	X	0	Yes	Above background
Chrysene	1/ 1	2.0E-01	2.0E-01	2.0E-01	X	0	Yes	Above background
Fluoranthene	1/ 1	4.4E-01	4.4E-01	4.4E-01	X	0	Yes	Above background
Fluorene	1/ 1	7.4E-02	7.4E-02	7.4E-02	X	0	Yes	Above background
Indeno(1,2,3-*cd*)pyrene	1/ 1	1.0E-01	1.0E-01	1.0E-01	X	0	Yes	Above background
Phenanthrene	1/ 1	2.6E-01	2.6E-01	2.6E-01	X	0	Yes	Above background
Pyrene	1/ 1	4.9E-01	4.9E-01	4.9E-01	X	0	Yes	Above background
Perimeter Area Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	19/ 19	4.5E+03	1.7E+04	1.1E+04	N	1.8E+04	No	Below background
Antimony	2/ 16	1.3E+00	5.4E+00	9.3E-01	D	9.6E-01	Yes	Above background
Arsenic	19/ 19	6.3E+00	1.7E+01	1.1E+01	L	1.5E+01	Yes	Above background
Barium	19/ 19	4.6E+01	7.7E+02	1.1E+02	X	8.8E+01	Yes	Above background
Beryllium	15/ 16	4.3E-01	1.2E+00	6.0E-01	L	8.8E-01	Yes	Above background
Cadmium	12/ 19	7.0E-02	7.7E+01	4.6E+00	X	0	Yes	Above background
Calcium	16/ 16	1.8E+02	4.0E+04	5.5E+03	L	1.6E+04	No	Essential element
Chromium	19/ 19	6.0E+00	1.1E+02	2.2E+01	X	1.7E+01	Yes	Above background
Cobalt	16/ 16	3.6E+00	1.5E+01	7.8E+00	L	1.0E+01	Yes	Above background
Copper	16/ 16	6.1E+00	5.5E+01	1.6E+01	L	1.8E+01	Yes	Above background
Cyanide	1/ 2	2.4E+00	2.4E+00	1.3E+00	N	0	Yes	Above background
Iron	16/ 16	9.9E+03	3.3E+04	2.0E+04	N	2.3E+04	No	Essential element
Lead	19/ 19	1.4E+01	2.5E+03	1.7E+02	X	2.6E+01	Yes	Above background
Magnesium	16/ 16	9.4E+02	8.0E+03	2.4E+03	L	3.0E+03	No	Essential element
Manganese	19/ 19	1.3E+02	1.9E+03	7.1E+02	L	1.5E+03	Yes	Above background
Mercury	16/ 19	1.2E-02	1.0E-01	4.4E-02	N	3.6E-02	Yes	Above background
Nickel	16/ 16	6.8E+00	2.4E+01	1.4E+01	L	2.1E+01	Yes	Above background
Potassium	16/ 16	2.9E+02	1.1E+03	5.8E+02	L	9.3E+02	No	Essential element
Selenium	9/ 19	4.0E-01	1.9E+00	1.0E+00	D	1.4E+00	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Silver	1/ 19	4.0E-01	4.0E-01	2.6E-01	D	0	Yes	Above background
Sodium	2/ 16	1.1E+02	1.5E+02	2.7E+02	D	1.2E+02	No	Essential element
Thallium	11/ 16	2.2E-01	4.2E-01	2.7E-01	N	0	Yes	Above background
Vanadium	16/ 16	6.4E+00	2.9E+01	2.0E+01	X	3.1E+01	No	Below background
Zinc	19/ 19	3.6E+01	1.4E+03	1.3E+02	X	6.2E+01	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
1,3,5-Trinitrobenzene	1/ 3	1.0E-01	1.0E-01	1.2E-01	D	0	Yes	Above background
2,4,6-Trinitrotoluene	2/ 3	8.3E-01	2.4E+00	1.1E+00	L	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	2/ 3	2.6E-01	2.1E+00	8.3E-01	L	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	2/ 3	5.2E-01	3.4E+00	1.3E+00	L	0	Yes	Above background
HMX	1/ 3	3.3E+00	3.3E+00	1.3E+00	D	0	Yes	Above background
Nitrocellulose	1/ 1	6.1E+01	6.1E+01	6.1E+01	X	0	Yes	Above background
Nitroguanidine	1/ 1	5.1E+00	5.1E+00	5.1E+00	X	0	Yes	Above background
RDX	1/ 3	2.2E+01	2.2E+01	7.5E+00	D	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
4,4'-DDE	1/ 2	3.2E+00	3.2E+00	1.6E+00	N	0	Yes	Above background
Dieldrin	1/ 2	2.0E-02	2.0E-02	5.5E-02	N	0	Yes	Above background
Endrin Aldehyde	1/ 2	1.7E+00	1.7E+00	8.5E-01	N	0	Yes	Above background
Heptachlor	1/ 2	1.8E-01	1.8E-01	9.0E-02	N	0	Yes	Above background
Methoxychlor	1/ 2	4.3E-01	4.3E-01	2.2E-01	N	0	Yes	Above background
PCB-1254	3/ 8	1.5E+00	1.1E+02	1.6E+01	D	0	Yes	Above background
gamma-Chlordane	1/ 2	7.1E-01	7.1E-01	3.6E-01	N	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/kg)								
Anthracene	1/ 3	1.5E-01	1.5E-01	1.7E-01	D	0	Yes	Above background
Benz(*a*)anthracene	2/ 3	2.3E-01	6.9E-01	3.7E-01	L	0	Yes	Above background
Benzo(*a*)pyrene	2/ 3	2.7E-01	7.0E-01	3.9E-01	L	0	Yes	Above background
Benzo(*b*)fluoranthene	2/ 3	8.4E-01	9.8E-01	6.7E-01	N	0	Yes	Above background
Benzo(*g,h,i*)perylene	2/ 3	2.0E-01	3.6E-01	2.5E-01	L	0	Yes	Above background
Benzo(*k*)fluoranthene	2/ 3	2.1E-01	3.5E-01	2.5E-01	L	0	Yes	Above background
Bis(2-ethylhexyl)phthalate	1/ 3	1.1E-01	1.1E-01	1.6E-01	D	0	Yes	Above background
Chrysene	2/ 3	5.2E-01	7.6E-01	4.9E-01	N	0	Yes	Above background
Di-n-butyl phthalate	1/ 3	3.1E-01	3.1E-01	2.3E-01	D	0	Yes	Above background
Dibenz(a,h)anthracene	2/ 3	6.6E-02	9.7E-02	1.2E-01	L	0	Yes	Above background
Fluoranthene	2/ 3	4.1E-01	1.2E+00	6.0E-01	L	0	Yes	Above background
Indeno(1,2,3-*cd*)pyrene	2/ 3	1.9E-01	3.5E-01	2.4E-01	L	0	Yes	Above background
Phenanthrene	2/ 3	1.4E-01	5.0E-01	2.8E-01	L	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Pyrene	2/ 3	4.1E-01	1.2E+00	6.0E-01	L	0	Yes	Above background
Organics-Volatile (concentration units = mg/kg)								
Benzene	1/ 4	1.9E-03	1.9E-03	2.6E-03	D	0	Yes	Above background
Toluene	1/ 4	9.4E-03	9.4E-03	4.5E-03	D	0	Yes	Above background
Preparation and Receiving Areas Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	15/ 15	3.4E+03	1.7E+04	9.3E+03	N	1.8E+04	No	Below background
Antimony	7/ 15	1.0E+00	1.8E+01	2.9E+00	D	9.6E-01	Yes	Above background
Arsenic	15/ 15	5.2E+00	1.6E+01	1.1E+01	N	1.5E+01	Yes	Above background
Barium	15/ 15	2.5E+01	2.2E+02	1.0E+02	L	8.8E+01	Yes	Above background
Beryllium	13/ 15	3.1E-01	2.6E+00	7.9E-01	L	8.8E-01	Yes	Above background
Cadmium	15/ 15	7.2E-02	6.8E+00	1.7E+00	L	0	Yes	Above background
Calcium	15/ 15	6.1E+02	1.5E+05	3.3E+04	L	1.6E+04	No	Essential Element
Chromium	15/ 15	7.0E+00	5.1E+01	1.8E+01	L	1.7E+01	Yes	Above background
Cobalt	15/ 15	2.9E+00	1.3E+01	6.7E+00	N	1.0E+01	Yes	Above background
Copper	15/ 15	1.7E+01	3.3E+02	6.6E+01	X	1.8E+01	Yes	Above background
Cyanide	2/ 5	1.2E-01	6.8E-01	2.4E-01	D	0	Yes	Above background
Iron	15/ 15	9.0E+03	2.9E+04	1.9E+04	N	2.3E+04	No	Essential element
Lead	15/ 15	1.4E+01	6.3E+02	1.4E+02	L	2.6E+01	Yes	Above background
Magnesium	15/ 15	1.2E+03	1.4E+04	3.6E+03	L	3.0E+03	No	Essential element
Manganese	15/ 15	2.1E+02	1.6E+03	6.1E+02	L	1.5E+03	Yes	Above background
Mercury	11/ 15	1.1E-02	1.5E-01	4.8E-02	L	3.6E-02	Yes	Above background
Nickel	15/ 15	1.1E+01	2.7E+01	1.6E+01	L	2.1E+01	Yes	Above background
Potassium	15/ 15	3.9E+02	1.4E+03	7.6E+02	L	9.3E+02	No	Essential element
Selenium	5/ 15	4.3E-01	1.0E+00	9.5E-01	D	1.4E+00	No	Below background
Silver	1/ 15	2.9E-01	2.9E-01	2.5E-01	D	0	Yes	Above background
Sodium	9/ 15	5.7E+01	2.9E+02	2.1E+02	X	1.2E+02	No	Essential element
Thallium	14/ 15	1.1E-01	1.1E+00	4.2E-01	L	0	Yes	Above background
Vanadium	15/ 15	5.3E+00	2.2E+01	1.3E+01	N	3.1E+01	No	Below background
Zinc	15/ 15	5.3E+01	4.6E+02	1.5E+02	L	6.2E+01	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
2,4,6-Trinitrotoluene	4/ 10	1.4E-01	1.2E+00	2.5E-01	D	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	2/ 7	2.3E-01	2.8E-01	1.6E-01	D	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	2/ 7	2.7E-01	6.5E-01	2.2E-01	D	0	Yes	Above background
HMX	1/ 10	1.9E+00	1.9E+00	6.4E-01	D	0	Yes	Above background
Nitrocellulose	2/ 2	4.0E+00	2.8E+01	1.6E+01	N	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Nitroguanidine	1/ 2	8.4E-02	8.4E-02	1.0E-01	N	0	Yes	Above background
RDX	1/ 10	3.1E+01	3.1E+01	3.4E+00	D	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
4,4'-DDE	2/ 5	1.1E-02	1.2E-02	6.9E-03	D	0	Yes	Above background
4,4'-DDT	2/ 5	2.2E-02	7.7E-02	2.1E-02	D	0	Yes	Above background
Endrin Aldehyde	2/ 5	4.8E-03	1.0E-02	5.3E-03	D	0	Yes	Above background
Heptachlor	1/ 5	1.6E-03	1.6E-03	3.4E-03	D	0	Yes	Above background
PCB-1254	10/ 15	4.5E-02	1.4E+01	1.3E+00	L	0	Yes	Above background
PCB-1260	2/ 15	1.9E-01	2.3E-01	1.3E-01	D	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/kg)								
Anthracene	1/ 9	8.6E-02	8.6E-02	1.8E-01	D	0	Yes	Above background
Benz(*a*)anthracene	3/ 9	1.1E-01	5.4E-01	2.5E-01	D	0	Yes	Above background
Benzo(*a*)pyrene	3/ 9	1.2E-01	6.1E-01	2.7E-01	D	0	Yes	Above background
Benzo(*b*)fluoranthene	3/ 9	1.6E-01	9.6E-01	3.3E-01	D	0	Yes	Above background
Benzo(*g,h,i*)perylene	3/ 9	6.7E-02	3.2E-01	1.9E-01	D	0	Yes	Above background
Benzo(*k*)fluoranthene	4/ 9	6.2E-02	3.9E-01	1.9E-01	D	0	Yes	Above background
Bis(2-ethylhexyl)phthalate	1/ 9	2.4E-01	2.4E-01	1.9E-01	D	0	Yes	Above background
Butyl benzyl phthalate	1/ 9	8.8E-02	8.8E-02	1.8E-01	D	0	Yes	Above background
Chrysene	3/ 9	1.2E-01	5.1E-01	2.5E-01	D	0	Yes	Above background
Di-n-butyl phthalate	2/ 9	1.1E-01	2.7E-01	1.9E-01	D	0	Yes	Above background
Dibenz(*a,h*)anthracene	2/ 9	6.9E-02	8.3E-02	1.6E-01	D	0	Yes	Above background
Fluoranthene	4/ 9	5.1E-02	7.8E-01	3.1E-01	D	0	Yes	Above background
Fluorene	1/ 9	5.5E-02	5.5E-02	1.7E-01	D	0	Yes	Above background
Indeno(1,2,3-*cd*)pyrene	2/ 9	2.4E-01	3.2E-01	2.1E-01	D	0	Yes	Above background
Phenanthrene	3/ 9	1.3E-01	1.9E-01	1.8E-01	D	0	Yes	Above background
Pyrene	3/ 9	2.5E-01	8.9E-01	3.2E-01	D	0	Yes	Above background
Organics-Volatile (concentration units = mg/kg)								
2-Butanone	1/ 9	6.9E-03	6.9E-03	8.0E-03	D	0	Yes	Above background
Acetone	2/ 9	3.3E-03	6.6E-02	1.4E-02	D	0	Yes	Above background
Methylene Chloride	2/ 9	2.0E-03	4.0E-03	3.8E-03	D	0	Yes	Above background
Toluene	2/ 9	1.1E-03	1.4E-03	2.4E-03	D	0	Yes	Above background
West Ditches Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	16/ 16	5.4E+03	1.4E+04	9.5E+03	N	1.8E+04	No	Below background
Antimony	1/ 11	1.8E+02	1.8E+02	1.7E+01	D	9.6E-01	Yes	Above background
Arsenic	16/ 16	9.6E+00	2.2E+01	1.5E+01	L	1.5E+01	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Barium	16/ 16	5.6E+01	1.9E+02	8.6E+01	X	8.8E+01	Yes	Above background
Beryllium	11/ 11	5.0E-01	1.4E+00	8.5E-01	L	8.8E-01	Yes	Above background
Cadmium	15/ 16	1.1E-01	1.9E+00	7.1E-01	X	0	Yes	Above background
Calcium	11/ 11	8.3E+02	1.5E+04	5.6E+03	L	1.6E+04	No	Essential element
Chromium	16/ 16	7.4E+00	1.1E+02	2.0E+01	X	1.7E+01	Yes	Above background
Cobalt	11/ 11	6.6E+00	3.1E+01	1.2E+01	L	1.0E+01	Yes	Above background
Copper	11/ 11	9.9E+00	1.1E+03	1.1E+02	X	1.8E+01	Yes	Above background
Iron	11/ 11	1.7E+04	2.7E+04	2.3E+04	X	2.3E+04	No	Essential element
Lead	16/ 16	1.7E+01	8.7E+02	8.3E+01	X	2.6E+01	Yes	Above background
Magnesium	11/ 11	1.3E+03	4.1E+03	2.0E+03	X	3.0E+03	No	Essential element
Manganese	16/ 16	2.1E+02	4.6E+03	1.2E+03	L	1.5E+03	Yes	Above background
Mercury	11/ 16	2.2E-02	2.3E-01	6.0E-02	L	3.6E-02	Yes	Above background
Nickel	11/ 11	1.3E+01	3.1E+01	1.8E+01	L	2.1E+01	Yes	Above background
Potassium	11/ 11	3.6E+02	9.7E+02	6.7E+02	N	9.3E+02	No	Essential element
Selenium	10/ 16	4.4E-01	3.6E+00	1.5E+00	N	1.4E+00	Yes	Above background
Silver	4/ 16	2.3E-01	1.5E+00	3.6E-01	D	0	Yes	Above background
Thallium	6/ 11	2.6E-01	4.4E-01	2.7E-01	L	0	Yes	Above background
Vanadium	11/ 11	1.4E+01	2.8E+01	2.0E+01	L	3.1E+01	No	Below background
Zinc	16/ 16	5.2E+01	5.6E+02	2.0E+02	L	6.2E+01	Yes	Above background
Organics-Total Organic Carbon (concentration units = mg/kg)								
Total Organic Carbon	10/ 10	3.4E+03	4.6E+04	2.1E+04	N	2.4E+04	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
1,3,5-Trinitrobenzene	1/ 10	4.5E-01	4.5E-01	1.6E-01	D	0	Yes	Above background
2,4,6-Trinitrotoluene	7/ 10	3.2E-01	1.1E+02	1.2E+01	X	0	Yes	Above background
2,4-Dinitrotoluene	1/ 10	4.7E-02	4.7E-02	1.3E-01	D	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	4/ 5	1.2E-01	3.2E+00	8.2E-01	L	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	3/ 5	2.3E-01	8.2E-01	3.0E+00	L	0	Yes	Above background
Nitroguanidine	1/ 1	4.3E-02	4.3E-02	4.3E-02	X	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
4,4'-DDE	2/ 5	5.3E-02	1.3E-01	6.1E-02	D	0	Yes	Above background
Dieldrin	1/ 5	5.8E-02	5.8E-02	3.7E-02	D	0	Yes	Above background
Endrin Aldehyde	1/ 5	5.3E-02	5.3E-02	3.6E-02	D	0	Yes	Above background
Endrin Ketone	1/ 5	1.9E-02	1.9E-02	3.2E-02	D	0	Yes	Above background
PCB-1254	6/ 9	5.0E-02	3.6E+01	5.1E+00	X	0	Yes	Above background
PCB-1260	1/ 9	2.2E-01	2.2E-01	3.3E-01	D	0	Yes	Above background
beta-BHC	1/ 5	1.2E-01	1.2E-01	4.3E-02	D	0	Yes	Above background

Table 4-3. Summary Statistics and Determination of SRCs in Load Line 3 Surface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
gamma-Chlordane	1/ 5	5.9E-02	5.9E-02	3.7E-02	D	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/kg)								
Acenaphthene	3/ 5	8.8E-02	1.8E-01	1.6E-01	N	0	Yes	Above background
Acenaphthylene	1/ 5	2.1E-01	2.1E-01	2.5E-01	D	0	Yes	Above background
Anthracene	3/ 5	1.8E-01	8.6E-01	4.0E-01	L	0	Yes	Above background
Benz(*a*)anthracene	5/ 5	1.1E-01	5.3E+00	1.9E+00	L	0	Yes	Above background
Benzo(*a*)pyrene	5/ 5	9.9E-02	4.5E+00	1.7E+00	L	0	Yes	Above background
Benzo(*b*)fluoranthene	5/ 5	1.8E-01	6.5E+00	2.5E+00	L	0	Yes	Above background
Benzo(*g,h,i*)perylene	5/ 5	7.1E-02	1.6E+00	7.3E-01	L	0	Yes	Above background
Benzo(*k*)fluoranthene	4/ 5	1.2E-01	2.6E+00	1.0E+00	L	0	Yes	Above background
Benzoic Acid	1/ 5	3.0E-01	3.0E-01	1.1E+00	D	0	Yes	Above background
Carbazole	3/ 5	1.9E-01	2.9E-01	2.2E-01	X	0	Yes	Above background
Chrysene	5/ 5	1.5E-01	5.5E+00	2.0E+00	L	0	Yes	Above background
Dibenz(*a,h*)anthracene	3/ 5	1.4E-01	6.7E-01	3.3E-01	L	0	Yes	Above background
Dibenzofuran	1/ 5	1.1E-01	1.1E-01	2.3E-01	D	0	Yes	Above background
Fluoranthene	5/ 5	2.2E-01	1.0E+01	3.9E+00	L	0	Yes	Above background
Fluorene	3/ 5	7.3E-02	3.2E-01	2.2E-01	N	0	Yes	Above background
Indeno(1,2,3-*cd*)pyrene	4/ 5	1.5E-01	1.9E+00	8.1E-01	L	0	Yes	Above background
Phenanthrene	5/ 5	9.1E-02	3.3E+00	1.5E+00	L	0	Yes	Above background
Pyrene	5/ 5	2.1E-01	8.0E+00	3.2E+00	L	0	Yes	Above background

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
BHC = Benzene hexachloride.
DDE = Dichlorodiphenyldichloroethylene.
DDT = Dichlorodiphenyltrichloroethane.
DLA = Defense Logistics Agency.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
PCB = Polychlorinated biphenyl.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SRC = Site-related contaminant.

Table 4-4. Summary Statistics and Determination of SRCs in Load Line 3 Subsurface Soil

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Explosives Handling Areas Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	22/ 22	4.6E+03	1.9E+04	8.6E+03	L	2.0E+04	No	Below background
Antimony	1/ 22	4.2E+00	4.2E+00	7.2E-01	D	9.6E-01	No	<= 5% detects
Arsenic	22/ 22	6.0E+00	2.4E+01	1.3E+01	L	2.0E+01	Yes	Above background
Barium	22/ 22	3.0E+01	4.3E+02	7.8E+01	X	1.2E+02	Yes	Above background
Beryllium	20/ 22	3.0E-01	2.6E+00	7.2E-01	L	8.8E-01	Yes	Above background
Cadmium	20/ 22	5.4E-02	3.1E+00	6.4E-01	L	0	Yes	Above background
Calcium	22/ 22	7.7E+02	1.1E+05	1.0E+04	L	3.6E+04	No	Essential element
Chromium	22/ 22	8.4E+00	4.0E+01	1.8E+01	L	2.7E+01	Yes	Above background
Cobalt	22/ 22	4.0E+00	1.5E+01	8.8E+00	L	2.3E+01	No	Below background
Copper	22/ 22	1.4E+01	5.5E+01	2.1E+01	X	3.2E+01	Yes	Above background
Iron	22/ 22	1.4E+04	3.3E+04	2.1E+04	L	3.5E+04	No	Essential element
Lead	22/ 22	1.2E+01	2.8E+02	5.7E+01	X	1.9E+01	Yes	Above background
Magnesium	22/ 22	1.4E+03	1.2E+04	2.8E+03	X	8.8E+03	No	Essential element
Manganese	22/ 22	3.0E+02	2.2E+03	6.7E+02	L	3.0E+03	No	Below background
Mercury	16/ 22	9.7E-03	6.7E-01	5.4E-02	X	4.4E-02	Yes	Above background
Nickel	22/ 22	1.1E+01	4.8E+01	2.1E+01	L	6.1E+01	No	Below background
Potassium	22/ 22	4.6E+02	1.1E+03	7.6E+02	L	3.4E+03	No	Essential element
Selenium	8/ 22	4.3E-01	1.0E+00	9.6E-01	D	1.5E+00	No	Below background
Sodium	1/ 22	2.3E+02	2.3E+02	2.8E+02	D	1.5E+02	No	Essential element
Thallium	12/ 20	2.2E-01	6.7E-01	3.0E-01	L	9.1E-01	No	Below background
Vanadium	22/ 22	9.0E+00	2.2E+01	1.4E+01	L	3.8E+01	No	Below background
Zinc	22/ 22	5.0E+01	2.2E+02	8.5E+01	X	9.3E+01	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
1,3,5-Trinitrobenzene	9/ 13	9.1E-02	9.3E+00	1.6E+00	X	0	Yes	Above background
1,3-Dinitrobenzene	1/ 13	1.4E+00	1.4E+00	2.7E-01	D	0	Yes	Above background
2,4,6-Trinitrotoluene	12/ 13	2.8E-01	2.7E+02	7.1E+01	X	0	Yes	Above background
2,4-Dinitrotoluene	5/ 13	2.8E-01	1.5E+00	3.6E-01	D	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	12/ 13	1.4E-01	5.8E+00	1.8E+00	L	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	6/ 13	2.1E-01	1.4E+00	6.8E+00	D	0	Yes	Above background
HMX	1/ 13	3.9E+00	3.9E+00	6.3E-01	D	0	Yes	Above background
Nitrobenzene	2/ 13	1.5E-01	6.5E-01	2.2E-01	D	0	Yes	Above background

Table 4-4. Summary Statistics and Determination of SRCs in Load Line 3 Subsurface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
RDX	3/ 13	1.7E-01	3.3E+00	6.0E-01	D	0	Yes	Above background
Tetryl	1/ 13	3.0E+00	3.0E+00	6.6E-01	D	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
PCB-1254	2/ 3	4.9E+00	3.5E+01	1.3E+01	L	0	Yes	Above background
Perimeter Area Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	2/ 2	1.0E+04	1.3E+04	1.2E+04	N	2.0E+04	No	Below background
Arsenic	2/ 2	9.3E+00	2.4E+01	1.7E+01	N	2.0E+01	Yes	Above background
Barium	2/ 2	9.6E+01	2.8E+02	1.9E+02	N	1.2E+02	Yes	Above background
Beryllium	2/ 2	6.9E-01	1.5E+00	1.1E+00	N	8.8E-01	Yes	Above background
Cadmium	1/ 2	2.1E+01	2.1E+01	1.0E+01	N	0	Yes	Above background
Calcium	2/ 2	1.1E+04	3.3E+04	2.2E+04	N	3.6E+04	No	Essential element
Chromium	2/ 2	2.1E+01	4.8E+01	3.5E+01	N	2.7E+01	Yes	Above background
Cobalt	2/ 2	5.4E+00	1.1E+01	8.2E+00	N	2.3E+01	No	Below background
Copper	2/ 2	1.3E+01	3.2E+01	2.3E+01	N	3.2E+01	Yes	Above background
Iron	2/ 2	1.9E+04	2.2E+04	2.1E+04	N	3.5E+04	No	Essential element
Lead	2/ 2	1.8E+01	5.3E+02	2.7E+02	N	1.9E+01	Yes	Above background
Magnesium	2/ 2	3.2E+03	4.8E+03	4.0E+03	N	8.8E+03	No	Essential element
Manganese	2/ 2	9.1E+02	1.6E+03	1.3E+03	N	3.0E+03	No	Below background
Mercury	2/ 2	3.2E-02	4.3E-02	3.8E-02	N	4.4E-02	No	Below background
Nickel	2/ 2	1.3E+01	3.6E+01	2.5E+01	N	6.1E+01	No	Below background
Potassium	2/ 2	7.7E+02	1.0E+03	8.9E+02	N	3.4E+03	No	Essential element
Sodium	1/ 2	1.6E+02	1.6E+02	2.2E+02	N	1.5E+02	No	Essential element
Thallium	1/ 2	3.4E-01	3.4E-01	2.6E-01	N	9.1E-01	No	Below background
Vanadium	2/ 2	9.7E+00	2.2E+01	1.6E+01	N	3.8E+01	No	Below background
Zinc	2/ 2	4.7E+01	3.8E+02	2.1E+02	N	9.3E+01	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
1,3,5-Trinitrobenzene	2/ 2	6.1E-01	9.1E-01	7.6E-01	N	0	Yes	Above background
1,3-Dinitrobenzene	1/ 2	8.2E-02	8.2E-02	6.7E-01	N	0	Yes	Above background
2,4,6-Trinitrotoluene	2/ 2	6.2E+00	5.0E+02	2.5E+02	N	0	Yes	Above background
2,4-Dinitrotoluene	1/ 2	7.1E-01	7.1E-01	9.8E-01	N	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	1/ 2	7.9E+00	7.9E+00	5.2E+00	N	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	1/ 2	6.9E+00	6.9E+00	2.8E+01	N	0	Yes	Above background

Table 4-4. Summary Statistics and Determination of SRCs in Load Line 3 Subsurface Soil (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
HMX	1/ 2	4.6E+00	4.6E+00	3.6E+00	N	0	Yes	Above background
RDX	1/ 2	3.8E+01	3.8E+01	2.0E+01	N	0	Yes	Above background
Preparation and Receiving Areas Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	3/ 3	5.5E+03	7.6E+03	6.9E+03	X	2.0E+04	No	Below background
Arsenic	3/ 3	1.3E+01	2.4E+01	1.8E+01	L	2.0E+01	Yes	Above background
Barium	3/ 3	2.1E+01	5.5E+01	4.0E+01	N	1.2E+02	No	Below background
Beryllium	3/ 3	3.4E-01	5.8E-01	4.5E-01	L	8.8E-01	No	Below background
Cadmium	2/ 3	1.3E-01	3.2E-01	2.5E-01	N	0	Yes	Above background
Calcium	3/ 3	6.1E+02	1.6E+04	6.1E+03	L	3.6E+04	No	Essential element
Chromium	3/ 3	6.9E+00	1.2E+01	9.8E+00	N	2.7E+01	No	Below background
Cobalt	3/ 3	5.5E+00	7.8E+00	6.7E+00	N	2.3E+01	No	Below background
Copper	3/ 3	1.6E+01	2.5E+01	2.2E+01	N	3.2E+01	No	Below background
Iron	3/ 3	1.7E+04	2.2E+04	2.0E+04	L	3.5E+04	No	Essential element
Lead	3/ 3	1.1E+01	4.1E+01	2.5E+01	N	1.9E+01	Yes	Above background
Magnesium	3/ 3	1.3E+03	2.8E+03	2.0E+03	L	8.8E+03	No	Essential element
Manganese	3/ 3	2.5E+02	4.8E+02	3.4E+02	L	3.0E+03	No	Below background
Mercury	1/ 3	1.3E-02	1.3E-02	4.4E-02	D	4.4E-02	No	Below background
Nickel	3/ 3	1.2E+01	2.0E+01	1.7E+01	N	6.1E+01	No	Below background
Potassium	3/ 3	3.7E+02	7.4E+02	6.1E+02	N	3.4E+03	No	Essential element
Vanadium	3/ 3	9.4E+00	1.3E+01	1.1E+01	N	3.8E+01	No	Below background
Zinc	3/ 3	5.8E+01	1.0E+02	7.3E+01	L	9.3E+01	Yes	Above background

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
PCB = Polychlorinated biphenyl.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SRC = Site-related contaminant.

Table 4-5. Summary Statistics and Determination of SRCs in Stream and Pond Load Line 3 Sediment

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Cobb's Pond Tributary								
Metals (concentration units = mg/kg)								
Aluminum	6/ 6	6.6E+03	1.2E+04	9.0E+03	L	1.4E+04	No	Below background
Antimony	2/ 5	9.7E-01	1.8E+01	4.3E+00	D	0	Yes	Above background
Arsenic	6/ 6	4.5E+00	1.9E+01	9.2E+00	L	2.0E+01	No	Below background
Barium	6/ 6	4.0E+01	8.7E+01	6.1E+01	L	1.2E+02	No	Below background
Beryllium	4/ 5	5.3E-01	6.8E-01	5.4E-01	N	3.8E-01	Yes	Above background
Cadmium	5/ 6	6.0E-02	3.5E+00	8.3E-01	L	0	Yes	Above background
Calcium	5/ 5	1.3E+03	2.3E+03	1.6E+03	X	5.5E+03	No	Essential element
Chromium	6/ 6	9.3E+00	2.0E+01	1.4E+01	L	1.8E+01	Yes	Above background
Cobalt	5/ 5	6.5E+00	1.5E+01	1.0E+01	L	9.1E+00	Yes	Above background
Copper	5/ 5	1.2E+01	2.2E+02	5.6E+01	X	2.8E+01	Yes	Above background
Iron	5/ 5	1.6E+04	1.2E+05	4.0E+04	X	2.8E+04	No	Essential element
Lead	6/ 6	8.8E+00	9.2E+01	3.0E+01	L	2.7E+01	Yes	Above background
Magnesium	5/ 5	1.1E+03	1.8E+03	1.5E+03	N	2.8E+03	No	Essential element
Manganese	6/ 6	1.3E+02	6.9E+02	3.5E+02	L	2.0E+03	No	Below background
Mercury	5/ 6	3.4E-02	6.0E-02	5.2E-02	N	5.9E-02	Yes	Above background
Nickel	5/ 5	1.3E+01	4.2E+01	2.0E+01	X	1.8E+01	Yes	Above background
Potassium	5/ 5	4.4E+02	6.3E+02	5.3E+02	N	2.0E+03	No	Essential element
Selenium	4/ 6	5.8E-01	9.9E-01	1.2E+00	L	1.7E+00	No	Below background
Silver	1/ 6	1.1E+01	1.1E+01	2.0E+00	D	0	Yes	Above background
Sodium	2/ 5	1.4E+02	1.8E+02	2.9E+02	D	1.1E+02	No	Essential element
Thallium	5/ 5	2.5E-01	8.9E-01	4.1E-01	X	8.9E-01	No	Below background
Vanadium	5/ 5	1.4E+01	2.4E+01	1.8E+01	L	2.6E+01	No	Below background
Zinc	6/ 6	4.5E+01	2.2E+03	4.2E+02	X	5.3E+02	Yes	Above background
Organics-Total Organic Carbon (concentration units = mg/kg)								
Total Organic Carbon	5/ 5	2.6E+03	3.5E+04	1.4E+04	L	0	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
2,4,6-Trinitrotoluene	2/ 3	6.5E-01	1.4E+00	7.3E-01	N	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	1/ 1	3.7E-01	3.7E-01	3.7E-01	X	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
4,4'-DDE	1/ 1	3.2E-03	3.2E-03	3.2E-03	X	0	Yes	Above background
4,4'-DDT	1/ 1	8.1E-03	8.1E-03	8.1E-03	X	0	Yes	Above background
Endrin	1/ 1	1.0E-02	1.0E-02	1.0E-02	X	0	Yes	Above background

Table 4-5. Summary Statistics and Determination of SRCs in Stream and Pond Load Line 3 Sediment (continued)

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
PCB-1254	1/ 5	1.8E-01	1.8E-01	5.9E-02	D	0	Yes	Above background
gamma-Chlordane	1/ 1	2.9E-03	2.9E-03	2.9E-03	X	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/kg)								
Benz(*a*)anthracene	1/ 1	1.0E-01	1.0E-01	1.0E-01	X	0	Yes	Above background
Benzo(*a*)pyrene	1/ 1	1.4E-01	1.4E-01	1.4E-01	X	0	Yes	Above background
Benzo(*b*)fluoranthene	1/ 1	1.3E-01	1.3E-01	1.3E-01	X	0	Yes	Above background
Benzo(*g,h,i*)perylene	1/ 1	8.8E-02	8.8E-02	8.8E-02	X	0	Yes	Above background
Benzo(*k*)fluoranthene	1/ 1	1.4E-01	1.4E-01	1.4E-01	X	0	Yes	Above background
Bis(2-ethylhexyl)phthalate	1/ 1	5.4E-02	5.4E-02	5.4E-02	X	0	Yes	Above background
Chrysene	1/ 1	1.3E-01	1.3E-01	1.3E-01	X	0	Yes	Above background
Dibenz(*a,h*)anthracene	1/ 1	5.5E-02	5.5E-02	5.5E-02	X	0	Yes	Above background
Fluoranthene	1/ 1	2.4E-01	2.4E-01	2.4E-01	X	0	Yes	Above background
Indeno(1,2,3-*cd*)pyrene	1/ 1	1.1E-01	1.1E-01	1.1E-01	X	0	Yes	Above background
Phenanthrene	1/ 1	9.1E-02	9.1E-02	9.1E-02	X	0	Yes	Above background
Pyrene	1/ 1	1.8E-01	1.8E-01	1.8E-01	X	0	Yes	Above background
Organics-Volatile (concentration units = mg/kg)								
Toluene	1/ 1	4.0E-03	4.0E-03	4.0E-03	X	0	Yes	Above background

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
DDE = Dichlorodiphenyldichloroethylene.
DDT = Dichlorodiphenyltrichloroethane.
PCB = Polychlorinated biphenyl.
SRC = Site-related contaminant.

Table 4-6. Summary Statistics and Determination of SRCs in Stream and Pond Load Line 3 Surface Water

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Cobb's Pond Tributary								
Metals (concentration units =mg/L)								
Aluminum	2/ 2	2.3E-01	6.8E-01	4.6E-01	N	3.4E+00	No	Below background
Antimony	1/ 2	2.5E-03	2.5E-03	3.8E-03	N	0	Yes	Above background
Arsenic	2/ 2	4.3E-03	4.7E-03	4.5E-03	N	3.2E-03	Yes	Above background
Barium	2/ 2	5.4E-02	8.0E-02	6.7E-02	N	4.8E-02	Yes	Above background
Calcium	2/ 2	2.2E+01	3.9E+01	3.1E+01	N	4.1E+01	No	Essential element
Cobalt	1/ 2	6.5E-03	6.5E-03	3.9E-03	N	0	Yes	Above background
Iron	2/ 2	2.7E+00	3.8E+00	3.3E+00	N	2.6E+00	No	Essential element
Magnesium	2/ 2	5.5E+00	5.6E+00	5.6E+00	N	1.1E+01	No	Essential element
Manganese	2/ 2	3.5E+00	7.8E+00	5.7E+00	N	3.9E-01	Yes	Above background
Nickel	1/ 2	8.7E-03	8.7E-03	5.1E-03	N	0	Yes	Above background
Potassium	2/ 2	4.3E+00	7.4E+00	5.9E+00	N	3.2E+00	No	Essential element
Sodium	2/ 2	1.1E+00	6.4E+00	3.8E+00	N	2.1E+01	No	Essential element
Vanadium	1/ 2	1.5E-03	1.5E-03	2.5E-03	N	0	Yes	Above background
Zinc	2/ 2	1.6E-02	2.6E-02	2.1E-02	N	4.2E-02	No	Below background
Organics-Volatile (concentration units =mg/L)								
2-Butanone	1/ 1	7.0E-04	7.0E-04	7.0E-04	X	0	Yes	Above background

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
SRC = Site-related contaminant.

Table 4-7. Summary Statistics and Determination of SRCs in Load Line 3 Miscellaneous Water

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Miscellaneous Water Samples Aggregate								
Metals (concentration units = mg/L)								
Aluminum	1/ 1	3.1E-01	3.1E-01	3.1E-01	X	3.4E+00	No	Below background
Antimony	1/ 1	1.3E-02	1.3E-02	1.3E-02	X	0	Yes	Above background
Barium	1/ 1	5.4E-02	5.4E-02	5.4E-02	X	4.8E-02	Yes	Above background
Calcium	1/ 1	7.4E+01	7.4E+01	7.4E+01	X	4.1E+01	No	Essential element
Iron	1/ 1	3.8E-01	3.8E-01	3.8E-01	X	2.6E+00	No	Essential element
Magnesium	1/ 1	4.8E+00	4.8E+00	4.8E+00	X	1.1E+01	No	Essential element
Manganese	1/ 1	3.9E-01	3.9E-01	3.9E-01	X	3.9E-01	No	Below background
Potassium	1/ 1	2.9E+00	2.9E+00	2.9E+00	X	3.2E+00	No	Essential element
Sodium	1/ 1	1.1E+00	1.1E+00	1.1E+00	X	2.1E+01	No	Essential element
Organics-Explosives (concentration units = mg/L)								
1,3,5-Trinitrobenzene	1/ 1	3.1E-04	3.1E-04	3.1E-04	X	0	Yes	Above background
2,4,6-Trinitrotoluene	1/ 1	2.6E-02	2.6E-02	2.6E-02	X	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	1/ 1	9.8E-03	9.8E-03	9.8E-03	X	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	1/ 1	2.5E-02	2.5E-02	2.5E-02	X	0	Yes	Above background

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
SRC = Site-related contaminant.

Table 4-8. Summary Statistics and Determination of SRCs in Load Line 3 Groundwater

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Metals (concentration units = mg/L)								
Barium	12/ 12	8.8E-03	3.3E-02	1.7E-02	L	2.6E-01	No	Below background
Calcium	12/ 12	7.4E+00	6.2E+01	3.0E+01	N	5.3E+01	No	Essential element
Cobalt	7/ 12	1.3E-03	1.3E-02	5.1E-03	L	0	Yes	Above background
Iron	4/ 12	1.1E-01	4.8E-01	1.8E-01	D	1.4E+00	No	Essential element
Magnesium	12/ 12	4.2E+00	3.8E+01	1.4E+01	L	1.5E+01	No	Essential element
Manganese	12/ 12	1.7E-02	2.2E+00	9.2E-01	N	1.3E+00	Yes	Above background
Nickel	9/ 12	4.2E-03	5.1E-02	1.7E-02	N	8.3E-02	No	Below background
Potassium	12/ 12	9.0E-01	6.9E+00	2.1E+00	X	5.8E+00	No	Essential element
Sodium	12/ 12	9.9E-01	2.9E+01	1.0E+01	L	5.1E+01	No	Essential element
Zinc	4/ 12	1.3E-02	2.2E-02	1.8E-02	D	5.2E-02	No	Below background
Organics-Explosives (concentration units = mg/L)								
1,3,5-Trinitrobenzene	2/ 12	1.9E-03	5.0E-02	4.4E-03	D	0	Yes	Above background
1,3-Dinitrobenzene	1/ 12	1.2E-04	1.2E-04	1.0E-04	D	0	Yes	Above background
2,4,6-Trinitrotoluene	2/ 12	9.2E-04	8.2E-02	7.0E-03	D	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	3/ 12	1.2E-04	3.2E-02	2.9E-03	D	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	3/ 12	2.3E-04	5.4E-02	4.7E-03	D	0	Yes	Above background
HMX	1/ 12	2.0E-03	2.0E-03	4.0E-04	D	0	Yes	Above background
RDX	3/ 12	4.7E-04	7.7E-03	9.8E-04	D	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/L)								
Heptachlor Epoxide	1/ 12	7.5E-05	7.5E-05	2.9E-05	D	0	Yes	Above background
beta-BHC	1/ 12	1.5E-04	1.5E-04	3.5E-05	D	0	Yes	Above background
Organics-Semivolatile (concentration units = mg/L)								
Bis(2-ethylhexyl)phthalate	1/ 12	4.7E-03	4.7E-03	5.0E-03	D	0	Yes	Above background
Organics-Volatile (concentration units = mg/L)								
Acetone	6/ 12	2.1E-03	6.7E-03	4.2E-03	N	0	Yes	Above background
Carbon Disulfide	1/ 12	1.4E-03	1.4E-03	5.8E-04	D	0	Yes	Above background
Carbon Tetrachloride	2/ 12	1.5E-04	2.5E-04	4.5E-04	D	0	Yes	Above background
Chloroform	2/ 12	2.0E-04	1.2E-03	5.3E-04	D	0	Yes	Above background
Chloromethane	3/ 12	1.5E-04	2.3E-04	4.2E-04	D	0	Yes	Above background
Tetrachloroethene	1/ 12	4.9E-04	4.9E-04	5.0E-04	D	0	Yes	Above background
Toluene	1/ 12	2.0E-04	2.0E-04	4.8E-04	D	0	Yes	Above background

Table 4-8. Summary Statistics and Determination of SRCs in Load Line 3 Groundwater (continued)

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
BHC = Benzene hexachloride.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
PCB = Polychlorinated biphenyl.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SRC = Site-related contaminant.

Table 4-9. Summary Statistics and Determination of SRCs in Load Line 3 Storm and Sanitary Sewer Water

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Storm/Sanitary Sewers Water Samples Aggregate								
Metals (concentration units = mg/L)								
Aluminum	2/ 2	1.2E-01	2.3E-01	1.8E-01	N	3.4E+00	No	Below background
Barium	2/ 2	1.4E-02	2.5E-02	2.0E-02	N	4.8E-02	No	Below background
Calcium	2/ 2	2.0E+01	2.9E+01	2.5E+01	N	4.1E+01	No	Essential element
Iron	2/ 2	2.1E-01	5.5E-01	3.8E-01	N	2.6E+00	No	Essential element
Lead	1/ 2	3.2E-03	3.2E-03	4.1E-03	N	0	Yes	Above background
Magnesium	2/ 2	6.4E-01	4.7E+00	2.7E+00	N	1.1E+01	No	Essential element
Manganese	2/ 2	1.6E-02	4.3E-02	3.0E-02	N	3.9E-01	No	Below background
Nickel	1/ 2	5.8E-03	5.8E-03	9.2E-03	N	0	Yes	Above background
Potassium	2/ 2	1.2E+00	6.3E+00	3.8E+00	N	3.2E+00	No	Essential element
Silver	1/ 2	6.7E-03	6.7E-03	4.6E-03	N	0	Yes	Above background
Sodium	2/ 2	2.5E+00	5.2E+00	3.9E+00	N	2.1E+01	No	Essential element
Zinc	1/ 2	2.7E-02	2.7E-02	2.1E-02	N	4.2E-02	No	Below background
Organics-Explosives (concentration units = mg/L)								
2,4,6-Trinitrotoluene	1/ 2	1.8E-03	1.8E-03	9.5E-04	N	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	2/ 2	7.5E-04	2.3E-03	1.5E-03	N	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	2/ 2	1.7E-03	3.4E-03	2.6E-03	N	0	Yes	Above background
HMX	1/ 2	2.7E-04	2.7E-04	2.6E-04	N	0	Yes	Above background
RDX	2/ 2	3.4E-04	5.0E-04	4.2E-04	N	0	Yes	Above background

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SRC = Site-related contaminant.

Table 4-10. Summary Statistics and Determination of SRCs in Storm and Sanitary Sewer Load Line 3 Sediment

Contaminant	Freq. of Det.	Min. Det.	Max. Det.	Mean Conc.[a]	Dist.[b]	Background Conc.[c]	SRC?	Justification[d]
Storm/Sanitary Sewers Sediment Samples Aggregate								
Metals (concentration units = mg/kg)								
Aluminum	6/ 6	4.9E+03	1.1E+04	7.4E+03	L	1.4E+04	No	Below background
Antimony	3/ 6	1.9E+00	7.6E+02	1.6E+02	X	0	Yes	Above background
Arsenic	6/ 6	8.7E+00	2.4E+01	1.4E+01	L	2.0E+01	Yes	Above background
Barium	6/ 6	3.7E+01	2.0E+03	4.1E+02	L	1.2E+02	Yes	Above background
Beryllium	5/ 6	4.9E-01	1.1E+00	6.1E-01	N	3.8E-01	Yes	Above background
Cadmium	6/ 6	3.5E-01	9.3E+00	3.8E+00	L	0	Yes	Above background
Calcium	6/ 6	1.3E+03	4.0E+04	1.6E+04	L	5.5E+03	No	Essential element
Chromium	6/ 6	1.1E+01	4.6E+02	1.2E+02	L	1.8E+01	Yes	Above background
Cobalt	6/ 6	5.5E+00	2.1E+01	1.0E+01	L	9.1E+00	Yes	Above background
Copper	6/ 6	2.4E+01	1.3E+03	3.0E+02	L	2.8E+01	Yes	Above background
Iron	6/ 6	1.8E+04	9.2E+04	3.9E+04	L	2.8E+04	No	Essential element
Lead	6/ 6	5.5E+01	3.9E+03	8.7E+02	L	2.7E+01	Yes	Above background
Magnesium	6/ 6	1.5E+03	5.1E+03	2.8E+03	L	2.8E+03	No	Essential element
Manganese	6/ 6	2.4E+02	1.8E+03	8.8E+02	L	2.0E+03	No	Below background
Mercury	6/ 6	1.6E-02	2.3E-01	9.9E-02	L	5.9E-02	Yes	Above background
Nickel	6/ 6	1.3E+01	4.6E+01	2.3E+01	L	1.8E+01	Yes	Above background
Potassium	6/ 6	3.0E+02	8.6E+02	5.4E+02	L	2.0E+03	No	Essential element
Selenium	4/ 6	6.2E-01	4.5E+00	2.3E+00	L	1.7E+00	Yes	Above background
Silver	3/ 6	2.2E-01	2.2E+00	6.6E-01	X	0	Yes	Above background
Sodium	3/ 6	6.6E+01	1.8E+02	2.4E+02	L	1.1E+02	No	Essential element
Thallium	6/ 6	3.1E-01	5.5E-01	4.1E-01	L	8.9E-01	No	Below background
Vanadium	6/ 6	1.2E+01	1.8E+01	1.4E+01	L	2.6E+01	No	Below background
Zinc	6/ 6	1.2E+02	1.2E+03	6.3E+02	N	5.3E+02	Yes	Above background
Organics-Explosives (concentration units = mg/kg)								
1,3,5-Trinitrobenzene	1/ 5	7.7E-01	7.7E-01	2.6E-01	D	0	Yes	Above background
2,4,6-Trinitrotoluene	3/ 5	1.6E-01	6.8E+01	1.4E+01	X	0	Yes	Above background
2-Amino-4,6-Dinitrotoluene	2/ 5	6.9E-01	2.2E+00	6.5E-01	D	0	Yes	Above background
4-Amino-2,6-Dinitrotoluene	1/ 5	8.8E-01	8.8E-01	2.4E+00	D	0	Yes	Above background
Organics-Pesticide/PCB (concentration units = mg/kg)								
PCB-1254	6/ 6	5.6E-02	1.5E+01	4.2E+00	L	0	Yes	Above background

[a] One-half of the detection limit was used as a surrogate value for non-detects in the calculation of summary statistics.
[b] Distribution: D = Fewer than 50% detected - distribution not determined; L = Lognormal distribution; N = Normal distribution; X = Neither normal nor lognormal.
[c] Background criteria were set to zero for all organics and inorganics that were not detected in the background dataset.
[d] The essential nutrient screen was not applied for the ecological risk assessment.
PCB = Polychlorinated biphenyl.
SRC = Site-related contaminant.

4.1.3.3 Facility-wide background screen

For each inorganic constituent passing the frequency of detection screen, concentrations were compared against facility-wide background values developed as part of the Phase II RI for WBG (USACE 2001c). For inorganic constituents, if the maximum detected concentration (MDC) of an analyte exceeded its respective background criterion, it was considered to be an SRC. In the event a constituent was not detected in the background dataset, the background value was set to zero, and any detected result for that constituent was considered above background. This conservative process ensured that detected constituents were not eliminated as SRCs simply because they were not detected in the background set. All detected organic compounds were considered to be above background because these classes of compounds do not occur naturally.

4.1.3.4 Essential nutrients screen

Chemicals that are considered to be essential nutrients (calcium, chloride, iodine, iron, magnesium, potassium, phosphorus, and sodium) are an integral part of the food supply and are often added to foods as supplements. Thus, these constituents are not generally addressed as SRCs in the contaminant nature and extent evaluation and BHHRA (EPA 1989a and 1996b) unless they are grossly elevated relative to background values. The essential nutrient screen is not applied for the SERA. For the Load Line 3 Phase II RI, analyses were conducted for calcium, iron, magnesium, potassium, and sodium. These five constituents were eliminated as SRCs in all environmental media for the nature and extent evaluation and SHHRA.

4.1.4 Data Presentation

Data summary statistics and screening results for SRCs in each data aggregate are presented in Tables 4-3 through 4-10. In the sections addressing the nature and extent of contamination for each medium, analytical results for selected SRCs are presented on maps to depict spatial distribution. Inorganic chemicals depicted on figures were selected based on highest frequency of detection and/or magnitude of concentration above background and process knowledge. The relative concentrations above background were bracketed by non-detects and the MDC, and were arbitrarily subdivided between the highs and lows. Analytical results for classes of SRCs (e.g., explosive compounds, inorganics, or VOCs) are presented in data summary tables for each medium and spatial aggregate whenever a sufficient number of detected values occurred to merit such tables. Where few detected values for a class of SRCs occurred, the values are addressed in the text of the chapter. Complete analytical results, including all nondetected results, are contained in Appendix I. Each table in Appendix I presents the results for each sampling station for a specific medium aggregate (e.g., surface soil, subsurface soil, sediment) and class of analytes. Complete results for the samples taken during the Phase I RI are listed in the report addressing that investigation (USACE 1998). Results for field laboratory analysis of TNT and RDX are contained in Appendix J.

4.1.5 Use of Phase I Remedial Investigation Data

Phase I RI surface soil data were used quantitatively in the determination of SRCs and risk screening assessment. Minimal demolition activity was performed between the Phase I and II RIs. Phase I RI subaqueous sediment data were used only where a station was not re-sampled during the Phase II RI. Phase I RI dry sediments (i.e., storm water ditches, etc.) were addressed as soil. No Phase I RI data for groundwater, surface water, or subsurface soil exist to evaluate nature and extent of contamination in these media. Phase I samples are denoted on all Chapter 4.0 figures by the inclusion of a media description (e.g., ss for surface soil, sd for sediment, etc.) in the station ID. Phase II station IDs do not include the media description.

4.2 SURFACE SOILS

4.2.1 Summary of Phase I Remedial Investigation Data

One hundred thirty-five soil samples from 0 to 0.3 m (0 to 1 ft) bgs were collected during the Phase I RI at Load Line 3. Phase I RI sample results are summarized below.

- TNB, TNT, HMX, and RDX were detected in soil, with TNT being the most pervasive explosive compound. The maximum TNT concentration in soil was 390,000 mg/kg, detected in a sample collected from a vacuum pump housing east of Building EB-10. Other explosives were detected in that sample as well as soil samples collected outside the melt-pour building. Isolated detectable concentrations of HMX and RDX were noted at one surface sample location each. The occurrence of RDX was associated with the melt-pour Building EB-4A; HMX was associated with the settling basin between Buildings EB-4 and EB-10.

- The highest concentrations of several metals are associated with the melt-pour buildings and Building EB-803. A large number of metals are present in surface soils at concentrations above the established background values. Chromium, copper, lead, and manganese were detected at concentrations exceeding the range of USGS reference values.

- PCBs and/or pesticides were present in four samples. The highest levels of PCBs were associated with the south side of the melt-pour Building EB-4, where PCB-1254 was found at 21 mg/kg. PCBs were also found at Building EB-803 and along the connecting gallery between Buildings EB-4A and EB-3.

- PAHs were detected in and appear to be most abundant in two samples collected south of the melt-pour Building EB-4A.

4.2.2 Geotechnical Results

Nineteen disturbed or grab samples were collected from selected surface soil locations during the Phase II RI and submitted for moisture content and pH. Four of the 19 samples were additionally analyzed for Atterberg limits, grain size distribution, specific gravity, and USCS classification. The data are summarized in Table 4-11.

Sieve analyses and USCS classification identified the samples as Clayey sand with gravel (SC) and Sandy lean clay (CL). Moisture content of the samples ranged from 8.3 (LL3-086) to 25.7% (LL3-129). All samples selected for Atterberg limits analyses were identified as having some degree of plasticity. Specific gravity values ranged from 2.682 to 2.703, values typical of clayey materials. The complete analytical laboratory report for the geotechnical analysis is provided in Appendix K.

Surface soil samples collected during the Phase I RI were collected form the 0 to 0.6-m (0- to 2-ft) bgs interval; these were assigned as surface soil aggregate samples in the evaluation of contaminant nature and extent and risk evaluations. Phase I RI data are appropriately qualified in the nature and extent evaluations with respect to uncertainties resulting from their age, changes in analytical methods and detection limits, and limited TAL metals for many samples. However, for soil and sediment, the Phase I RI data provide valuable information regarding extent of contamination within source areas and exit conveyances from the source areas.

Table 4-11. Phase II RI Geotechnical Data for Load Line 3 Surface Soil Samples

Station ID	Depth (ft)	Moisture Content	Atterberg Limits		Grain Size				pH	Specific Gravity	USCS
			LL	PI	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
LL3-057	0 to 1	16.7	--	--	--	--	--	--	6.63	--	--
LL3-060	0 to 1	11.4	--	--	--	--	--	--	5.99	--	--
LL3-064	0 to 1	20.1	--	--	--	--	--	--	5.14	--	--
LL3-065	0 to 1	17.0	--	--	--	--	--	--	6.27	--	--
LL3-086	0 to 1	8.3	--	--	--	--	--	--	7.17	--	--
LL3-087	0 to 1	9.8	--	--	--	--	--	--	6.83	--	--
LL3-088	0 to 1	14.7	27	11	32.3	40.1	15.9	11.7	7.14	2.682	SC
LL3-089	0 to 1	16.4	34	16	8.0	25.6	33.8	32.9	5.59	2.686	CL
LL3-093	0 to 1	17.1	--	--	--	--	--	--	3.90	--	--
LL3-102	0 to 1	15.9	--	--	--	--	--	--	6.40	--	--
LL3-103	0 to 1	19.6	30	11	23.8	48.6	19.3	8.3	7.04	2.703	SC
LL3-105	0 to 1	22.0	--	--	--	--	--	--	5.89	--	--
LL3-106	0 to 1	18.2	--	--	--	--	--	--	5.61	--	--
LL3-113	0 to 1	15.4	--	--	--	--	--	--	7.23	--	--
LL3-119	0 to 1	18.0	--	--	--	--	--	--	6.40	--	--
LL3-121	0 to 1	17.3	--	--	--	--	--	--	6.92	--	--
LL3-128	0 to 1	21.2	--	--	--	--	--	--	6.48	--	--
LL3-129	0 to 1	25.7	33	16	19.3	43.3	20.6	16.8	7.04	2.682	SC
LL3-122	0 to 1	17.2	--	--	--	--	--	--	5.99	--	--

LL = Liquid limit.
PI = Plasticity index.
RI = Remedial Investigation.
USCS = Unified Soil Classification System.

4.2.3 Explosives and Propellants

4.2.3.1 Preparation and Receiving Area Aggregate

Twelve surface soil samples were analyzed in the field to determine the presence of TNT and/or RDX during the Phase II RI field effort. Four of 12 samples exhibited a field concentration of TNT greater than 1 mg/kg. Field analysis did not indicate detectable concentrations of RDX in any of the samples analyzed. The samples exceeding 1 mg/kg of TNT were located surrounding Building EB-3 and north-northwest of Building EB-803 (Figures 4-2, 4-3, and 4-4). In order to confirm the field explosive results, seven surface soil samples were collected and analyzed by a fixed-base laboratory for explosive compounds. Two of these seven samples were analyzed for nitrocellulose and nitroguanadine in addition to explosives. Three other samples from the Phase I RI, analyzed only for 2,4,6-TNT, HMX, and RDX are also considered in the summary statistics presented in Table 4-3. Five explosive compounds (Table 4-9) were detected and retained as SRCs in the surface soils associated with the Preparation and Receiving Area Aggregate. RDX was detected at a concentration of 31 mg/kg in the sample collected from station LL3-136, which is located on the northwest corner of Building EB-3. HMX was also detected at this station with a reported value of 1.9 mg/kg. The remaining three explosive compounds identified in this sample were all detected at concentrations less than 1 mg/kg.

Three explosive compounds 2,4,6-TNT, 2-amino-4,6-dinitrotoluene (DNT), and 4-amino-2,6-DNT were each detected in the sample collected from Station LL3-042, with 2,4,6-TNT being reported at a value of 1.2 mg/kg. All remaining explosive compounds were detected at concentrations less than 1 mg/kg. Table 4-9 provides a summary of the reported values for all explosive compounds.

Two surface soil samples were analyzed for the propellant compounds nitroguanidine and nitrocellulose. Detectable concentrations of each were identified in the sample collected from station LL3-137, which is located on the eastern side of Building EB-3 and only nitrocellulose was identified (27.9 mg/kg) in the sample collected from Station LL3-142. Station LL3-142 is located along the northeastern side of Building EB-803. Table 4-12 provides a summary of propellant compounds detected and Figures 4-2, 4-3, and 4-4 illustrate the distribution of all explosive and propellant compounds detected within the Load Line 3 surface soils.

4.2.3.2 Change Houses Aggregate

Six surface soil samples were analyzed in the field to determine concentrations of TNT and/or RDX during the Phase II RI. Field analysis did not indicate the presence of TNT or RDX at concentrations exceeding 1 mg/kg. Therefore, fixed-base laboratory confirmatory analysis of explosives and propellant compounds was not performed on the surface soils associated with the Change Houses Aggregate.

4.2.3.3 Explosives Handling Areas Aggregate

Eighty-one surface soil samples were analyzed in the field to determine the presence of TNT and/or RDX at the Explosives Handling Areas Aggregate during the Phase II RI. Sample station LL3-069 exhibited RDX concentrations exceeding 1 mg/kg and 29 additional sampling stations contained concentrations of TNT above 1 mg/kg. Detected TNT concentrations ranged from 1.1 mg/kg at station LL3-226 to 4,211 mg/kg at station LL3-063.

To confirm the field explosives analysis, 37 surface soil samples were analyzed by an off-site laboratory for explosive and/or propellant compounds (Table 4-3). Ten explosive compounds were identified and retained as SRCs in the surface soils associated with the Explosives Handling Areas Aggregate. Table 4-13 presents a summary of detected explosive compounds identified during the Phase II RI.

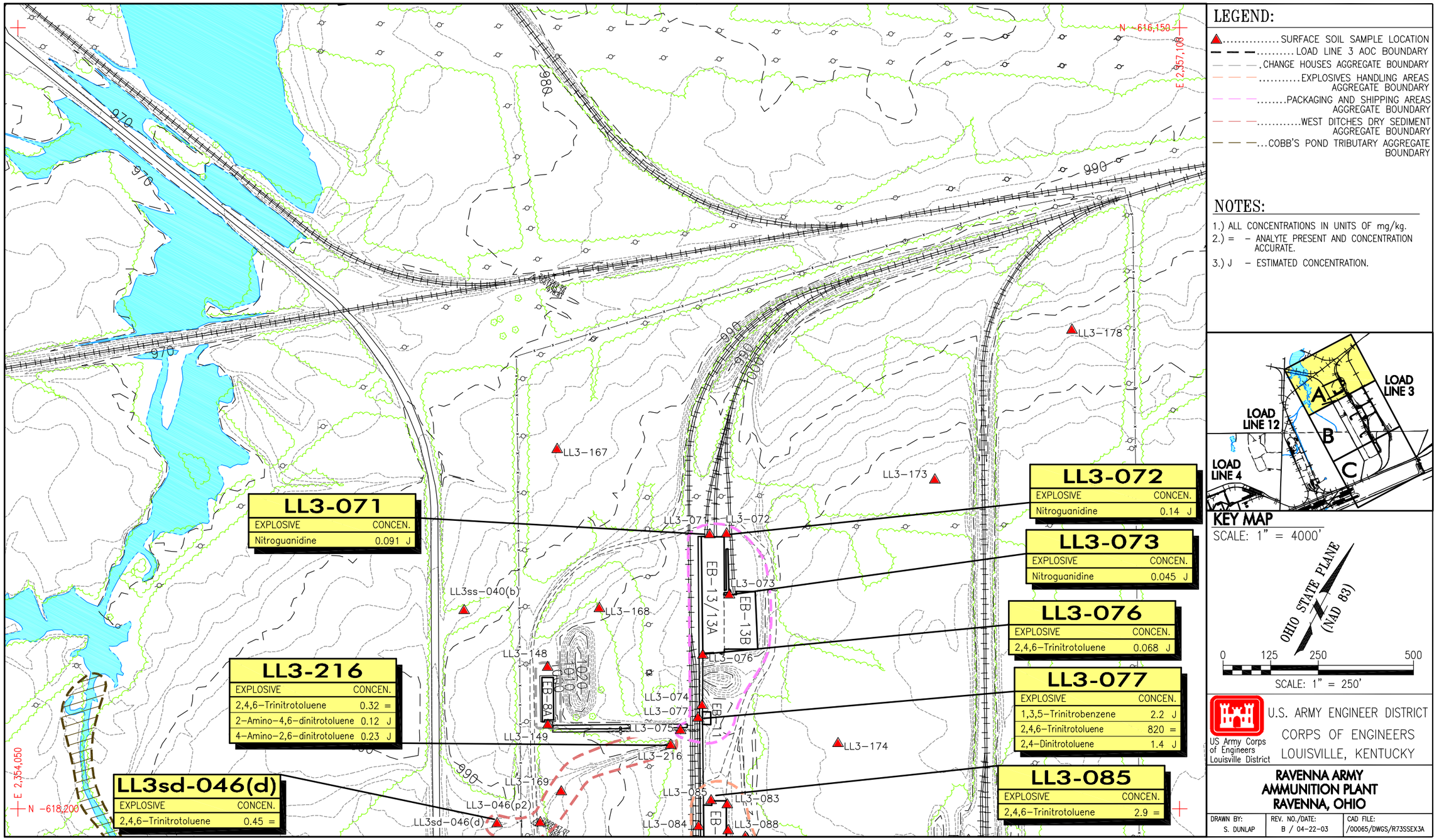


Figure 4-2. Distribution of Explosive and Propellant Compounds in Surface Soil at Load Line 3 - Northern Section

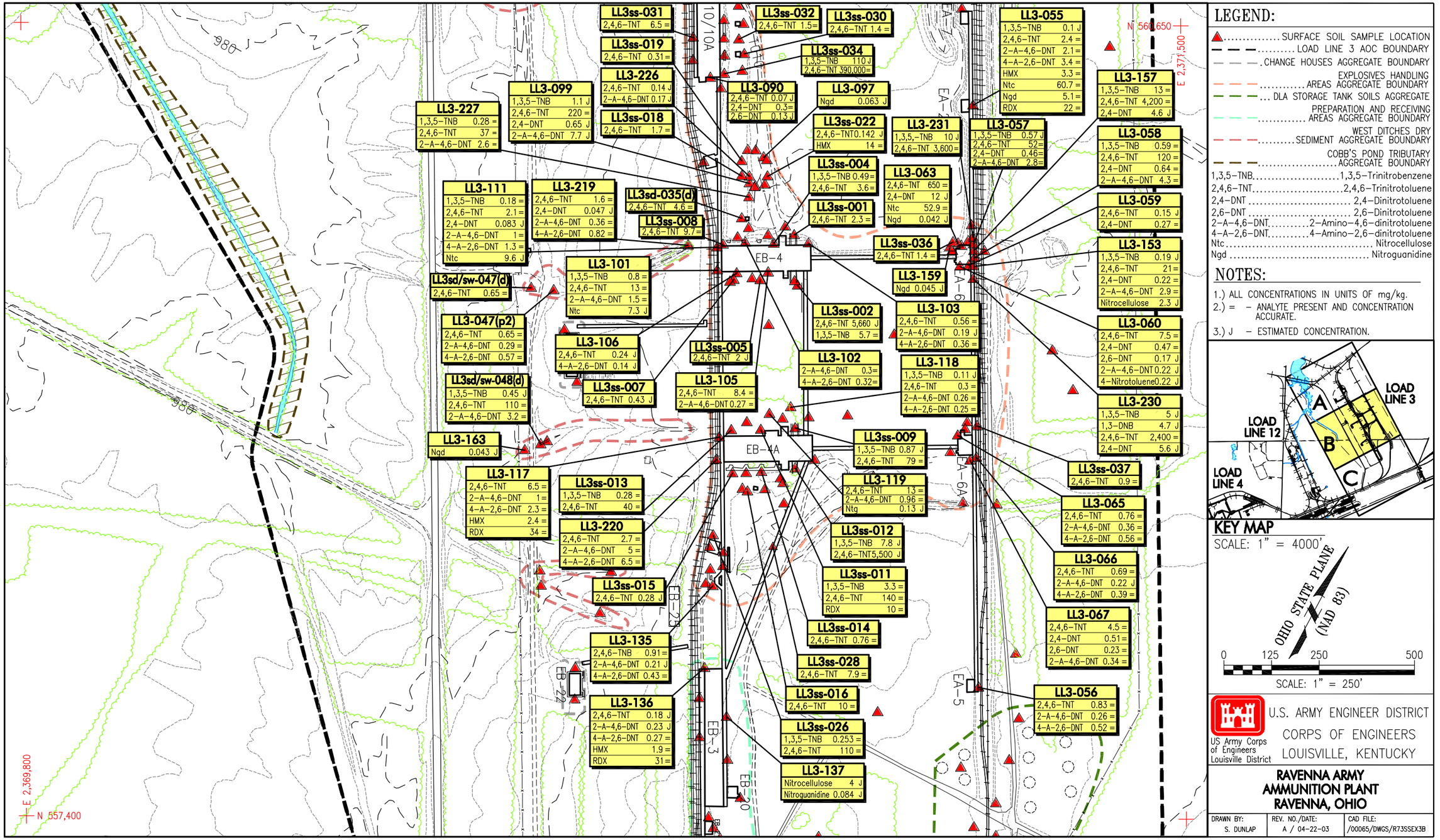
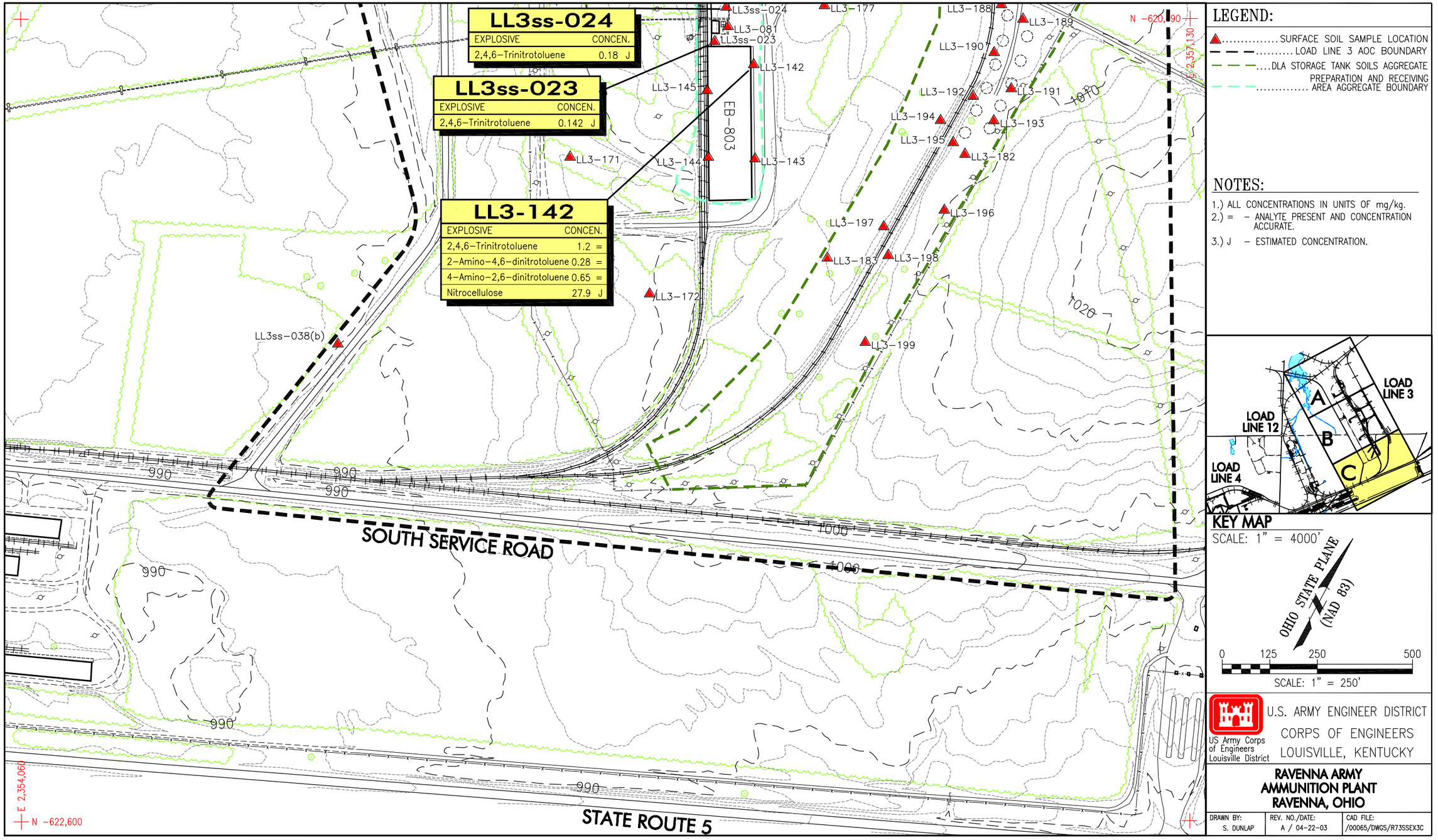


Figure 4-3. Distribution of Detected Explosives and Propellants in Surface Soil at Load Line 3 - Central Section



LEGEND:

- ▲ ..... SURFACE SOIL SAMPLE LOCATION
- — — — ..... LOAD LINE 3 AOC BOUNDARY
- — — — .... DLA STORAGE TANK SOILS AGGREGATE PREPARATION AND RECEIVING AREA AGGREGATE BOUNDARY

NOTES:

1.) ALL CONCENTRATIONS IN UNITS OF mg/kg.
2.) = – ANALYTE PRESENT AND CONCENTRATION ACCURATE.
3.) J – ESTIMATED CONCENTRATION.

KEY MAP
SCALE: 1" = 4000'

OHIO STATE PLANE (NAD 83)

0 125 250 500
SCALE: 1" = 250'

US Army Corps of Engineers Louisville District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE:
S. DUNLAP	A / 04-22-03	/00065/DWGS/R73SSEX3C

Figure 4-4. Distribution of Explosive and Propellant Compounds in Surface Soil at Load Line 3 - Southern Section

Table 4-12. Summary Data for Site-Related Explosive and Propellant Compounds in Preparation and Receiving Area Surface Soils at Load Line 3[a]

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-080**	**LL3-082**	**LL3-082**	**LL3-136**
Sample ID		**LL30754**	**LL30760**	**LL31126**	**LL30902**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Field Duplicate**	**Grab**
Analyte	**Units**				
Explosives					
2,4,6-Trinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.18 J
2-Amino-4,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.23 J
4-Amino-2,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.27 =
HMX	mg/kg	0.5 U	0.5 U	0.5 U	1.9 =
Nitrocellulose	mg/kg	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA
RDX	mg/kg	0.5 U	0.5 U	0.5 U	31 =

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-137**	**LL3-138**	**LL3-142**	**LL3-142**
Sample ID		**LL30905**	**LL30908**	**LL30918**	**LL31120**
Date		**08/10/2001**	**08/10/2001**	**08/09/2001**	**08/09/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**
Analyte	**Units**				
Explosives					
2,4,6-Trinitrotoluene	mg/kg	0.25 U	0.25 U	1.2 =	0.72 =
2-Amino-4,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.28 =	0.2 J
4-Amino-2,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.65 =	0.46 =
HMX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U
Nitrocellulose	mg/kg	4 J	NA	27.9 J	18.6 J
Nitroguanidine	mg/kg	0.084 J	NA	0.25 U	0.25 U
RDX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U

Table 4-12. Summary Data for Site-Related Explosive and Propellant Compounds in Preparation and Receiving Area Surface Soils at Load Line 3[a] (continued)

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-144**	**LL3ss-023**	**LL3ss-024**	**LL3ss-025**
Sample ID		**LL30924**	**LL3SS-023-0187-SO**	**LL3SS-024-0188-SO**	**LL3SS-025-0189-SO**
Date		**08/09/2001**	**07/23/1996**	**07/23/1996**	**07/23/1996**
Depth (ft)		**0 - 1**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**				
Explosives			NA	NA	NA
2,4,6-Trinitrotoluene	mg/kg	0.25 U	0.142 J	0.18 J	0.25 U
2-Amino-4,6-dinitrotoluene	mg/kg	0.25 U	NA	NA	NA
4-Amino-2,6-dinitrotoluene	mg/kg	0.25 U	NA	NA	NA
HMX	mg/kg	0.5 U	2 U	2 U	2 U
Nitrocellulose	mg/kg	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA
RDX	mg/kg	0.5 U	1 U	1 U	1 U

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
NA = Not analyzed.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
= - Detected result.
J - Estimated result.
U - Not detected.

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a]

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-057**	**LL3-057**	**LL3-058**	**LL3-059**	**LL3-060**
Sample ID		**LL30693**	**LL31121**	**LL30696**	**LL30699**	**LL30702**
Date		**07/31/2001**	**07/31/2001**	**07/31/2001**	**07/31/2001**	**07/31/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Field Duplicate**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.57 =	0.7 =	0.59 =	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.5 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	52 =	40 =	120 =	0.15 J	7.5 =
2,4-Dinitrotoluene	mg/kg	0.46 =	0.69 =	0.64 =	0.27 =	0.47 =
2,6-Dinitrotoluene	mg/kg	0.49 U	0.39 U	0.65 U	0.25 U	0.17 J
2-Amino-4,6-dinitrotoluene	mg/kg	2.8 =	2.2 =	4.3 =	0.25 U	0.22 J
4-Amino-2,6-dinitrotoluene	mg/kg	8.1 U	5.5 U	14 U	0.25 U	0.25 U
4-Nitrotoluene	mg/kg	0.25 U	0.39 U	0.5 U	0.25 U	0.22 J
HMX	mg/kg	0.5 U	0.5 U	1 U	0.5 U	0.5 U
Nitrocellulose	mg/kg	NA	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA	NA
RDX	mg/kg	0.5 U	0.5 U	1 U	0.5 U	0.5 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-063**	**LL3-065**	**LL3-066**	**LL3-067**	**LL3-085**
Sample ID		**LL30707**	**LL30713**	**LL30716**	**LL30719**	**LL30769**
Date		**07/31/2001**	**08/07/2001**	**08/08/2001**	**07/31/2001**	**08/06/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	650 =	0.76 =	0.69 =	4.5 =	2.9 =
2,4-Dinitrotoluene	mg/kg	12 J	0.25 U	0.25 U	0.51 =	0.25 U
2,6-Dinitrotoluene	mg/kg	25 U	0.25 U	0.25 U	0.23 J	0.25 U
2-Amino-4,6-dinitrotoluene	mg/kg	25 U	0.36 =	0.22 J	0.34 =	0.25 U
4-Amino-2,6-dinitrotoluene	mg/kg	250 U	0.56 =	0.39 =	1.4 U	0.95 U
4-Nitrotoluene	mg/kg	25 U	0.25 U	0.25 U	0.25 U	1.1 U
HMX	mg/kg	50 U	0.5 U	0.5 U	0.5 U	0.5 U
Nitrocellulose	mg/kg	52.9 =	NA	NA	NA	NA
Nitroguanidine	mg/kg	0.042 J	NA	NA	NA	NA
RDX	mg/kg	50 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-090**	**LL3-092**	**LL3-097**	**LL3-097**	**LL3-099**
Sample ID		**LL30784**	**LL30790**	**LL30799**	**LL31119**	**LL30805**
Date		**08/01/2001**	**08/07/2001**	**08/07/2001**	**08/07/2001**	**08/07/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**	**Grab**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	1.1 J
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.75 U
2,4,6-Trinitrotoluene	mg/kg	0.07 J	0.25 U	0.25 U	0.25 U	220 =
2,4-Dinitrotoluene	mg/kg	0.3 =	0.25 U	0.25 U	0.25 U	0.65 J
2,6-Dinitrotoluene	mg/kg	0.13 J	0.25 U	0.25 U	0.25 UJ	2 U
2-Amino-4,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 UJ	7.7 J
4-Amino-2,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	72 U
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.75 U
HMX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	1.5 U
Nitrocellulose	mg/kg	NA	NA	2 U	2 U	2 UJ
Nitroguanidine	mg/kg	NA	NA	0.063 J	0.25 UJ	0.25 U
RDX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	1.5 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-101**	**LL3-102**	**LL3-103**	**LL3-104**	**LL3-105**
Sample ID		**LL30811**	**LL30814**	**LL30817**	**LL30820**	**LL30823**
Date		**08/11/2001**	**08/07/2001**	**08/07/2001**	**08/08/2001**	**08/08/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.8 =	0.25 U	0.25 U	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	13 =	0.25 U	0.56 =	0.25 U	8.4 =
2,4-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Amino-4,6-dinitrotoluene	mg/kg	1.5 =	0.3 =	0.19 J	0.25 U	0.27 =
4-Amino-2,6-dinitrotoluene	mg/kg	4.3 U	0.32 =	0.36 =	0.25 U	4.3 U
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Nitrocellulose	mg/kg	7.3 J	NA	NA	NA	NA
Nitroguanidine	mg/kg	0.25 U	NA	NA	NA	NA
RDX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-106**	**LL3-111**	**LL3-117**	**LL3-118**	**LL3-119**
Sample ID		**LL30826**	**LL30833**	**LL30851**	**LL30854**	**LL30857**
Date		**08/08/2001**	**08/08/2001**	**08/06/2001**	**08/07/2001**	**08/07/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.18 J	0.25 U	0.11 J	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.24 J	2.1 =	6.5 =	0.3 =	13 =
2,4-Dinitrotoluene	mg/kg	0.25 U	0.083 J	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Amino-4,6-dinitrotoluene	mg/kg	0.25 U	1 =	1 =	0.26 =	0.96 =
4-Amino-2,6-dinitrotoluene	mg/kg	0.14 J	1.3 =	2.3 =	0.25 =	7.2 U
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	0.5 U	0.5 U	2.4 =	0.5 U	0.5 U
Nitrocellulose	mg/kg	NA	9.6 J	NA	NA	2 UJ
Nitroguanidine	mg/kg	NA	0.25 U	NA	NA	0.13 J
RDX	mg/kg	0.5 U	0.5 U	34 =	0.5 U	0.5 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-126**	**LL3-127**	**LL3-127**	**LL3-132**	**LL3-135**
Sample ID		**LL30872**	**LL30875**	**LL31123**	**LL30890**	**LL30899**
Date		**08/07/2001**	**08/07/2001**	**08/07/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Field Duplicate**	**Grab**	**Grab**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.91 =
2,4-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Amino-4,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.21 J
4-Amino-2,6-dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.43 =
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Nitrocellulose	mg/kg	NA	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA	NA
RDX	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-153**	**LL3-157**	**LL3-158**	**LL3-159**	**LL3-220**
Sample ID		**LL30951**	**LL30963**	**LL30966**	**LL30969**	**LL31075**
Date		**08/13/2001**	**08/13/2001**	**08/13/2001**	**08/13/2001**	**08/07/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.19 J	13 =	0.25 U	NA	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	12 U	0.25 U	NA	0.25 U
2,4,6-Trinitrotoluene	mg/kg	21 =	4,200 =	0.25 U	NA	2.7 =
2,4-Dinitrotoluene	mg/kg	0.22 J	4.6 J	0.25 U	NA	0.25 U
2,6-Dinitrotoluene	mg/kg	0.39 U	12 U	0.25 U	NA	0.25 U
2-Amino-4,6-dinitrotoluene	mg/kg	2.9 =	27 U	0.25 U	NA	5 =
4-Amino-2,6-dinitrotoluene	mg/kg	8.4 U	850 U	0.25 U	NA	6.5 =
4-Nitrotoluene	mg/kg	0.25 U	12 U	0.25 U	NA	1 U
HMX	mg/kg	0.5 U	25 U	0.5 U	NA	0.5 U
Nitrocellulose	mg/kg	2.3 J	NA	NA	2 UJ	NA
Nitroguanidine	mg/kg	0.25 U	NA	NA	0.045 J	NA
RDX	mg/kg	0.5 U	25 U	0.5 U	NA	0.5 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-226**	**LL3-227**	**LL3-230**	**LL3-231**	**LL3sd-035(d)**
Sample ID		**LL31092**	**LL31093**	**LL31098**	**LL31099**	**LL3SD-035(D)-0201-SD**
Date		**08/24/2001**	**08/24/2001**	**08/24/2001**	**08/24/2001**	**07/27/1996**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 0**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab Composite**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.28 =	5 J	10 J	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	4.7 J	12 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.14 J	37 =	2,400 =	3,600 =	4.6 =
2,4-Dinitrotoluene	mg/kg	0.25 U	0.29 U	5.6 J	12 U	0.25 UJ
2,6-Dinitrotoluene	mg/kg	0.25 U	0.56 U	12 U	12 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg	0.25 U	2.6 =	12 U	12 U	NA
4-Amino-2,6-dinitrotoluene	mg/kg	0.17 J	8.4 U	120 U	120 U	NA
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	12 U	12 U	0.25 U
HMX	mg/kg	0.5 U	0.5 U	25 U	25 U	2 U
Nitrocellulose	mg/kg	NA	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA	NA
RDX	mg/kg	0.5 U	0.5 U	25 U	25 U	1 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3sd-035(d)**	**LL3sd-042**	**LL3ss-001**	**LL3ss-002**	**LL3ss-003**
Sample ID		**LL3SD-035(D)-0202-FD**	**LL3SD-042-0209-SD**	**LL3SS-001-0161-SO**	**LL3SS-002-0162-SO**	**LL3SS-003-0163-SO**
Date		**07/27/1996**	**08/20/1996**	**07/25/1996**	**07/24/1996**	**07/26/1996**
Depth (ft)		**0 - 0**	**0 - 1**	**0 - 1**	**0 - 2**	**0 - 1**
Sample Type		**Field Duplicate**	**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	5.7 =	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	1.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	3.3 =	0.25 U	2.3 =	5,660 J	0.25 U
2,4-Dinitrotoluene	mg/kg	0.25 UJ	0.25 UJ	0.25 U	1.25 UJ	0.25 U
2,6-Dinitrotoluene	mg/kg	0.26 U	0.26 U	0.26 U	1.3 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	1.25 U	0.25 U
HMX	mg/kg	2 U	2 U	2 U	10 U	2 U
Nitrocellulose	mg/kg	NA	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA	NA
RDX	mg/kg	1 U	1 U	1 U	5 U	1 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-003**	**LL3ss-004**	**LL3ss-005**	**LL3ss-006**	**LL3ss-007**
Sample ID		**LL3SS-003-0164-FD**	**LL3SS-004-0166-SO**	**LL3SS-005-0167-SO**	**LL3SS-006-0168-SO**	**LL3SS-007-0169-SO**
Date		**07/26/1996**	**07/25/1996**	**07/24/1996**	**07/25/1996**	**07/24/1996**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Field Duplicate**	**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.49 =	0.25 U	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.25 U	3.6 =	2 J	0.25 U	0.43 J
2,4-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 UJ	0.25 U	0.25 UJ
2,6-Dinitrotoluene	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	2 U	2 U	2 U	2 U	2 U
Nitrocellulose	mg/kg	NA	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA	NA
RDX	mg/kg	1 U	1 U	1 U	1 U	1 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-008**	**LL3ss-008**	**LL3ss-009**	**LL3ss-010**	**LL3ss-011**
Sample ID		**LL3SS-008-0170-SO**	**LL3SS-008-0174-FD**	**LL3SS-009-0171-SO**	**LL3SS-010-0172-SO**	**LL3SS-011-0173-SO**
Date		**07/25/1996**	**07/25/1996**	**07/24/1996**	**07/24/1996**	**07/24/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab Composite**	**Field Duplicate**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.87 J	0.25 U	3.3 =
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	9.7 =	0.82 J	79 =	0.25 U	140 =
2,4-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 UJ	0.25 U	0.25 UJ
2,6-Dinitrotoluene	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	2 U	2 U	2 U	2 U	2 U
Nitrocellulose	mg/kg	NA	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA	NA
RDX	mg/kg	1 U	1 U	1 U	1 U	10 =

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-012**	**LL3ss-013**	**LL3ss-014**	**LL3ss-015**	**LL3ss-016**
Sample ID		**LL3SS-012-0175-SO**	**LL3SS-013-0176-SO**	**LL3SS-014-0177-SO**	**LL3SS-015-0178-SO**	**LL3SS-016-0179-SO**
Date		**07/24/1996**	**07/24/1996**	**07/24/1996**	**07/24/1996**	**07/24/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 1**	**0 - 2**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	7.8 J	0.28 =	0.25 U	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	12.5 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	5500 J	40 =	0.76 =	0.28 J	10 =
2,4-Dinitrotoluene	mg/kg	12.5 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ
2,6-Dinitrotoluene	mg/kg	13 U	0.26 U	0.26 U	0.26 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg					
4-Amino-2,6-dinitrotoluene	mg/kg					
4-Nitrotoluene	mg/kg	12.5 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	100 U	2 U	2 U	2 U	2 U
Nitrocellulose	mg/kg					
Nitroguanidine	mg/kg					
RDX	mg/kg	50 U	1 U	1 U	1 U	1 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-017**	**LL3ss-018**	**LL3ss-019**	**LL3ss-020**	**LL3ss-020**
Sample ID		**LL3SS-017-0180-SO**	**LL3SS-018-0181-SO**	**LL3SS-019-0182-SO**	**LL3SS-020-0183-SO**	**LL3SS-020-0184-FD**
Date		**07/25/1996**	**07/25/1996**	**07/25/1996**	**07/25/1996**	**07/25/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**	**0 - 1**	**0 - 1**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**	**Field Duplicate**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.25 U	1.7 =	0.31 =	0.25 U	0.25 U
2,4-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg					
4-Amino-2,6-dinitrotoluene	mg/kg					
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	2 U	2 U	2 U	2 U	14 =
Nitrocellulose	mg/kg					
Nitroguanidine	mg/kg					
RDX	mg/kg	1 U	1 U	1 U	1 U	1 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-021**	**LL3ss-022**	**LL3ss-026**	**LL3ss-026**	**LL3ss-027**
Sample ID		**LL3SS-021-0185-SO**	**LL3SS-022-0186-SO**	**LL3SS-026-0190-SO**	**LL3SS-026-0191-FD**	**LL3SS-027-0193-SO**
Date		**07/25/1996**	**07/25/1996**	**07/25/1996**	**07/25/1996**	**07/27/1996**
Depth (ft)		**0 - 0**	**0 - 2**	**0 - 1**	**0 - 1**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Field Duplicate**	**Grab Composite**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.253 =	0.2 J	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.25 U	0.57 =	110 =	8.1 =	0.25 U
2,4-Dinitrotoluene	mg/kg	0.25 U	0.25 U	0.25 UJ	0.25 UJ	0.25 UJ
2,6-Dinitrotoluene	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg					
4-Amino-2,6-dinitrotoluene	mg/kg					
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	2 U	14 =	2 U	2 U	2 U
Nitrocellulose	mg/kg					
Nitroguanidine	mg/kg					
RDX	mg/kg	1 U	1 U	1 U	1 U	1 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-028**	**LL3ss-029**	**LL3ss-030**	**LL3ss-031**	**LL3ss-032**
Sample ID		**LL3SS-028-0194-SO**	**LL3SS-029-0195-SO**	**LL3SS-030-0196-SO**	**LL3SS-031-0197-SO**	**LL3SS-032-0198-SO**
Date		**07/27/1996**	**07/26/1996**	**07/26/1996**	**07/26/1996**	**07/26/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	7.9 =	0.25 U	1.4 =	6.5 =	1.5 =
2,4-Dinitrotoluene	mg/kg	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	NA	NA	NA
4-Nitrotoluene	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	mg/kg	2 U	2 U	2 U	2 U	2 U
Nitrocellulose	mg/kg	NA	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA	NA
RDX	mg/kg	1 U	1 U	1 U	1 U	1 U

Table 4-13. Summary Data for Site-Related Explosives and Propellants in the Explosives Handling Areas Aggregate Surface Soils[a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-033**	**LL3ss-034**	**LL3ss-036**	**LL3ss-037**
Sample ID		**LL3SS-033-0199-SO**	**LL3SS-034-0200-SO**	**LL3SS-036-0203-SO**	**LL3SS-037-0204-SO**
Date		**07/26/1996**	**07/26/1996**	**07/26/1996**	**07/26/1996**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**				
Explosives					
1,3,5-Trinitrobenzene	mg/kg	0.25 U	110 J	0.25 U	0.25 U
1,3-Dinitrobenzene	mg/kg	0.25 U	1,250 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.25 U	390,000 =	1.4 =	0.9 =
2,4-Dinitrotoluene	mg/kg	0.25 U	1,250 U	0.25 U	0.25 U
2,6-Dinitrotoluene	mg/kg	0.26 U	1,300 U	0.26 U	0.26 U
2-Amino-4,6-dinitrotoluene	mg/kg	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	NA	NA
4-Nitrotoluene	mg/kg	0.25 U	1,250 U	0.25 U	0.25 U
HMX	mg/kg	2 U	10,000 U	2 U	2 U
Nitrocellulose	mg/kg	NA	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA	NA
RDX	mg/kg	1 U	5,000 U	1 U	1 U

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
The following Phase I stations are shown on Figure 4-3 but not in this table: LL3ss-012, LL3ss-013, LL3ss-014, LL3ss-015, LL3ss-016, LL3ss-018, LL3ss-019, LL3ss-022, and LL3ss-026.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
NA = Not analyzed.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
= - Detected result.
J - Estimated result.
U - Not detected.

At least one explosive compound was identified in 32 of the samples collected. The most pervasive compounds were 2,4,6-TNT; 2,4 DNT; and 2-amino-4,6-DNT.

2,4,6-TNT was detected at a concentration of 390,000 mg/kg in the sample collected from the Phase I RI station LL3ss-034, far exceeding any other Phase I or II RI concentration detected. Station LL3ss-034 was collected from a vacuum pump housing east of Building EB-10 (Figure 4-3). Additional significant concentrations of TNT were identified at stations LL3-230 (2,400 mg/kg), LL3-231 (3,600 mg/kg), and LL3-157 (4,200 mg/kg), which surround Building EA-6, and Phase RI sampling locations LL3ss-012 (5,500 mg/kg) and LL3ss-002 (5,660 mg/kg), which are located in the vicinity of Buildings EB-4A and EB-6, respectively.

The highest concentration of 2,4-DNT was identified (12 mk/kg) in the sample collected from station LL3-063, which is located west of Building EA-6. The highest concentration of 2-amino-4,6-DNT (7.7 mg/kg) was reported in the sample collected from station LL3-099 located north of Building EB-4.

The propellant compounds nitrocellulose and nitroguanidine were detected at four locations each. Primarily, propellant compounds were detected in the vicinity of Building EA-6 with additional concentrations identified near Buildings EB-4 and EB-4A.

Sample station LL3-063 contained the highest concentration (52.9 kg/kg) of nitrocellulose detected, which is located on the west side of Building EA-6. Nitroguanidine was identified in the soil/sediment sample collected from the settling basin near EB-10 (Figures 4-2, 4-3, and 4-4). All concentrations of nitroguanidine, however, were detected at concentrations less than 1 mg/kg. Table 4-10 presents a summary of detected propellant compounds identified during the Phase II RI.

4.2.3.4 Packaging and Shipping Areas Aggregate

Seven surface soil samples were analyzed in the field to determine concentrations of TNT and/or RDX during the Phase II RI. Field analysis indicated the presence of TNT in only one sample at a concentration exceeding 1 mg/kg. The sample was collected from station LL3-077 at a concentration of 848 mg/kg. RDX was not detected through the field explosives analysis.

In order to confirm the field explosives analysis, three surface soil samples were analyzed by an off-site laboratory for explosive compounds. A total of six samples were additionally analyzed for propellants. Three explosive compounds were identified and retained as SRCs in the surface soils associated with the Packaging and Shipping Areas Aggregate (Table 4-3).

2,4,6-TNT was detected at two locations (LL3-077 and LL3-076) while the remaining explosives were detected only in the sample collected from station LL3-077. The highest detected concentration (820 mg/kg) for 2,4,6-TNT was reported at station LL3-077, which is located to the west of Building EB-11, along the railroad track.

The propellant nitroguanidine was identified and retained as an SRC in the surface soils associated with the Packaging and Shipping Areas Aggregate. Nitroguanidine was identified at three locations, LL3-071, LL3-072, and LL3-073, with all concentrations being less than 1 mg/kg. Table 4-14 presents a summary of all detected explosive and propellant compounds and Figure 4-3 illustrates the distribution of explosive and propellant compounds associated with the Packaging and Shipping Areas Aggregate. These chemicals were selected based on highest frequency of detection and/or magnitude of concentration above background, as explained in Section 4.1.4.

Table 4-14. Summary Data of Site-Related Explosives and Propellants in the Packaging and Shipping Area Aggregate at Load Line 3

Functional Area		Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate
Station ID		**LL3-071**	**LL3-072**	**LL3-073**	**LL3-074**	**LL3-074**
Sample ID		**LL30727**	**LL30730**	**LL30733**	**LL30736**	**LL31124**
Date		**08/08/2001**	**08/09/2001**	**08/09/2001**	**08/09/2001**	**08/09/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Field Duplicate**
Analyte	**Units**					
Explosives						
1,3,5-Trinitrobenzene	mg/kg	NA	NA	NA	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	NA	NA	NA	0.25 U	0.25 U
2,4-Dinitrotoluene	mg/kg	NA	NA	NA	0.25 U	0.25 U
Nitroguanidine	mg/kg	0.091 J	0.14 J	0.045 J	0.25 U	NA

Functional Area		Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate
Station ID		**LL3-075**	**LL3-076**	**LL3-077**
Sample ID		**LL30739**	**LL30742**	**LL30745**
Date		**08/09/2001**	**08/09/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**
Analyte	**Units**			
Explosives				
1,3,5-Trinitrobenzene	mg/kg	NA	0.25 U	2.2 J
2,4,6-Trinitrotoluene	mg/kg	NA	0.068 J	820 =
2,4-Dinitrotoluene	mg/kg	NA	0.25 U	1.4 J
Nitroguanidine	mg/kg	0.25 U	0.25 UJ	NA

ID = Identification.
NA = Not analyzed.
= - Detected result.
J - Estimated result.
U - Not detected.

4.2.3.5 DLA Storage Tanks Aggregate

Field explosive analysis was conducted at 15 sampling locations throughout the DLA Storage Tanks Area Aggregate. The field laboratory analysis did not identify TNT or RDX at concentrations exceeding 1 mg/kg.

In order to confirm the field explosives analysis, two surface soil samples were submitted to the fixed-based laboratory for analysis of explosive compounds. There were no explosive compounds identified at detectable concentrations. Table 4-15 provides the sample locations where confirmatory soil samples were collected.

Table 4-15. Confirmatory Surface Soil Sampling Locations for Explosives in the DLA Storage Tanks Aggregate

Station ID	Explosive Compounds
LL3-188	All non-detect
LL3-193	All non-detect

ID = Identification.
DLA = Defense Logistics Agency.

4.2.3.6 West Ditches Aggregate

Surface soil and dry sediment samples were collected from the West Ditches Aggregate during the Phase II RI field activities. As discussed in Section 4.1, for discussion purposes, the dry sediment samples will be considered as surface soil samples.

Field explosive analysis was conducted at two sampling locations (LL3-169 and LL3-170) associated with the West Ditches Aggregate. The field laboratory analysis did not identify TNT or RDX at concentrations exceeding 1 mg/kg.

In order to confirm the field explosives analysis, five surface soil/dry sediment samples were submitted to a fixed-base laboratory for analysis of explosive compounds. Five samples from the Phase I RI provide additional data for 1,3,5-TNT, 2,4,6-TNT, and 2,4-DNT. Five explosive compounds were identified and retained as SRCs in the surface soils/dry ditch sediments associated with the West Ditches Aggregate. 2,4,6-TNT was most pervasive appearing in 70% of the samples analyzed.

The highest concentration of 2,4,6-TNT (110 mg/kg) was identified in the sample collected from station LL3sd/sw-048(d) (Phase I RI Station). This location also exhibited the highest detected concentration of 2-amino-2,6-DNT (3.2 mg/kg). This station was located along the western tip of the central ditch, just south of Building EB-8.

Phase II RI sampling station LL3-219, located on the eastern tip of the West Ditch to the north of Building EB-8, contained four explosive compounds including 2,4,6-TNT at a concentration of 1.6 mg/kg. All remaining explosive compounds detected were present at concentrations less than 1 mg/kg. Table 4-16 provides a summary of all detected explosive compounds identified in the West Ditches Surface Soil Aggregate.

The distribution of explosive compounds identified within the West Ditches Aggregate is illustrated on Figures 4-2, 4-3, and 4-4.

Table 4-16. Summary Data Site-Related Explosives and Propellants in the West Ditches Aggregate at Load Line 3 [a]

Functional Area		West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate
Station ID		LL3-047(p2)	LL3-050(p2)	LL3-163	LL3-216
Sample ID		LL31069	LL31084	LL30981	LL31064
Date		08/08/2001	08/08/2001	08/13/2001	08/07/2001
Depth (ft)		0 - 1	0 - 1	0 - 1	0 - 1
Sample Type		Grab	Grab	Grab	Grab
Analyte	Units				
Explosives					
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	NA	0.25 U
2,4,6-Trinitrotoluene	mg/kg	0.65 =	0.25 U	NA	0.32 =
2,4-Dinitrotoluene	mg/kg	0.25 U	0.25 U	NA	0.25 U
2-Amino-4,6-dinitrotoluene	mg/kg	0.29 =	0.25 U	NA	0.12 J
4-Amino-2,6-dinitrotoluene	mg/kg	0.57 =	0.25 U	NA	0.23 J
Nitroguanidine	mg/kg	NA	NA	0.043 J	NA

Functional Area		West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate
Station ID		LL3-219	LL3sd-046(d)	LL3sd/sw-047(d)	LL3sd/sw-048(d)
Sample ID		LL31068	LL3SD-046(D)-0213-SD	LL3SD-047(D)-0214-SD	LL31077
Date		08/07/2001	07/27/1996	07/27/1996	08/08/2001
Depth (ft)		0 - 1	0 - 2	0 - 2	0 - 1
Sample Type		Grab	Grab Composite	Grab Composite	Grab
Analyte	Units				
Explosives					
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U	0.45 J
2,4,6-Trinitrotoluene	mg/kg	1.6 =	0.45 =	0.65 =	110 =
2,4-Dinitrotoluene	mg/kg	0.047 J	0.25 UJ	0.25 UJ	0.5 U
2-Amino-4,6-dinitrotoluene	mg/kg	0.36 =	NA	NA	3.2 =
4-Amino-2,6-dinitrotoluene	mg/kg	0.82 =	NA	NA	27 U
Nitroguanidine	mg/kg	NA	NA	NA	NA

Table 4-16. Summary Data Site-Related Explosives and Propellants in the West Ditches Aggregate at Load Line 3 [a] (continued)

Functional Area		West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate
Station ID		LL3sd/sw-048(d)	LL3sd/sw-049(d)	LL3sd/sw-050(d)
Sample ID		LL3SD-048(D)-0215-SD	LL3SD-049(D)-0216-SD	LL3SD-050(D)-0217-SD
Date		07/27/1996	07/27/1996	07/27/1996
Depth (ft)		0 - 2	0 - 2	0 - 2
Sample Type		Grab Composite	Grab Composite	Grab Composite
Analyte	Units			
Explosives				
1,3,5-Trinitrobenzene	mg/kg	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	mg/kg	1.1 =	0.25 U	0.25 =
2,4-Dinitrotoluene	mg/kg	0.25 UJ	0.25 UJ	0.25 UJ
2-Amino-4,6-dinitrotoluene	mg/kg	NA	NA	NA
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	NA
Nitroguanidine	mg/kg	NA	NA	NA

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
ID = Identification.
NA = Not analyzed.
= - Detected result.
J - Estimated result.
U - Not detected.

One sample collected from the West Ditches Aggregate (LL3-163) was analyzed for propellant compounds. Nitroguanidine was detected at a concentration of 0.043 mg/kg (Table 4-16). LL3-163 is located at the western tip of the West Ditch, just south of Building EB-8 (Figure 4-3). Table 4-13 presents a summary of all detected explosive and propellant compounds identified in the West Ditches Aggregate.

4.2.3.7 Perimeter Area Aggregate

Field explosives analysis was performed at 15 surface soil locations within the Perimeter Area Aggregate. Of those locations, two (LL3-055 and LL3-056) exceeded 1 mg/kg of TNT. Detectable concentrations of RDX were not identified through field explosive analysis.

In order to confirm the field explosives analysis, two samples were analyzed by a fixed-base analytical laboratory for the presence of explosive compounds. One additional sample from the Phase I RI provides additional data for explosives. As presented in Table 4-3, six explosive compounds were detected and retained as SRCs in the surface soils associated with the Perimeter Area Aggregate. The majority of explosive compounds were identified in the sample collected from station LL3-055, which is located along the northwestern side of Building EA-21. This sample also contained the highest concentrations of each detected explosive compound including RDX, which was identified at a concentration of 22 mg/kg. All explosive concentrations reported at station LL3-056 were below 1 mg/kg (Table 4-17).

One sample was collected from the Perimeter Area Aggregate and submitted for analysis of propellant compounds. Two compounds, nitrocellulose and nitroguanidine, were identified and retained as SRCs. Nitrocellulose was identified at a concentration of 60.7 mg/kg and nitroguanidine was identified at a concentration of 5.1 mg/kg in the sample collected from station LL3-055 (Table 4-17). The distribution of all explosive and propellant compounds identified in the surface soil associated with Load Line 3 is illustrated on Figures 4-2, 4-3, and 4-4.

4.2.4 Inorganic Constituents

Table 4-3 provides summary statistics for all inorganic parameters detected across each aggregate at Load Line 3. As discussed in Section 4.1, the essential nutrients calcium, iron, magnesium, potassium, and sodium were eliminated as SRCs in each aggregate at Load Line 3. Therefore, essential nutrient compounds will not be included in the aggregate-specific discussions. For those compounds with no established criteria, i.e., cadmium, cyanide, silver, and thallium, each will be retained as SRCs where identified at detectable concentrations. Inorganic SRC distribution figures have been prepared for cadmium (Figures 4-5, 4-6, and 4-7), lead (Figures 4-8, 4-9, and 4-10), and zinc (Figures 4-11, 4-12, and 4-13). These specific metals were selected as they were widely distributed throughout the Load Line 3 surface soils and are they closely related to past process operations.

4.2.4.1 Preparation and Receiving Area Aggregate

A total of 13 surface soil samples were submitted to a fixed-base laboratory for analysis of TAL metals and three samples were submitted for analysis of cyanide during the Phase II RI. As presented in Table 4-3, 18 metals plus cyanide were detected at least once in surface soil samples collected from the Preparation and Receiving Area Aggregate. Of these, three metals were eliminated as SRCs (aluminum, selenium, and vanadium) as all concentrations were detected below the established background concentrations.

For those metals retained as SRCs in surface soil, 10 were detected in 15 of 15 surface samples collected. Cadmium, copper, lead, thallium, and zinc were detected most frequently above background, while arsenic and manganese were detected at the lowest frequencies above background. Table 4-18 provides a summary of all metals detected in the surface soil samples associated with the Preparation and Receiving Area.

Table 4-17. Summary Data for Site-Related Explosives and Propellants in Perimeter Area Aggregate Surface Soil Load Line 3

Functional Area		Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate
Station ID		**LL3-055**	**LL3-056**	**LL3-171**
Sample ID		**LL30687**	**LL30690**	**LL30997**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**
Analyte	**Units**			
Explosives and Propellants				
1,3,5-Trinitrobenzene	mg/kg	0.1J	0.25U	0.25U
2,4,6-Trinitrotoluene	mg/kg	2.4=	0.83=	0.25U
2-Amino-4,6-Dinitrotoluene	mg/kg	2.1=	0.26=	0.25U
4-Amino-2,6-Dinitrotoluene	mg/kg	3.4=	0.52=	0.25U
HMX	mg/kg	3.3=	0.5U	0.5U
Nitrocellulose	mg/kg	60.7=	NA	NA
Nitroguanidine	mg/kg	5.1=	NA	NA
RDX	mg/kg	22=	0.5U	0.5U

HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
NA = Not analyzed.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
= - Detected result
J - Estimated result
U - Not detected

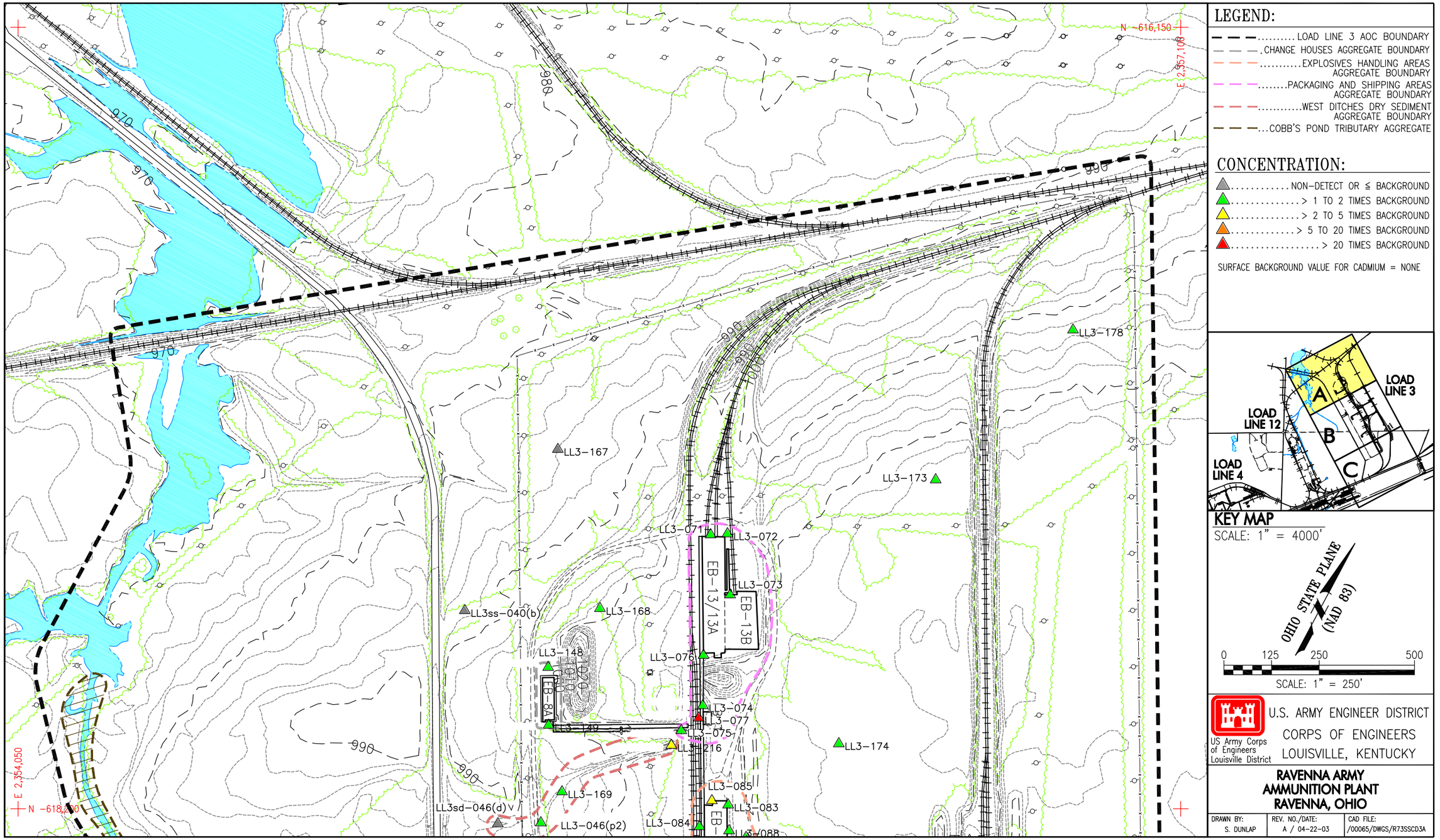


Figure 4-5. Distribution of Cadmium in Surface Soil at Load Line 3 - Northern Section

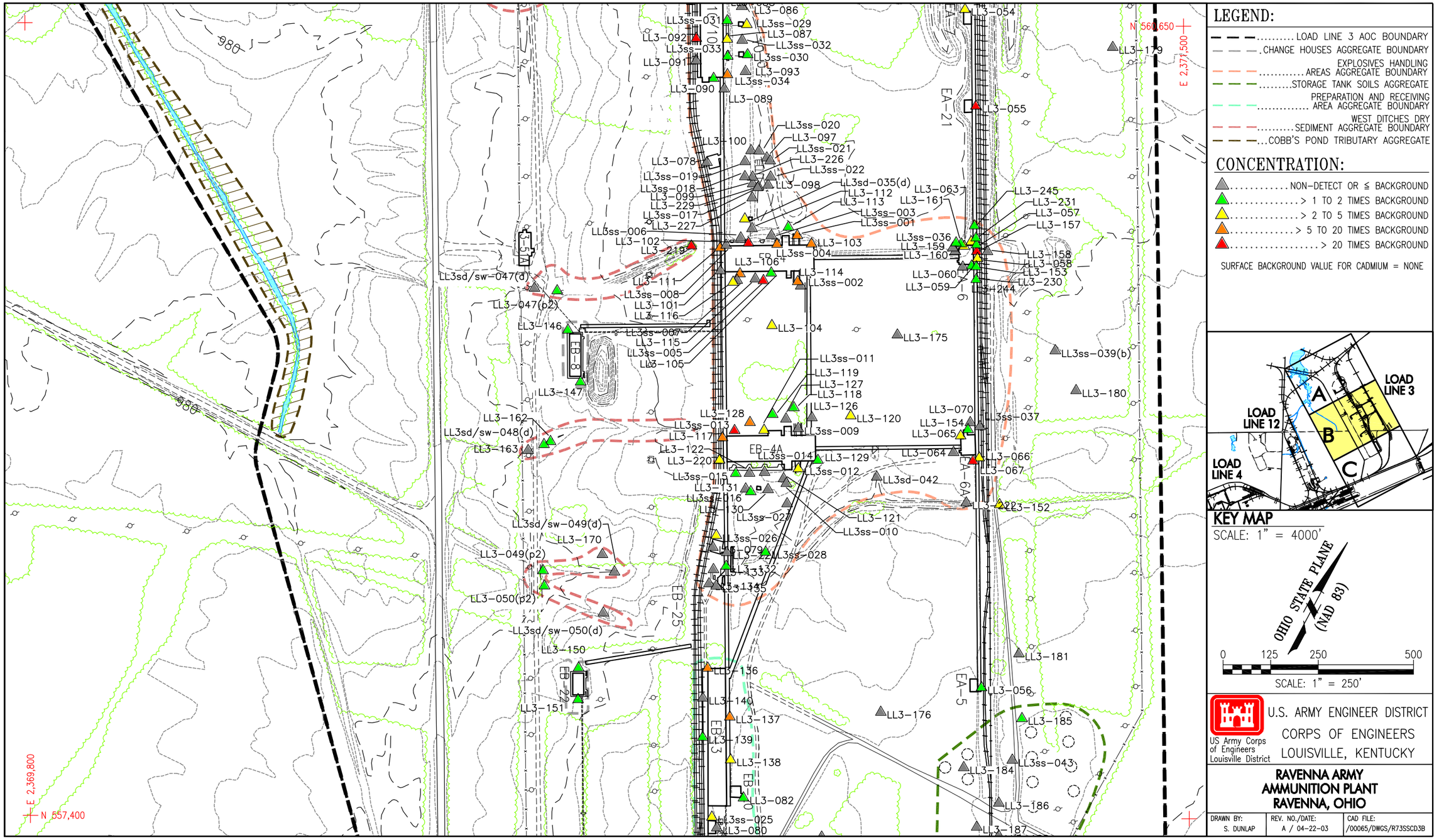


Figure 4-6. Distribution of Cadmium in Surface Soil at Load Line 3 - Central Section

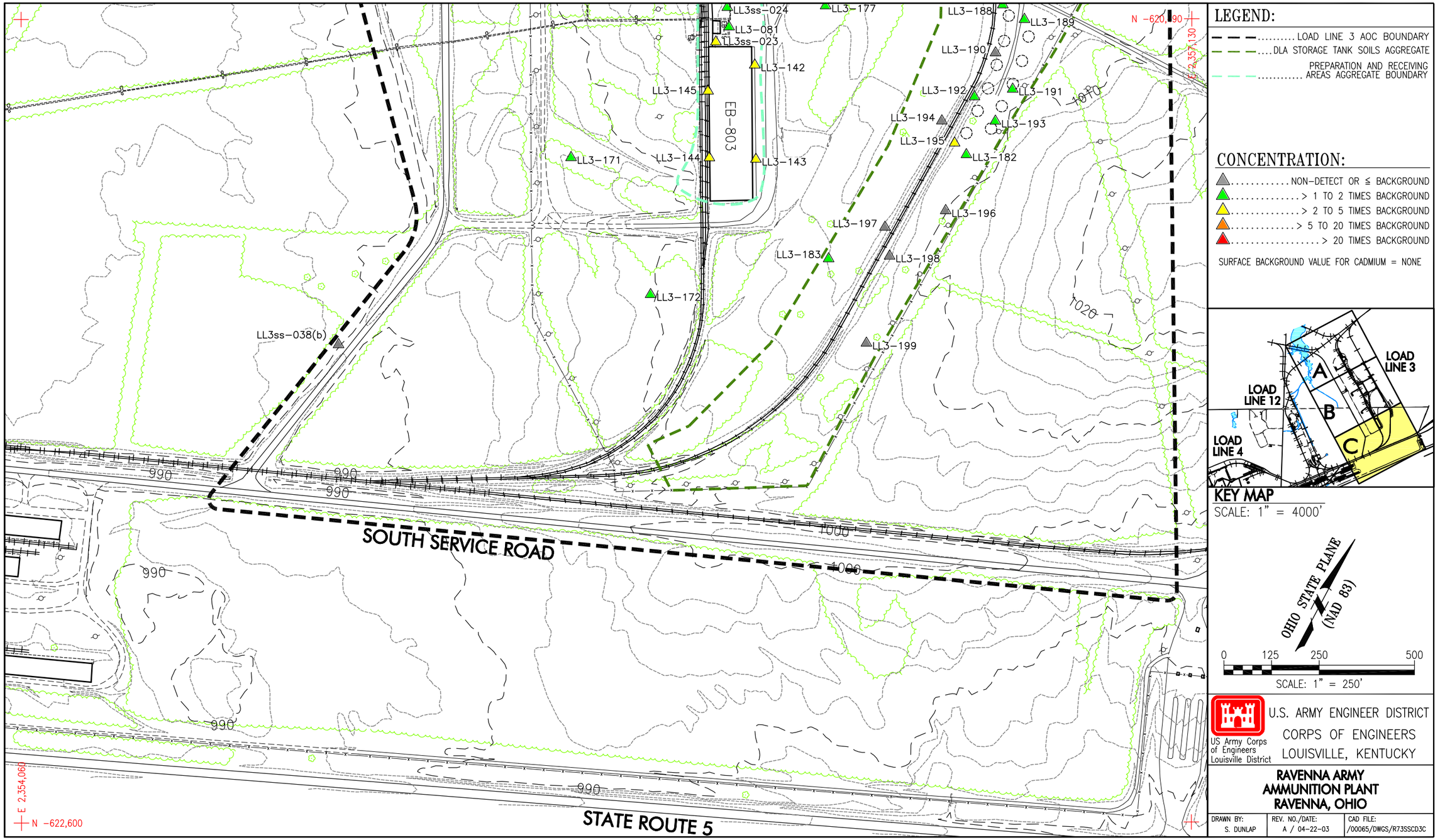


Figure 4-7. Distribution of Cadimium in Surface Soil at Load Line 3 - Southern Section

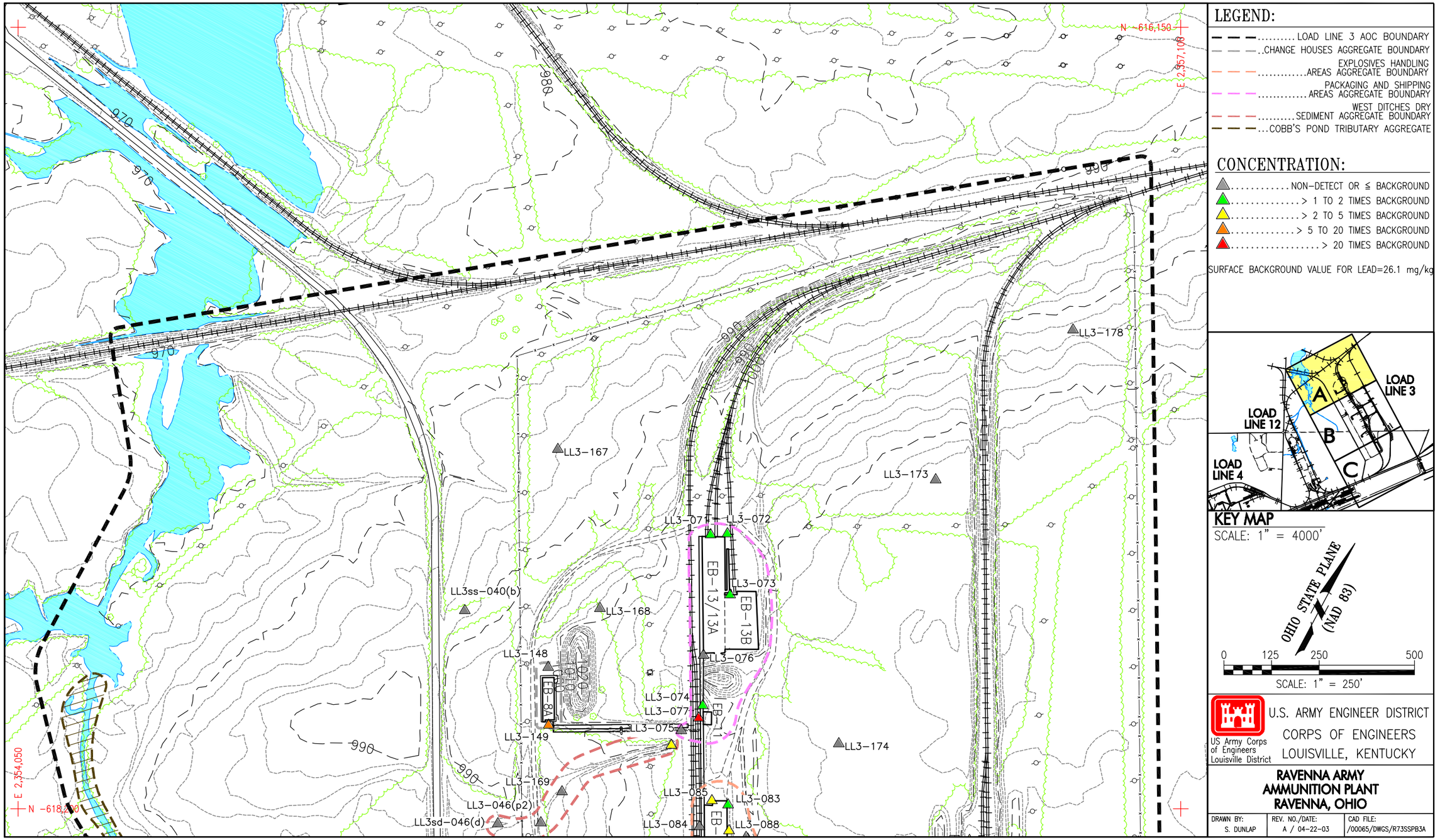


Figure 4-8. Distribution of Lead in Surface Soil at Load Line 3 - Northern Section

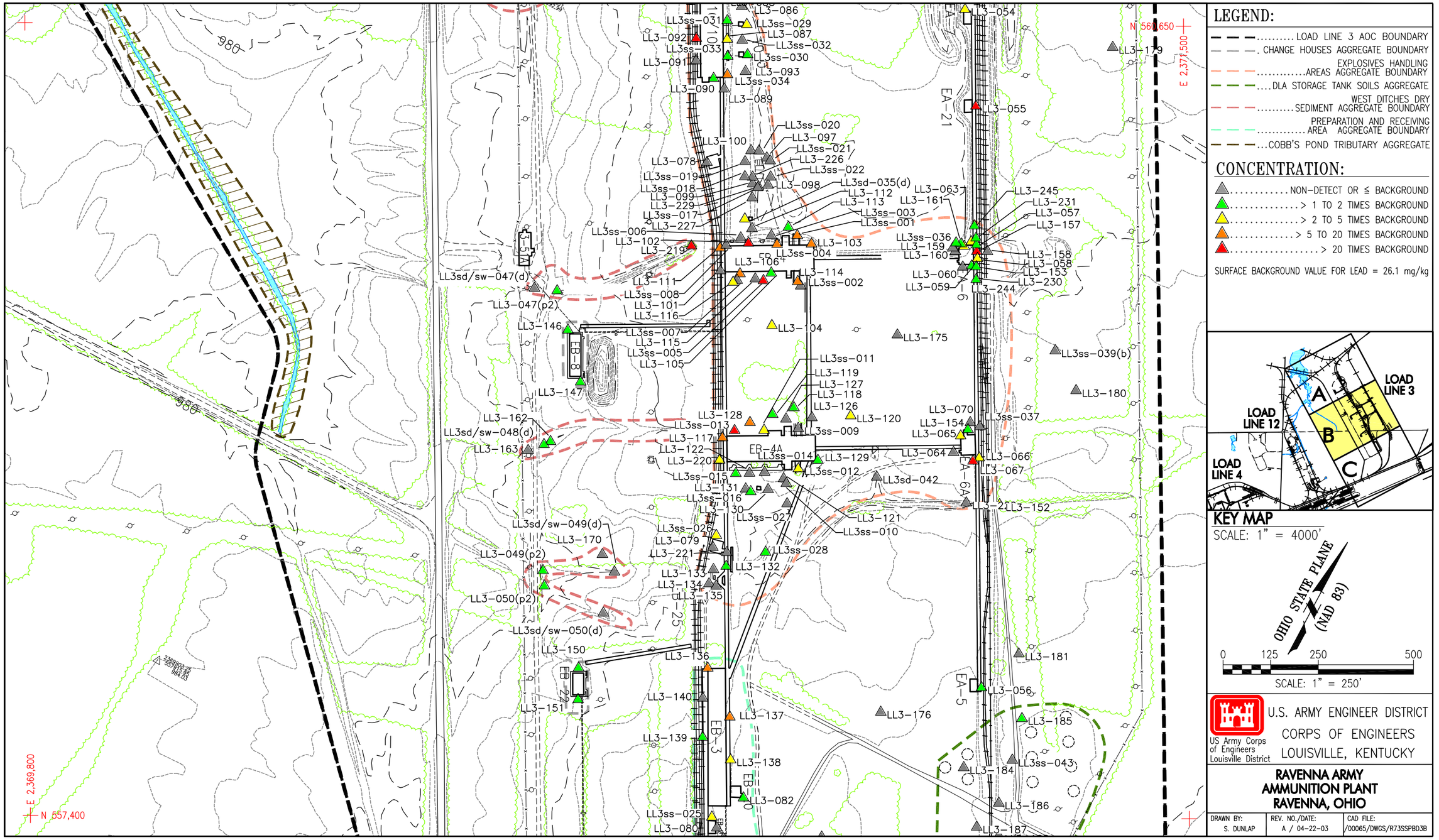


Figure 4-9. Distribution of Lead in Surface Soil at Load Line 3 - Central Section

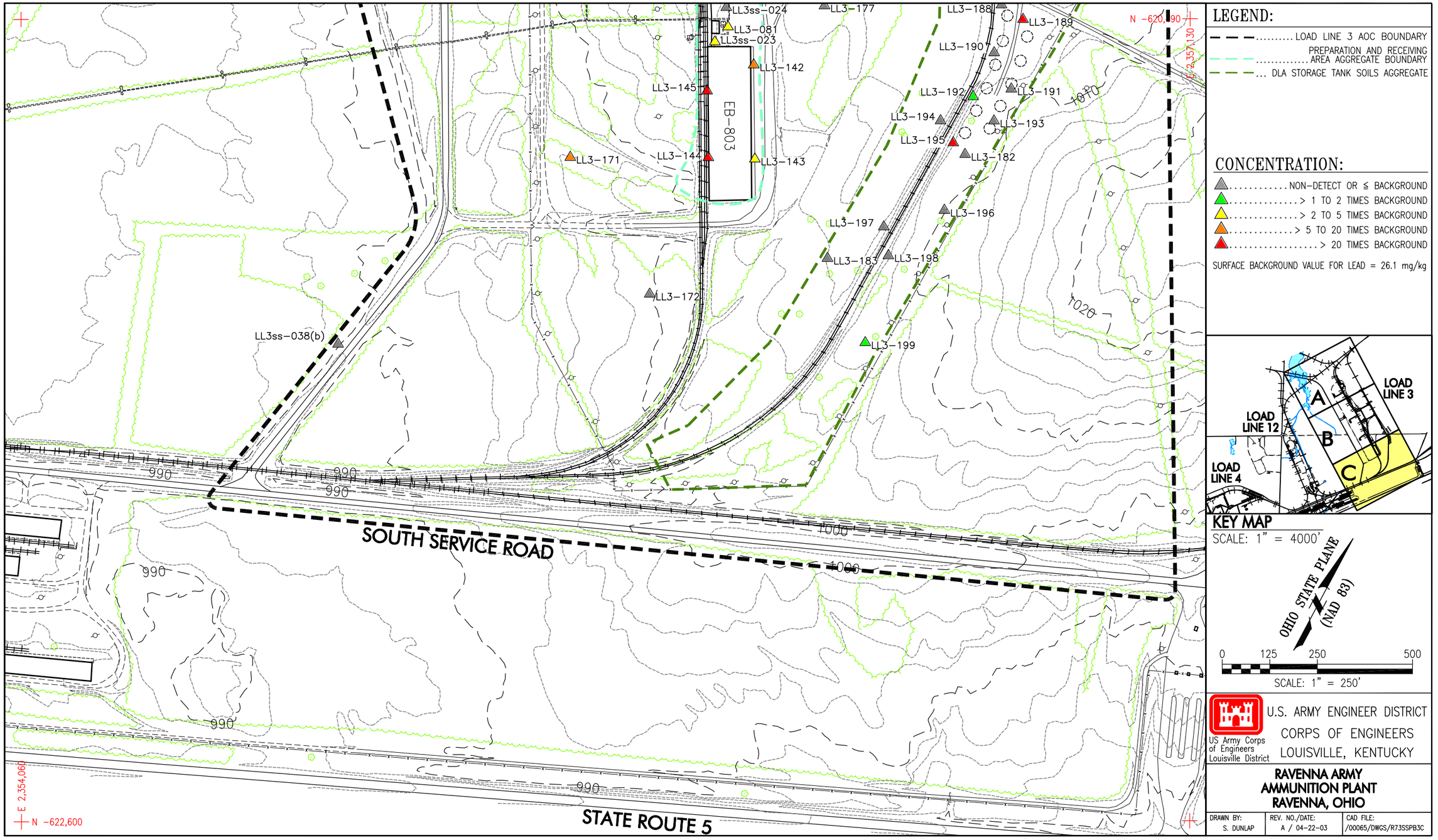


Figure 4-10. Distribution of Lead in Surface Soil at Load Line 3 - Southern Section

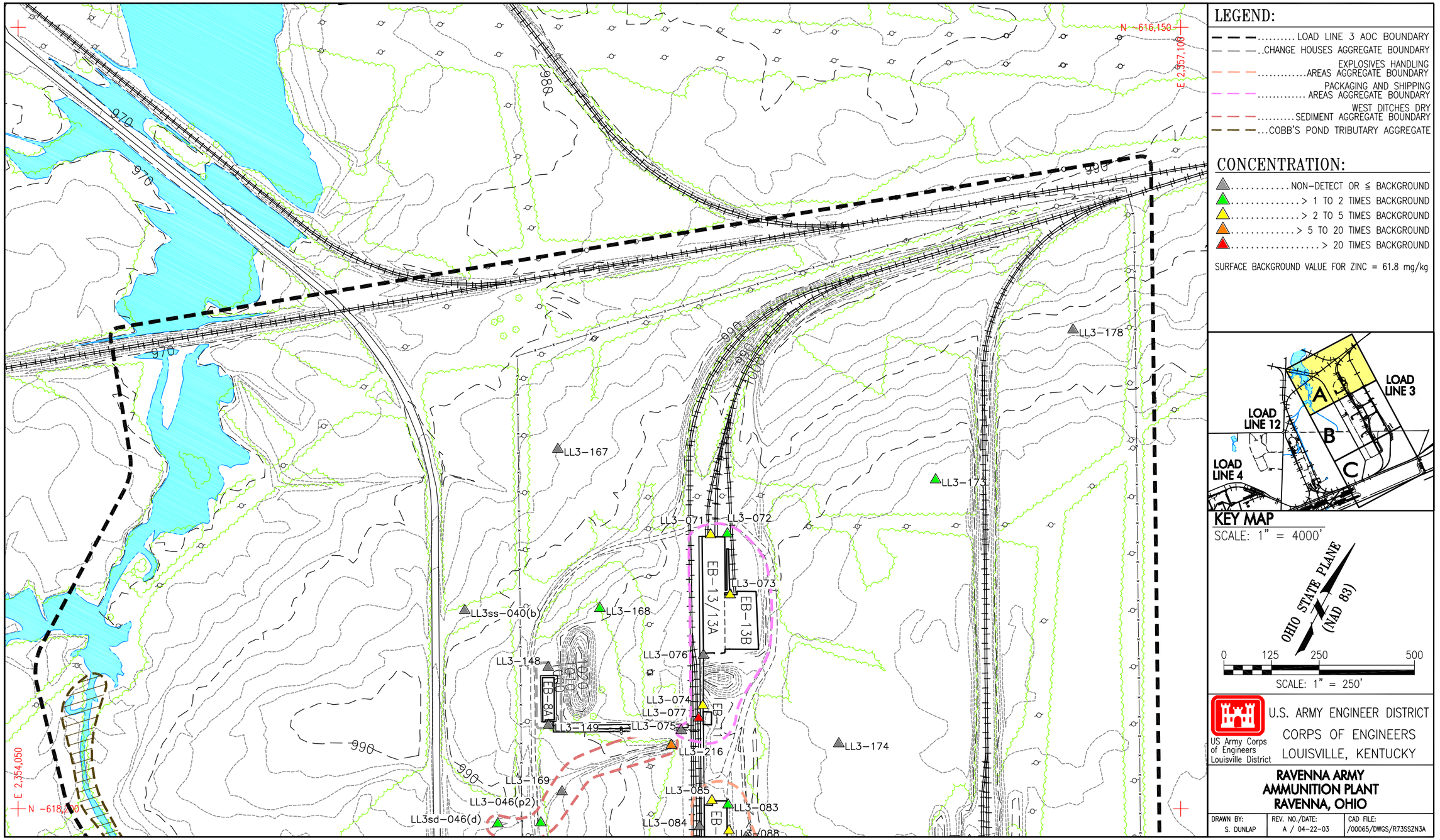


Figure 4-11. Distribution of Zinc in Surface Soil at Load Line 3 - Northern Section

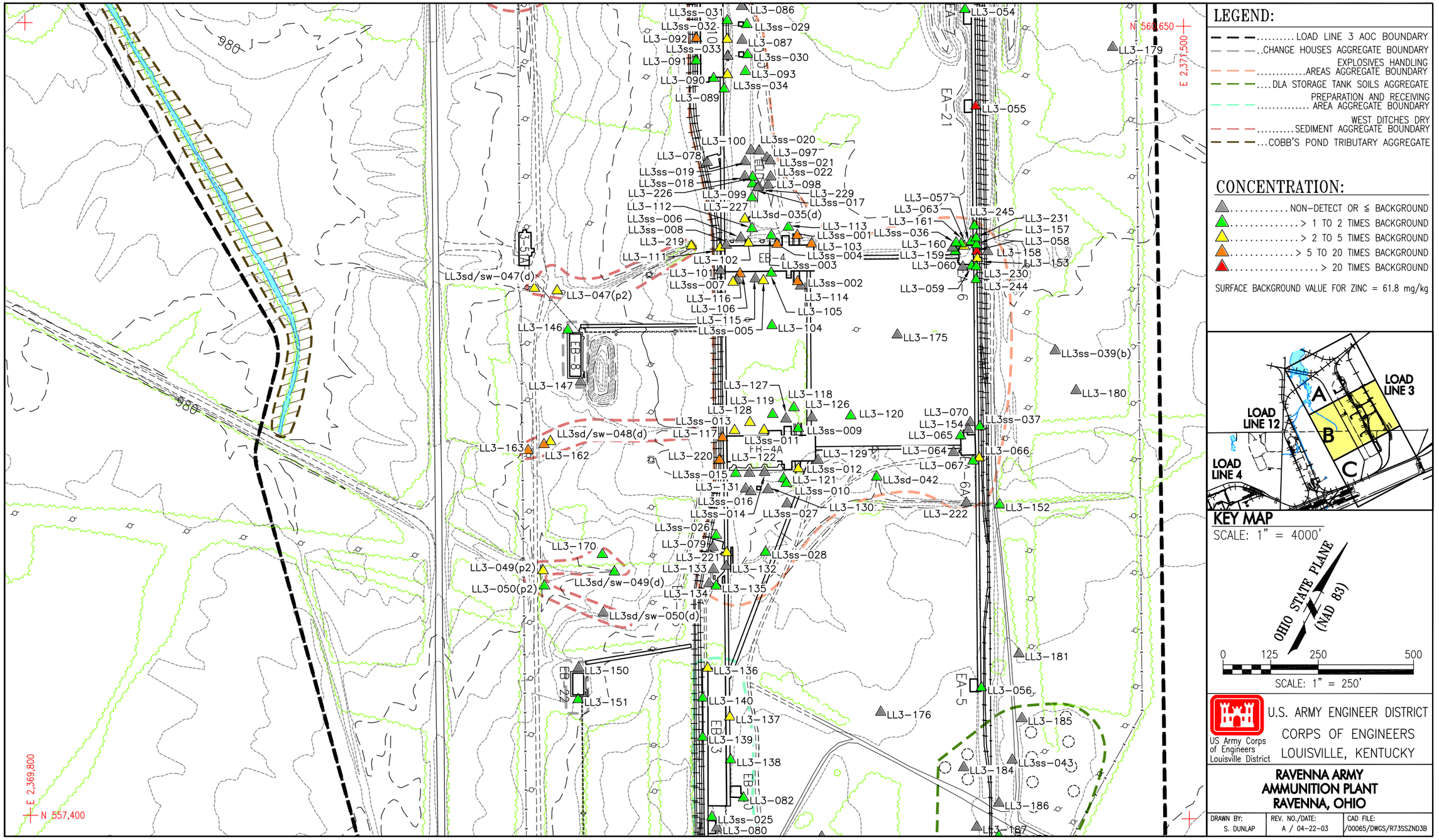


Figure 4-12. Distribution of Zinc in Surface Soil at Load Line 3 - Central Section

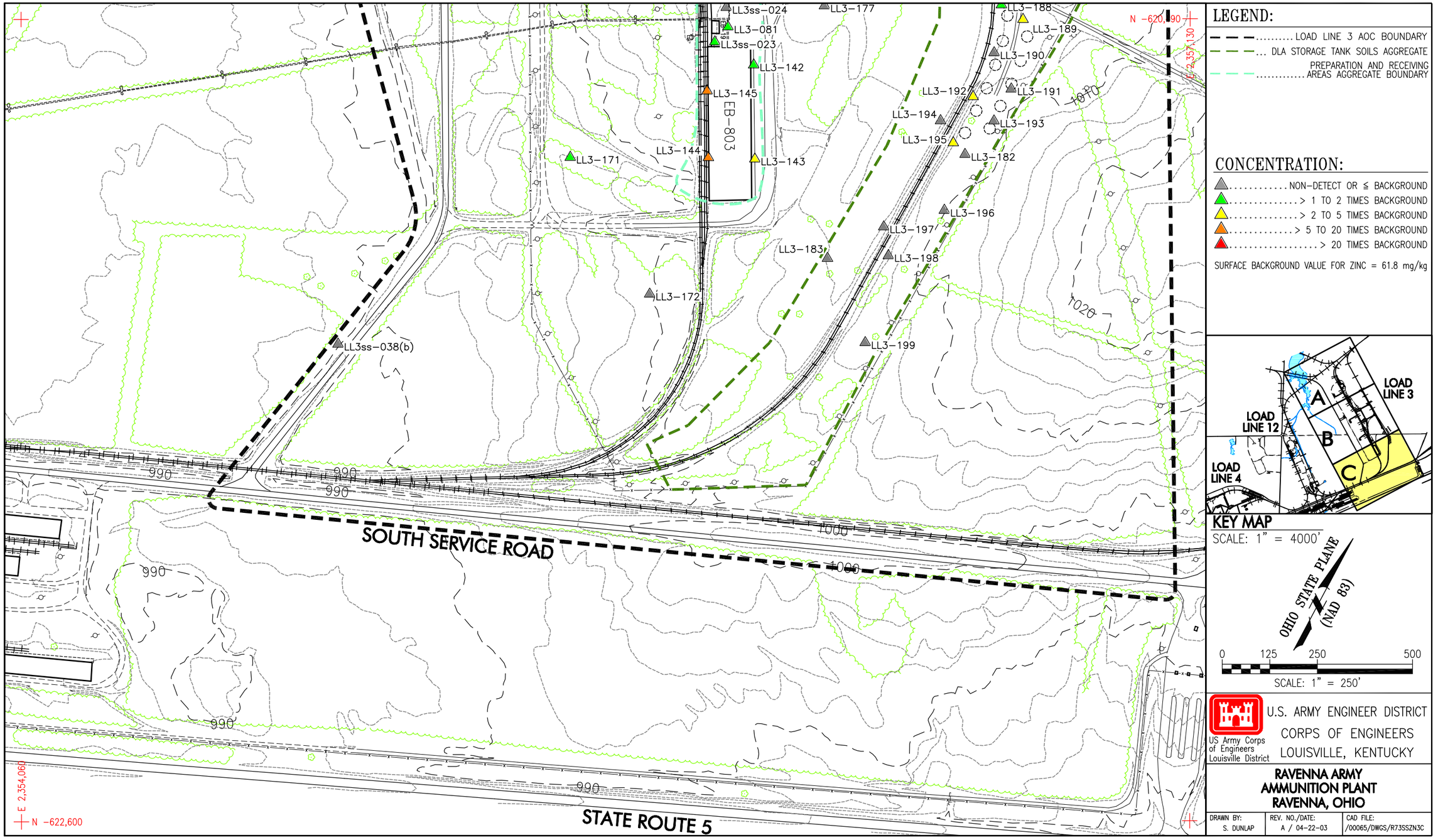


Figure 4-13. Distribution of Zinc in Surface Soil at Load Line 3 - Southern Section

Table 4-18. Summary Data for Site-Related Inorganics in Preparation and Receiving Area Aggregate Surface Soil at Load Line 3 [a]

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-080**	**LL3-081**	**LL3-082**	**LL3-082**
Sample ID		**LL30754**	**LL30757**	**LL30760**	**LL31126**
Date		**08/10/2001**	**08/09/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	NA	NA	NA	NA
Antimony	mg/kg	1.1 UJ	1.2 UJ	1.1 UJ	1.1 UJ
Arsenic	mg/kg	11.3 =	11.9 =	11.7 =	10 =
Barium	mg/kg	24.9 =	65.6 =	47.7 J	40.8 J
Beryllium	mg/kg	0.3 U	0.56 J	0.38 U	0.34 U
Cadmium	mg/kg	0.072 J *	0.15 J *	0.77 = *	0.38 = *
Chromium	mg/kg	7 J	14.9 =	12.1 J	10 J
Cobalt	mg/kg	5.3 =	8.9 =	7.2 =	6.1 =
Copper	mg/kg	20.4 = *	88.2 J *	20.3 J *	18 J *
Lead	mg/kg	15.1 J	66.5 J *	45.5 J *	32.8 J *
Manganese	mg/kg	236 =	435 =	369 J	324 J
Mercury	mg/kg	0.011 J	0.044 J *	0.058 J *	0.049 J *
Nickel	mg/kg	11.4 =	16.3 =	13.6 =	13 =
Silver	mg/kg	0.57 U	0.59 U	0.55 U	0.55 U
Thallium	mg/kg	0.18 J *	0.34 J *	0.22 J *	0.2 J *
Zinc	mg/kg	59.4 J	63.6 = *	81.9 = *	70.3 = *

Table 4-18. Summary Data for Site-Related Inorganics in Preparation and Receiving Area Aggregate Surface Soil at Load Line 3[a] (continued)

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-137**	**LL3-138**	**LL3-139**	**LL3-139**
Sample ID		**LL30905**	**LL30908**	**LL30911**	**LL31133**
Date		**08/10/2001**	**08/10/2001**	**08/11/2001**	**08/11/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	NA	NA	NA	NA
Antimony	mg/kg	1.1 UJ	1 J *	1.2 UJ	1.2 UJ
Arsenic	mg/kg	11.3 =	6.5 =	15.7 = *	14.2 =
Barium	mg/kg	132 = *	183 J *	86.3 =	77.1 =
Beryllium	mg/kg	0.53 J	2.6 = *	0.74 J	0.7 J
Cadmium	mg/kg	2.5 = *	2.8 = *	0.35 J *	0.15 U
Chromium	mg/kg	16.8 J	22.3 J *	18.7 = *	15.4 =
Cobalt	mg/kg	5.6 =	3.4 =	12.6 = *	11.1 = *
Copper	mg/kg	115 = *	18 J *	23.3 = *	20.5 = *
Lead	mg/kg	153 J *	119 J *	29.3 J *	13.5 J
Manganese	mg/kg	460 =	1,390 J	281 =	239 =
Mercury	mg/kg	0.053 J *	0.022 J	0.12 U	0.12 U
Nickel	mg/kg	20 =	11.2 =	27 = *	25.6 = *
Silver	mg/kg	0.6 U	0.57 U	0.59 U	0.58 U
Thallium	mg/kg	0.31 J *	0.64 J *	0.35 = *	0.35 = *
Zinc	mg/kg	224 J *	111 = *	84.3 J *	61 J

Table 4-18. Summary Data for Site-Related Inorganics in Preparation and Receiving Area Aggregate Surface Soil at Load Line 3[a] (continued)

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-142**	**LL3-142**	**LL3-143**	**LL3-144**
Sample ID		**LL30918**	**LL31120**	**LL30921**	**LL30924**
Date		**08/09/2001**	**08/09/2001**	**08/09/2001**	**08/09/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Field Duplicate**	**Grab**	**Grab**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	0.53 U	0.53 U	NA	0.68 = *
Antimony	mg/kg	17.9 J *	15.6 J *	8.4 J *	1.1 J *
Arsenic	mg/kg	5.2 =	5.1 =	5.9 =	14.5 =
Barium	mg/kg	123 = *	155 = *	91.3 = *	219 = *
Beryllium	mg/kg	0.47 J	0.4 J	0.46 J	1.6 = *
Cadmium	mg/kg	2.8 = *	2.3 = *	1.8 = *	6.8 = *
Chromium	mg/kg	18.1 = *	23.8 = *	9.8 =	28.3 = *
Cobalt	mg/kg	3 =	2.6 =	2.9 =	7.9 =
Copper	mg/kg	32.8 = *	28.2 = *	33.8 = *	169 = *
Lead	mg/kg	138 = *	172 = *	65.6 = *	634 = *
Manganese	mg/kg	513 =	500 =	645 =	1,610 = *
Mercury	mg/kg	0.15 = *	0.19 = *	0.041 J *	0.076 J *
Nickel	mg/kg	12.3 =	10.9 =	10.6 =	16.6 =
Silver	mg/kg	0.53 U	0.53 U	0.56 U	0.29 J *
Thallium	mg/kg	0.11 J *	0.21 J *	0.32 = *	0.26 J *
Zinc	mg/kg	120 = *	110 = *	152 = *	464 = *

Table 4-18. Summary Data for Site-Related Inorganics in Preparation and Receiving Area Aggregate Surface Soil at Load Line 3 [a] (continued)

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3ss-023**	**LL3ss-024**	**LL3ss-025**
Sample ID		**LL3SS-023-0187-SO**	**LL3SS-024-0188-SO**	**LL3SS-025-0189-SO**
Date		**07/23/1996**	**07/23/1996**	**07/23/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**			
Inorganics				
Cyanide	mg/kg	0.12 U	0.11 U	0.12 J *
Antimony	mg/kg	3.4 = *	0.33 =	5.4 = *
Arsenic	mg/kg	13.7 =	12 =	12.2 =
Barium	mg/kg	62.1 =	26.8 =	41.2 =
Beryllium	mg/kg	0.63 =	0.31 =	0.5 =
Cadmium	mg/kg	1.5 = *	0.14 J *	1.5 = *
Chromium	mg/kg	15.3 =	7 =	14.4 =
Cobalt	mg/kg	6.7 =	5.8 =	5.7 =
Copper	mg/kg	32.2 = *	18.5 = *	43.1 = *
Lead	mg/kg	61.7 = *	13.9 =	64.1 = *
Manganese	mg/kg	289 =	276 =	214 =
Mercury	mg/kg	0.04 U	0.04 U	0.04 U
Nickel	mg/kg	18 =	10.7 =	13.6 =
Silver	mg/kg	0.22 U	0.21 U	0.2 =
Thallium	mg/kg	1.1 = *	1 = *	0.78 = *
Zinc	mg/kg	104 = *	52.9 =	109 = *

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
ID = Identification.
NA = Not analyzed.
* - Exceeds Ravenna Army Ammunition Plant background criteria.
= - Detected result.
J - Estimated result.
U - Not detected.

Antimony was detected above background criterion in 7 samples collected from 15 locations surrounding Buildings EB-3, EB-2, and EB-803 (Figure 4-7). The highest concentration (17.9 mg/kg) (Table 4-18) was identified in sample LL3-142, which is located on the east side of Building EB-803. The majority of concentrations were identified in samples collected near Buildings EB-803 and EB-2 (Figures 4-6 and 4-7).

Cadmium was also identified in all samples collected with reported values ranging between 0.14 (LL3-140 and LL3ss-024) and 6.8 mg/kg (LL3-144) (Table 4-15). The distribution and concentrations of cadmium are presented in Figures 4-5, 4-6, and 4-7. Sample station LL3-144 is located along the western side of Building EB-803.

Copper was identified in 15 of 15 samples with 14 of those detects being above the established background concentration. This highest detected concentration (334 mg/kg) was reported in the sample collected from station LL3-145, which is located along the west side of Building EB-803.

Lead was identified in 15 of 15 surface samples with reported values ranging between 13.9 (LL33ss-024) (Phase I Sampling Location) and 634 mg/kg (LL3-144). The distribution of lead in the Load Line 3 surface soils is illustrated on Figures 4-8, 4-9, and 4-10.

Thallium was detected in 14 of 15 surface soil samples with all detected concentrations exceeding the established background criteria. All reported values for thallium were less than 1.1 mg/kg.

Zinc was detected in 15 of 15 samples with concentrations ranging from 52.9 mg/kg (LL3-ss-024) (Phase I RI sampling location) to 464 mg/kg (LL3-144). Sample station LL3-144 is located along the western side of Building EB-803. The distribution of zinc in the Load Line 3 surface soils is presented on Figures 4-11, 4-12, and 4-13.

The highest reported values for nine inorganic parameters were reported in the sample collected from Station LL3-144, which is located on the southwestern border of Building EB-803. Other stations reporting the highest values for inorganic parameters were LL3-142 and LL3-145, located on the northeast and southeast sides of Building EB-803, respectively.

4.2.4.2 Change Houses Aggregate

Six samples were collected from the surface soil associated with the Change Houses Aggregate and analyzed to determine the presence of TAL metals. As presented in Table 4-3, a total of 17 metals were detected at least once in surface soil samples collected. Of these, three compounds (arsenic, selenium, and vanadium) were eliminated as SRCs as all concentrations were detected below the established background concentrations.

For those metals retained as SRCs in surface soil, 12 were detected in 6 of 6 surface samples collected (Table 4-3). Cadmium, lead, manganese, and thallium were detected most frequently above their respective background concentrations. Aluminum, chromium, cobalt, nickel and silver were detected at the lowest frequencies above their respective background concentrations with only one sample each exceeding the background criteria. Table 4-19 provides a summary of all metals detected in the surface soil associated with the Change Houses Aggregate.

Cadmium was identified in six of six samples collected with all detected concentrations exceeding the established background concentration. The highest detected concentration (1 mg/kg) was identified at Station LL3-149 (Figure 4-7), located on the south end of EB-8A. Lead was identified above background in five of six locations with the highest concentration being 177 mg/kg (LL3-149).

Table 4-19. Summary Data for Site-Related Inorganics in Change Houses Aggregate Surface Soil at Load Line 3

Functional Area		Change Houses Aggregate	Change Houses Aggregate	Change Houses Aggregate	Change Houses Aggregate	Change Houses Aggregate	Change Houses Aggregate
Station ID		**LL3-146**	**LL3-147**	**LL3-148**	**LL3-149**	**LL3-150**	**LL3-151**
Sample ID		**LL30930**	**LL30933**	**LL30936**	**LL30939**	**LL30942**	**LL30945**
Date		**08/08/2001**	**08/08/2001**	**08/09/2001**	**08/09/2001**	**08/08/2001**	**08/08/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**						
Inorganics							
Aluminum	mg/kg	10,400 =	13,000 =	13,400 =	18,900 = *	11,800 =	10,400 =
Barium	mg/kg	65.7 =	140 = *	57.4 J	205 J *	146 = *	83.5 =
Beryllium	mg/kg	0.71 =	1.9 = *	0.57 =	2.9 = *	1.6 = *	0.52 J
Cadmium	mg/kg	0.38 J *	0.41 J *	0.21 = *	1 = *	0.36 J *	0.43 J *
Chromium	mg/kg	15.9 =	14.2 =	18.9 J *	12.4 J	14.9 =	13 =
Cobalt	mg/kg	11.4 = *	2.2 =	10 =	4.7 =	2.9 =	8.1 =
Copper	mg/kg	21.8 J *	7 J	17.2 J	14.1 J	6.4 J	15.2 J
Lead	mg/kg	26.7 J *	51.2 J *	18.4 J	177 J *	28.9 J *	45.4 J *
Manganese	mg/kg	503 =	1,510 = *	504 J	2,040 J *	2,440 = *	662 =
Mercury	mg/kg	0.012 J	0.018 J	0.035 J	0.065 J *	0.013 J	0.074 J *
Nickel	mg/kg	23.3 = *	5.9 =	17.7 =	11.3 =	6.1 =	13.2 =
Silver	mg/kg	0.58 U	0.56 U	0.59 U	8.7 = *	0.55 U	0.57 U
Thallium	mg/kg	0.3 J *	0.21 J *	0.34 J *	0.19 J *	0.24 J *	0.33 J *
Zinc	mg/kg	77.5 = *	45.7 =	57.8 =	59.3 =	54.4 =	94.9 = *

ID = Identification.
* - Exceeds Ravenna Army Ammunition Plant background criteria.
= - Detected result.
J - Estimated result.
U - Not detected.

Sampling station LL3-149, located on the south end of EB-8A (Figure 4-7), contained nine metals at concentrations exceeding their respective background concentrations (Table 4-16). Six of the metals detected exhibited the highest concentrations reported in the Change Houses Aggregate surface soil (Table 4-16).

4.2.4.3 Explosives Handling Areas Aggregate

As presented in Table 4-3, a total of 19 metals plus cyanide were detected at least once in surface soil samples collected from the Change Houses Aggregate. Of these, one metal, vanadium, was eliminated as an SRC as all concentrations were detected below the established background concentration.

For those metals retained as SRCs in surface soil (Table 4-3), eight were detected in all samples analyzed for that specific parameter. The most pervasive constituents were cadmium, copper, lead, thallium and zinc, with each being detected at the highest frequency above background. Table 4-17 provides a summary of all metals detected in the surface soil samples associated with the Explosives Handling Areas Aggregate.

Arsenic was detected in 107 of 108 samples collected from the Explosives Handling Areas Aggregate (Figure 4-1). Concentrations ranged between 4.5 (LL3-111) and 34 mg/kg (LL3-102) (Table 4-20). LL3-102 is located to the north of Building EB-4 (Figure 4-12), also where sample stations LL3-099 and LL3-027 were identified as having arsenic concentrations at 31.4 and 30.2 mg/kg, respectively.

Antimony was detected in 13 of 78 samples collected (Table 4-3). Concentrations ranged between 0.51 (LL3-067) and 164 mg/kg (LL3-102). With the exception of LL3-102, all remaining antimony concentrations were less than 4.7 mg/kg and widespread across the aggregate.

Barium was identified in 108 of 108 samples collected (Table 4-3). Concentrations ranged between 16.1 (LL3ss-014) (Phase I sample location) and 1,130 mg/kg (LL3-103). Surface sample station LL3-103 is located on the northeast corner of Building EB-4. A barium concentration of 1,190 mg/kg was detected from sample station LL3-058, which is located on the west side of Building EA-6. The remaining concentrations were identified at concentration less than 500 mg/kg and widespread across the aggregate.

Cadmium and zinc were both identified at station LL3-158 at their highest detected concentrations of 28.7 and 2,830 mg/kg, respectively. Station LL3-158 is located on the south side of Building EA-6.

Manganese was identified in 108 of 108 samples collected (Table 4-3). The minimum and MDCs were identified in Phase I sample stations LL3ss-019 (75.3 mg/kg) and LL3ss-026 (4,800 mg/kg), respectively. LL3ss-026 is located near the railroad tracks to the south of Building EB-4A (Figure 4-12). Generally, those manganese concentrations exceeding 1,000 mg/kg (Table 4-20) were found to be associated with Buildings EB-4 and EB-6 and areas further north.

Zinc was identified in 107 of 108 samples collected (Table 4-3). Concentrations ranged between 21.3 (LL3-097) and 2,830 mg/kg (LL3-058). Sample station LL3-058 is located on the east side of Building EB-6 (Figures 4-11, 4-12, and 4-13). Other areas with high zinc concentrations are associated with Buildings EB-4A and EB-4 and areas to the north.

Sample stations LL3-058 and LL3-102, located near Building EA-6 and EB-4 respectively, contained the highest concentrations of several metals detected (Table 4-20). Otherwise, the metals detected were generally found to be widespread across the Explosives Handling Areas Aggregate.

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a]

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-057**	**LL3-057**	**LL3-058**	**LL3-059**	**LL3-060**
Sample ID		**LL30693**	**LL31121**	**LL30696**	**LL30699**	**LL30702**
Date		**07/31/2001**	**07/31/2001**	**07/31/2001**	**07/31/2001**	**07/31/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Field Duplicate**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	0.55 U	0.55 U	NA	NA	NA
Aluminum	mg/kg	6,820 =	7,700 =	23,400 = *	7,940 =	7,140 =
Antimony	mg/kg	1.1 UJ	1.1 UJ	4 J *	1.1 UJ	1.1 UJ
Arsenic	mg/kg	13.8 J	14.5 J	8.8 J	9.8 J	10.8 J
Barium	mg/kg	60.5 =	50.9 =	1,190 = *	47.8 =	62.1 =
Beryllium	mg/kg	0.5 J	0.67 =	3.3 = *	0.33 J	0.42 J
Cadmium	mg/kg	0.4 J *	0.41 J *	28.7 = *	0.4 J *	0.95 = *
Chromium	mg/kg	12.6 =	13.8 =	175 = *	11.4 =	13 =
Cobalt	mg/kg	9.9 =	12.6 = *	17.7 = *	5.9 =	7.9 =
Copper	mg/kg	16.9 =	19.3 = *	98.5 = *	20.5 = *	14.8 =
Lead	mg/kg	68.6 J *	52 J *	1,590 J *	46.4 J *	25.7 J
Manganese	mg/kg	592 =	495 =	2,300 = *	310 =	1,020 =
Mercury	mg/kg	0.011 J	0.011 J	0.15 = *	0.027 J	0.028 J
Nickel	mg/kg	21.8 = *	26.2 = *	24.8 = *	15.2 =	16.8 =
Selenium	mg/kg	2.2 U	2.2 U	2.6 = *	0.35 J	0.49 J
Silver	mg/kg	0.55 U	0.55 U	0.29 J *	0.53 U	0.55 U
Thallium	mg/kg	0.36 U	0.39 U	0.16 J *	0.35 U	0.37 U
Zinc	mg/kg	116 = *	84.6 = *	2,830 = *	75.6 = *	56.4 =

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-063**	**LL3-064**	**LL3-065**	**LL3-065**	**LL3-066**
Sample ID		**LL30707**	**LL30710**	**LL30713**	**LL31129**	**LL30716**
Date		**07/31/2001**	**07/31/2001**	**08/07/2001**	**08/07/2001**	**08/08/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	0.57 U	NA	NA	NA
Aluminum	mg/kg	6,660 =	10,300 =	8,000 =	8,660 =	8,250 =
Antimony	mg/kg	1.1 UJ	1.1 UJ	1.2 UJ	1.2 UJ	0.6 J
Arsenic	mg/kg	10.6 J	12 J	15.9 J *	12.3 J	13.4 =
Barium	mg/kg	134 = *	57.5 =	64.3 J	54.4 J	99.2 = *
Beryllium	mg/kg	0.36 J	0.49 J	0.54 =	0.51 =	0.73 =
Cadmium	mg/kg	2.5 = *	0.36 J *	0.86 = *	0.8 = *	1.3 = *
Chromium	mg/kg	16.2 =	14.2 =	16 =	16.7 =	20.7 = *
Cobalt	mg/kg	6.6 =	8.6 =	10.3 J	8.7 J	9.6 =
Copper	mg/kg	22.8 = *	13.4 =	16.8 =	16.8 =	31.1 = *
Lead	mg/kg	103 J *	23.5 J	61.9 J *	79.8 J *	103 J *
Manganese	mg/kg	441 =	505 =	774 J	470 J	890 J
Mercury	mg/kg	0.028 J	0.037 J *	0.011 J	0.03 J	0.11 U
Nickel	mg/kg	15.9 =	16.5 =	20.4 J	17.4 J	24.1 J *
Selenium	mg/kg	0.42 J	2.3 U	0.37 J	0.5 J	0.68 =
Silver	mg/kg	0.55 U	0.57 U	0.58 J	0.59 U	0.57 U
Thallium	mg/kg	0.37 U	0.42 U	0.36 = *	0.32 U	0.36 = *
Zinc	mg/kg	159 = *	60.5 =	116 = *	152 = *	135 J *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-067**	**LL3-070**	**LL3-078**	**LL3-079**	**LL3-083**
Sample ID		**LL30719**	**LL30724**	**LL30748**	**LL30751**	**LL30763**
Date		**07/31/2001**	**08/08/2001**	**08/11/2001**	**08/10/2001**	**08/06/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	2,520 =	7,210 =	8,360 J	9,890 J	8,320 J
Antimony	mg/kg	0.51 J	1.1 UJ	1.1 UJ	1.1 UJ	1.2 UJ
Arsenic	mg/kg	5.3 J	15.8 = *	9.5 =	13.3 =	12.5 J
Barium	mg/kg	124 = *	34.2 =	53.7 =	64.2 =	65.5 J
Beryllium	mg/kg	0.19 U	0.64 =	0.67 =	0.64 =	0.68 =
Cadmium	mg/kg	5.7 = *	0.42 = *	0.2 J *	0.2 J *	0.55 = *
Chromium	mg/kg	19.8 = *	16.6 =	8.4 J	12.9 J	14.8 J
Cobalt	mg/kg	3.1 =	12 = *	6.2 J	8.6 J	11.7 J *
Copper	mg/kg	12.6 =	21.5 = *	16.4 J	14.5 J	22.4 J *
Lead	mg/kg	758 J *	15.9 J	19.8 =	16.3 =	34.3 J *
Manganese	mg/kg	210 =	580 J	550 =	457 =	744 J
Mercury	mg/kg	0.016 J	0.02 J	0.024 J	0.086 J *	0.048 J *
Nickel	mg/kg	13.3 =	27.8 J *	14.6 =	17.8 =	22.2 J *
Selenium	mg/kg	2.1 U	0.55 J	2.2 U	2.1 U	0.45 J
Silver	mg/kg	0.52 U	0.57 U	0.56 U	0.53 U	0.47 J *
Thallium	mg/kg	0.28 U	0.29 = *	0.25 UJ	0.37 UJ	0.33 U
Zinc	mg/kg	94.3 = *	50.9 J	54.3 =	54.1 =	105 J *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-084**	**LL3-085**	**LL3-086**	**LL3-087**	**LL3-087**
Sample ID		**LL30766**	**LL30769**	**LL30772**	**LL30775**	**LL31135**
Date		**08/11/2001**	**08/06/2001**	**08/06/2001**	**08/06/2001**	**08/06/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Field Duplicate**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	0.57 U	NA	NA
Aluminum	mg/kg	5,110 J	9,050 J	11,000 J	9,580 J	11,800 J
Antimony	mg/kg	1.2 UJ	1.3 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Arsenic	mg/kg	12.4 =	12.6 J	11 J	11.5 J	11.5 J
Barium	mg/kg	35.6 =	98.7 J *	201 J *	64.3 J	71.3 J
Beryllium	mg/kg	0.53 J	1.1 = *	1.1 = *	0.67 =	0.92 = *
Cadmium	mg/kg	0.12 J *	2.4 = *	0.23 = *	0.2 = *	0.24 = *
Chromium	mg/kg	11.2 J	17.7 J *	12.2 J	13.7 J	12.4 J
Cobalt	mg/kg	7.2 J	7.2 J	10.7 J *	8.7 J	8.9 J
Copper	mg/kg	13.1 J	26 J *	12.9 J	12.1 J	12.6 J
Lead	mg/kg	10.8 =	107 J *	18.8 J	24.3 J	23.7 J
Manganese	mg/kg	330 =	819 J	1,810 J *	846 J	654 J
Mercury	mg/kg	0.015 J	0.076 J *	0.044 J *	0.043 J *	0.04 J *
Nickel	mg/kg	21.2 = *	19.2 J	13.2 J	16.8 J	16.1 J
Selenium	mg/kg	2.4 U	1.3 =	0.43 J	2.3 U	0.36 J
Silver	mg/kg	0.32 J *	4.5 = *	0.57 U	0.57 U	0.57 U
Thallium	mg/kg	0.21 U	0.31 UJ	0.37 = *	0.36 = *	0.29 U
Zinc	mg/kg	40.8 =	157 J *	46.5 J	56.2 J	52.3 J

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-088**	**LL3-089**	**LL3-090**	**LL3-090**	**LL3-091**
Sample ID		**LL30778**	**LL30781**	**LL30784**	**LL31127**	**LL30787**
Date		**08/06/2001**	**08/06/2001**	**08/01/2001**	**08/01/2001**	**08/11/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	13,800 J	9,740 J	7,470 =	7,360 =	6,920 J
Antimony	mg/kg	1.2 UJ	1.2 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Arsenic	mg/kg	11.4 J	13.6 J	13.1 J	11.2 J	19.4 = *
Barium	mg/kg	166 J *	62.6 J	53.2 =	52.9 =	39.6 =
Beryllium	mg/kg	1.6 = *	0.65 =	0.58 =	0.55 =	0.82 =
Cadmium	mg/kg	0.95 = *	0.24 = *	0.37 J *	0.42 J *	0.17 J *
Chromium	mg/kg	17 J	15.1 J	13.1 =	14.8 =	14.5 J
Cobalt	mg/kg	7.4 J	10.9 J *	8.5 =	8.4 =	13.4 J *
Copper	mg/kg	25.8 J *	19.5 J *	16.2 =	16.3 =	20.9 J *
Lead	mg/kg	89.9 J *	21.6 J	36 J *	42.7 J *	15.8 =
Manganese	mg/kg	1,160 J	620 J	451 =	472 =	514 =
Mercury	mg/kg	0.055 J *	0.024 J	0.018 J	0.04 J *	0.018 J
Nickel	mg/kg	16.4 J	19 J	21 =	21.5 = *	31.8 = *
Selenium	mg/kg	0.41 J	2.4 U	0.36 J	2.2 U	2.3 U
Silver	mg/kg	0.93 = *	0.59 U	0.55 U	0.55 U	0.57 U
Thallium	mg/kg	0.27 U	0.36 = *	0.4 U	0.43 U	0.31 UJ
Zinc	mg/kg	201 J *	64.9 J *	74.9 = *	79.2 = *	63.4 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-092**	**LL3-093**	**LL3-097**	**LL3-097**	**LL3-098**
Sample ID		**LL30790**	**LL30793**	**LL30799**	**LL31119**	**LL30802**
Date		**08/07/2001**	**08/06/2001**	**08/07/2001**	**08/07/2001**	**08/07/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	0.55 U	0.59 U	NA
Aluminum	mg/kg	12,200 =	10,700 J	10,800 =	14,700 =	9,580 =
Antimony	mg/kg	0.78 J	1.2 UJ	0.97 J *	0.75 J	1.2 UJ
Arsenic	mg/kg	13.6 =	11.7 J	8 =	7.3 =	12.3 =
Barium	mg/kg	224 = *	82.8 =	152 = *	170 = *	62.2 =
Beryllium	mg/kg	0.79 =	0.69 =	1.6 = *	2.2 = *	0.6 =
Cadmium	mg/kg	12.6 = *	0.29 = *	0.16 = *	0.15 = *	0.34 = *
Chromium	mg/kg	48.6 = *	13.4 J	9.7 =	9.8 =	14.8 =
Cobalt	mg/kg	13.2 = *	9.1 J	2.2 =	2.3 =	7.7 =
Copper	mg/kg	88.9 = *	12.4 J	4.6 =	4.6 =	9.5 =
Lead	mg/kg	599 J *	21.8 J	19.7 J	22.3 J	19.5 J
Manganese	mg/kg	894 =	883 J	2,060 = *	2,650 = *	590 =
Mercury	mg/kg	0.14 UJ	0.044 J *	0.028 UJ	0.024 UJ	0.041 UJ
Nickel	mg/kg	57.2 = *	14.7 J	3.1 =	2.7 =	10.4 =
Selenium	mg/kg	1.3 =	2.3 U	0.68 =	0.37 J	0.79 =
Silver	mg/kg	0.95 = *	0.59 U	0.55 U	0.59 U	0.59 U
Thallium	mg/kg	0.53 = *	0.34 U	0.21 J *	0.22 J *	0.35 = *
Zinc	mg/kg	1070 = *	63.2 J *	22.4 =	21.3 =	48.1 =

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-099**	**LL3-100**	**LL3-101**	**LL3-102**	**LL3-103**
Sample ID		**LL30805**	**LL30808**	**LL30811**	**LL30814**	**LL30817**
Date		**08/07/2001**	**08/07/2001**	**08/11/2001**	**08/07/2001**	**08/07/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	0.56 U	NA	NA
Aluminum	mg/kg	10,100 =	13,200 =	5500 J	4,180 =	6,950 =
Antimony	mg/kg	1.2 UJ	1.2 UJ	1.1 UJ	164 J *	0.93 J
Arsenic	mg/kg	31.4 = *	8.3 =	6.3 =	34 = *	15.5 = *
Barium	mg/kg	66.1 =	75.8 =	50.4 =	102 = *	1,330 = *
Beryllium	mg/kg	1.3 = *	0.47 =	0.62 =	0.43 J	0.49 =
Cadmium	mg/kg	0.33 = *	0.35 = *	0.32 J *	5.7 = *	8.2 = *
Chromium	mg/kg	29.2 = *	17.8 = *	11.1 J	320 = *	36.8 = *
Cobalt	mg/kg	22.1 = *	6.9 =	4.1 J	25.8 = *	11.4 = *
Copper	mg/kg	28.8 = *	13.4 =	11.7 J	243 = *	49.8 = *
Lead	mg/kg	16.6 J	20.4 J	19.4 =	1,350 J *	231 J *
Manganese	mg/kg	455 =	311 =	620 =	2,700 = *	1,030 =
Mercury	mg/kg	0.044 UJ	0.051 UJ	0.011 J	0.061 UJ	0.068 UJ
Nickel	mg/kg	40.5 = *	13.3 =	11.8 =	77.1 = *	22.9 = *
Selenium	mg/kg	0.55 J	0.42 J	2.2 U	11.8 U	0.61 =
Silver	mg/kg	0.6 U	0.62 U	0.56 U	0.27 J *	0.79 = *
Thallium	mg/kg	0.36 = *	0.37 = *	0.22 UJ	0.31 = *	0.36 = *
Zinc	mg/kg	66.2 = *	55.2 =	44.7 =	224 = *	687 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-104**	**LL3-105**	**LL3-106**	**LL3-111**	**LL3-112**
Sample ID		**LL30820**	**LL30823**	**LL30826**	**LL30833**	**LL30836**
Date		**08/08/2001**	**08/08/2001**	**08/08/2001**	**08/08/2001**	**08/07/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	8,360 =	6,220 =	8,250 =	23,100 = *	10,500 =
Antimony	mg/kg	1.2 UJ	1.2 UJ	1.6 UJ	2.8 J *	1.1 UJ
Arsenic	mg/kg	13.7 =	9.1 =	12.3 =	4.5 =	12.4 J
Barium	mg/kg	90.6 = *	43.1 =	395 = *	552 = *	39.6 J
Beryllium	mg/kg	0.68 =	0.38 J	0.54 J	3.3 = *	0.49 U
Cadmium	mg/kg	0.79 = *	0.43 J *	2.7 = *	4.2 = *	0.41 = *
Chromium	mg/kg	14.9 J	13.9 J	33.8 J *	27.1 = *	15.1 =
Cobalt	mg/kg	9.2 =	4.6 =	7.5 =	3 =	9.3 J
Copper	mg/kg	17.3 =	20.2 = *	42.9 = *	61.7 J *	17.6 =
Lead	mg/kg	62.7 = *	43.1 = *	405 = *	201 J *	22.8 J
Manganese	mg/kg	692 =	232 =	518 =	2,890 = *	264 J
Mercury	mg/kg	0.054 J *	0.024 J	0.045 J *	0.046 J *	0.053 J *
Nickel	mg/kg	20.1 =	12.4 =	24.2 = *	7.2 =	15.3 J
Selenium	mg/kg	0.63 J	2.3 U	2.4 U	0.45 J	0.82 =
Silver	mg/kg	0.61 U	0.58 U	0.6 U	0.55 U	0.57 U
Thallium	mg/kg	0.28 = *	0.22 J *	0.3 = *	0.28 J *	0.34 U
Zinc	mg/kg	113 = *	87.3 = *	386 = *	222 = *	81.9 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-112**	**LL3-113**	**LL3-114**	**LL3-115**	**LL3-116**
Sample ID		**LL31128**	**LL30839**	**LL30842**	**LL30845**	**LL30848**
Date		**08/07/2001**	**08/07/2001**	**08/08/2001**	**08/08/2001**	**08/08/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Field Duplicate**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	11,900 =	6,730 =	11,500 =	7,960 =	7,780 =
Antimony	mg/kg	1.2 UJ	1.2 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Arsenic	mg/kg	13.2 J	8.9 =	12.2 =	9 =	8.2 =
Barium	mg/kg	47.9 J	67.2 =	69.6 =	71.4 =	86.5 =
Beryllium	mg/kg	0.54 =	0.74 =	0.63 =	0.53 J	0.54 J
Cadmium	mg/kg	0.55 = *	0.5 = *	0.16 J *	0.11 J *	0.15 J *
Chromium	mg/kg	18.2 = *	10.5 =	17.3 J	17 J	18.7 = *
Cobalt	mg/kg	7.7 J	5 =	10.7 = *	10.5 = *	11.9 = *
Copper	mg/kg	19.9 = *	15.6 =	19.4 = *	15.1 =	15.5 J
Lead	mg/kg	38 J *	35 J *	13.8 =	13.3 =	15.7 J
Manganese	mg/kg	264 J	840 =	271 =	361 =	442 =
Mercury	mg/kg	0.055 J *	0.034 UJ	0.11 U	0.11 U	0.11 U
Nickel	mg/kg	15.9 J	10.5 =	25.6 = *	24.2 = *	27.2 = *
Selenium	mg/kg	0.7 =	0.5 J	2.3 U	2.2 U	2.3 U
Silver	mg/kg	0.59 U	0.58 U	0.57 U	0.55 U	0.56 U
Thallium	mg/kg	0.3 U	0.25 = *	0.31 = *	0.31 = *	0.33 J *
Zinc	mg/kg	97.9 = *	64.7 = *	58.4 =	47.4 =	46.7 =

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-117**	**LL3-118**	**LL3-119**	**LL3-120**	**LL3-121**
Sample ID		**LL30851**	**LL30854**	**LL30857**	**LL30860**	**LL30863**
Date		**08/06/2001**	**08/07/2001**	**08/07/2001**	**08/06/2001**	**08/06/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	0.59 U	NA	NA	NA	0.58 U
Aluminum	mg/kg	8,870 J	9,100 =	10,400 =	10,700 J	10,500 J
Antimony	mg/kg	2 J *	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ
Arsenic	mg/kg	13.3 J	12.6 J	13.2 J	12.4 J	13.3 J
Barium	mg/kg	375 J *	53.8 J	68.1 J	59.8 J	72.9 =
Beryllium	mg/kg	0.63 =	0.53 =	0.66 =	0.6 =	0.68 =
Cadmium	mg/kg	11.4 = *	0.62 = *	0.38 = *	0.93 = *	0.3 = *
Chromium	mg/kg	98.9 J *	14 =	17.9 = *	19 J *	14.8 J
Cobalt	mg/kg	29.1 J *	7.7 J	10.7 J *	9.6 J	10.2 J
Copper	mg/kg	297 J *	22.4 = *	22.2 = *	21.1 J *	18.2 J *
Lead	mg/kg	432 J *	30.4 J *	26.8 J *	72.7 J *	22.2 J
Manganese	mg/kg	1,160 J	328 J	314 J	558 J	562 J
Mercury	mg/kg	0.24 J *	0.04 J *	0.022 J	0.043 J *	0.033 J
Nickel	mg/kg	57 J *	17.3 J	25.7 J *	20.1 J	20.9 J
Selenium	mg/kg	4.7 U	0.36 J	0.43 J	0.38 J	2.3 U
Silver	mg/kg	0.5 J *	0.57 U	0.59 U	0.59 U	0.58 U
Thallium	mg/kg	0.36 = *	0.27 U	0.32 = *	0.32 U	0.36 = *
Zinc	mg/kg	825 J *	97.7 = *	76.7 = *	88 J *	65.1 J *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-122**	**LL3-126**	**LL3-127**	**LL3-127**	**LL3-128**
Sample ID		**LL30866**	**LL30872**	**LL30875**	**LL31123**	**LL30878**
Date		**08/01/2001**	**08/07/2001**	**08/07/2001**	**08/07/2001**	**08/07/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	7,080 =	5,880 =	8,490 =	9,040 =	7,310 =
Antimony	mg/kg	1.1 UJ	1.1 UJ	1.2 UJ	1.2 UJ	0.68 J
Arsenic	mg/kg	10.1 J	12.2 J	11.6 =	12 =	10.8 J
Barium	mg/kg	43.1 =	33.7 J	46.3 =	50.7 =	558 J *
Beryllium	mg/kg	0.39 J	0.47 =	0.5 =	0.52 =	0.5 =
Cadmium	mg/kg	0.3 J *	0.28 = *	0.33 = *	0.32 = *	0.98 = *
Chromium	mg/kg	9.9 =	12.3 =	14.5 =	16 =	43.1 = *
Cobalt	mg/kg	6.4 =	6.6 J	8.9 =	8.8 =	7.5 J
Copper	mg/kg	13.4 =	12.8 =	21.9 = *	22.3 = *	23.4 = *
Lead	mg/kg	19.8 J	23.5 J	17.3 J	17.7 J	188 J *
Manganese	mg/kg	342 =	367 J	402 J	414 J	524 J
Mercury	mg/kg	0.024 J	0.012 J	0.03 J	0.021 J	0.026 J
Nickel	mg/kg	14.4 =	16.5 J	20 J	21.1 J	16.7 J
Selenium	mg/kg	2.2 U	2.2 U	0.57 J	0.62 =	2.2 U
Silver	mg/kg	0.55 U	0.56 U	0.59 U	0.59 U	0.55 U
Thallium	mg/kg	0.41 U	0.31 = *	0.36 = *	0.38 = *	0.34 = *
Zinc	mg/kg	54.8 =	58.8 =	47.8 J	49.7 J	212 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-129**	**LL3-130**	**LL3-131**	**LL3-132**	**LL3-133**
Sample ID		**LL30881**	**LL30884**	**LL30887**	**LL30890**	**LL30893**
Date		**08/06/2001**	**08/06/2001**	**08/06/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	0.58 U	NA
Aluminum	mg/kg	8,190 J	6,160 J	10,300 J	9,570 =	6,590 J
Antimony	mg/kg	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
Arsenic	mg/kg	12.3 J	9.7 J	9.7 J	10.5 =	12.3 =
Barium	mg/kg	144 J *	41.9 J	59.9 J	54.3 =	36.5 =
Beryllium	mg/kg	0.98 = *	0.52 U	0.52 U	0.56 J	0.47 =
Cadmium	mg/kg	0.28 = *	0.93 = *	0.46 = *	0.25 J *	0.18 J *
Chromium	mg/kg	11 J	8.9 J	11.8 J	14.8 =	9.1 J
Cobalt	mg/kg	4.5 J	5.6 J	8.1 J	9 =	6.3 J
Copper	mg/kg	22.5 J *	13.4 J	11.8 J	19 = *	13.1 J
Lead	mg/kg	31.5 J *	22.4 J	18 J	26.6 = *	15.2 =
Manganese	mg/kg	828 J	376 J	796 J	287 =	367 =
Mercury	mg/kg	0.025 J	0.035 J	0.057 J *	0.013 J	0.021 J
Nickel	mg/kg	12 J	12.1 J	11.3 J	20.4 =	13.8 =
Selenium	mg/kg	0.4 J	2.3 U	0.56 J	2.3 U	2.2 U
Silver	mg/kg	0.55 U	0.59 U	0.59 U	0.58 U	0.54 U
Thallium	mg/kg	0.33 UJ	0.3 U	0.34 U	0.38 UJ	0.19 U
Zinc	mg/kg	61.6 J	56.7 J	52.3 J	60.3 =	49.2 =

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-134**	**LL3-135**	**LL3-153**	**LL3-153**	**LL3-154**
Sample ID		**LL30896**	**LL30899**	**LL30951**	**LL31134**	**LL30954**
Date		**08/10/2001**	**08/10/2001**	**08/13/2001**	**08/13/2001**	**08/13/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	1.1 J	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	4,250 J	6,830 J	5,010 =	6,000 =	9,700 =
Antimony	mg/kg	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Arsenic	mg/kg	6.9 =	10.9 =	9.9 =	11.7 =	12 =
Barium	mg/kg	26.7 =	44.8 =	103 = *	128 = *	58.7 =
Beryllium	mg/kg	0.26 J	0.52 J	0.4 =	0.44 =	0.68 =
Cadmium	mg/kg	0.15 J *	0.27 J *	1.3 = *	1.5 = *	0.55 U
Chromium	mg/kg	5.4 J	10 J	45.7 J *	69.6 J *	14.3 J
Cobalt	mg/kg	4.2 J	6.9 J	5.1 =	5.6 =	9.8 =
Copper	mg/kg	10 J	13.3 J	25.4 = *	27.8 = *	13 =
Lead	mg/kg	14.8 =	19.2 =	99.6 J *	66.8 J *	29.9 J *
Manganese	mg/kg	295 =	499 =	1,580 = *	2,970 = *	796 =
Mercury	mg/kg	0.013 J	0.016 J	0.11 U	0.012 J	0.029 J
Nickel	mg/kg	7.5 =	14.3 =	13.5 =	13.3 =	19.5 =
Selenium	mg/kg	2.2 U	0.55 U	2.2 U	2.2 U	2.2 U
Silver	mg/kg	0.55 U	0.56 U	0.56 U	0.56 U	0.55 U
Thallium	mg/kg	0.27 UJ	0.46 UJ	0.27 J *	0.28 J *	0.33 J *
Zinc	mg/kg	40.9 =	83.5 J *	158 J *	175 J *	55.6 J

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-157**	**LL3-158**	**LL3-159**	**LL3-160**	**LL3-161**
Sample ID		**LL30963**	**LL30966**	**LL30969**	**LL30972**	**LL30975**
Date		**08/13/2001**	**08/13/2001**	**08/13/2001**	**08/13/2001**	**08/13/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	7,590 =	15,100 =	8,310 =	35,200 = *	8,200 =
Antimony	mg/kg	1.1 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.1 UJ
Arsenic	mg/kg	16.8 = *	7.6 =	15.9 = *	1.8 U	11.8 =
Barium	mg/kg	58.4 =	168 = *	61.3 =	311 = *	74.3 =
Beryllium	mg/kg	0.66 =	2.6 = *	0.55 J	4.6 = *	0.44 =
Cadmium	mg/kg	0.62 = *	0.17 J *	0.14 J *	0.6 U	0.52 = *
Chromium	mg/kg	15 =	15.9 J	12.8 =	19.2 J *	12.9 J
Cobalt	mg/kg	9.1 =	2.9 =	9.6 =	1.9 =	7.5 =
Copper	mg/kg	21.4 = *	7.1 =	20 = *	3.3 =	17.3 =
Lead	mg/kg	26.7 = *	16.6 J	19.7 =	3.6 J	48 J *
Manganese	mg/kg	897 =	1,960 = *	408 =	3,500 = *	524 =
Mercury	mg/kg	0.022 J	0.11 U	0.017 J	0.12 U	0.021 J
Nickel	mg/kg	20.1 =	6.8 =	27.5 = *	3 U	15.5 =
Selenium	mg/kg	2.2 U	2.2 U	2.3 U	2.4 U	2.2 U
Silver	mg/kg	0.55 U	0.54 U	0.58 U	0.6 U	0.55 U
Thallium	mg/kg	0.39 UJ	0.2 J *	0.38 UJ	0.24 UJ	0.32 J *
Zinc	mg/kg	68.3 = *	42.8 J	63.5 = *	4.8 U	106 J *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-175**	**LL3-220**	**LL3-221**	**LL3-222**	**LL3-226**
Sample ID		**LL31001**	**LL31075**	**LL31081**	**LL31086**	**LL31092**
Date		**08/09/2001**	**08/07/2001**	**08/07/2001**	**08/07/2001**	**08/24/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	0.6 U	NA	NA
Aluminum	mg/kg	13,200 =	7,540 =	6,410 =	3,230 =	10,900 =
Antimony	mg/kg	1.2 UJ	2.2 UJ	1.2 J *	1.8 J *	1.2 UJ
Arsenic	mg/kg	11.8 =	10.5 =	14.2 =	9.2 J	12.6 =
Barium	mg/kg	65.6 J	70.7 =	122 = *	30.1 J	59.5 =
Beryllium	mg/kg	0.48 =	0.45 =	0.68 =	0.56 =	0.59 J
Cadmium	mg/kg	0.19 = *	2.4 = *	1.2 = *	0.32 = *	0.23 J *
Chromium	mg/kg	16.2 J	18.7 = *	11 =	7 =	13.6 =
Cobalt	mg/kg	7 =	9.5 =	11.3 = *	7.3 J	7.5 =
Copper	mg/kg	10.9 J	72.3 = *	13.9 =	8.2 =	18.4 = *
Lead	mg/kg	18.5 J	91.9 J *	19.1 J	11.4 J	19.3 J
Manganese	mg/kg	463 J	369 =	2,380 = *	341 J	327 =
Mercury	mg/kg	0.052 J *	0.053 UJ	0.037 UJ	0.13 U	0.037 J *
Nickel	mg/kg	10.9 =	19 =	20.9 =	10.7 J	14.5 =
Selenium	mg/kg	0.49 J	2.2 = *	0.54 J	0.5 J	0.64 J
Silver	mg/kg	0.59 U	1.1 U	0.6 U	0.63 U	0.71 = *
Thallium	mg/kg	0.37 J *	0.4 J *	0.32 = *	0.24 J *	0.68 J *
Zinc	mg/kg	51.9 =	455 = *	191 = *	59.7 =	83.8 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-227**	**LL3-229**	**LL3-230**	**LL3-231**	**LL3-244**
Sample ID		**LL31093**	**LL31096**	**LL31098**	**LL31099**	**LL30686**
Date		**08/24/2001**	**08/24/2001**	**08/24/2001**	**08/24/2001**	**08/25/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	11,400 =	10,300 =	8,350 =	9,580 =	11,100 =
Antimony	mg/kg	1.3 UJ	1.1 UJ	1 UJ	1.1 UJ	1.1 UJ
Arsenic	mg/kg	30.2 = *	10.6 =	12.8 =	15.3 =	11.5 =
Barium	mg/kg	80 =	85.3 =	70.2 =	98.4 = *	78 =
Beryllium	mg/kg	1.2 = *	0.51 J	0.61 =	0.61 =	0.66 =
Cadmium	mg/kg	0.4 J *	0.22 J *	1.8 = *	1 = *	0.66 = *
Chromium	mg/kg	21.3 = *	11.8 =	11.4 =	14.2 =	12.4 =
Cobalt	mg/kg	16.3 = *	9 =	7.2 =	15.5 = *	10.1 =
Copper	mg/kg	30.8 = *	8.7 =	20.7 = *	18.1 = *	15.7 =
Lead	mg/kg	25.7 J	18.5 J	35.9 J *	36 J *	26.9 J *
Manganese	mg/kg	684 =	1,230 =	475 =	1,380 =	980 =
Mercury	mg/kg	0.028 J	0.059 J *	0.038 J *	0.032 J	0.038 J *
Nickel	mg/kg	42.9 = *	9.9 =	16.9 =	18.7 =	15.2 =
Selenium	mg/kg	1.1 J	0.97 J	0.4 J	0.92 J	0.75 J
Silver	mg/kg	0.98 = *	0.57 U	0.52 U	0.54 U	0.57 U
Thallium	mg/kg	0.74 J *	0.57 J *	0.57 J *	0.58 J *	0.53 J *
Zinc	mg/kg	102 = *	49.1 =	90.3 = *	94.7 = *	86.5 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3-245**	**LL3sd-035(d)**	**LL3sd-035(d)**	**LL3sd-042**	**LL3ss-001**
Sample ID		**LL30689**	**LL3SD-035(D)-0201-SD**	**LL3SD-035(D)-0202-FD**	**LL3SD-042-0209-SD**	**LL3SS-001-0161-SO**
Date		**08/25/2001**	**07/27/1996**	**07/27/1996**	**08/20/1996**	**07/25/1996**
Depth (ft)		**0 - 1**	**0 - 0**	**0 - 0**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab Composite**	**Field Duplicate**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	11,500 =	6,520 =	6,990 =	10,300 =	6,570 =
Antimony	mg/kg	1.1 UJ	NA	NA	NA	NA
Arsenic	mg/kg	15.5 = *	13.6 J	14.4 J	9.5 =	11.3 =
Barium	mg/kg	106 = *	91.3 = *	68.7 =	76.4 =	63.1 =
Beryllium	mg/kg	0.79 =	NA	NA	NA	NA
Cadmium	mg/kg	0.7 = *	1.6 = *	1.3 = *	0.32 U	3.2 = *
Chromium	mg/kg	13.9 =	14.7 =	13.3 =	13.9 =	15.4 =
Cobalt	mg/kg	18.6 = *	NA	NA	NA	NA
Copper	mg/kg	12.8 =	NA	NA	NA	NA
Lead	mg/kg	33.4 J *	63 = *	41.6 = *	22.2 =	312 = *
Manganese	mg/kg	2140 = *	1,700 J *	723 J	313 J	366 =
Mercury	mg/kg	0.041 J *	0.06 = *	0.06 = *	0.06 = *	0.2 = *
Nickel	mg/kg	19.6 =	NA	NA	NA	NA
Selenium	mg/kg	0.73 J	1.4 J	1.9 J *	1.5 = *	0.54 =
Silver	mg/kg	0.55 U	2.4 = *	3.1 = *	0.26 U	0.2 U
Thallium	mg/kg	0.49 J *	NA	NA	NA	NA
Zinc	mg/kg	85.2 = *	240 = *	225 = *	89.7 = *	626 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-002**	**LL3ss-003**	**LL3ss-003**	**LL3ss-004**	**LL3ss-005**
Sample ID		**LL3SS-002-0162-SO**	**LL3SS-003-0163-SO**	**LL3SS-003-0164-FD**	**LL3SS-004-0166-SO**	**LL3SS-005-0167-SO**
Date		**07/24/1996**	**07/26/1996**	**07/26/1996**	**07/25/1996**	**07/24/1996**
Depth (ft)		**0 - 2**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Field Duplicate**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	0.21 J *	NA	NA	NA	NA
Aluminum	mg/kg	4,750 =	5,690 =	5,980 =	4,650 =	4,020 =
Antimony	mg/kg	4.7 = *	NA	NA	NA	NA
Arsenic	mg/kg	12.3 =	14.8 J	13.1 J	14.4 =	23.2 = *
Barium	mg/kg	447 = *	40.3 =	45.9 =	147 = *	87 =
Beryllium	mg/kg	0.62 =	NA	NA	NA	NA
Cadmium	mg/kg	3.6 = *	0.32 J *	0.29 J *	2.6 = *	4.1 = *
Chromium	mg/kg	23.6 = *	10.2 J	10.8 J	13.4 =	150 = *
Cobalt	mg/kg	7.6 =	NA	NA	NA	NA
Copper	mg/kg	99.4 = *	NA	NA	NA	NA
Lead	mg/kg	229 = *	23.8 J	22.6 J	151 = *	524 = *
Manganese	mg/kg	448 =	580 =	648 =	540 =	990 =
Mercury	mg/kg	0.04 U	0.03 U	0.03 U	0.04 = *	0.04 U
Nickel	mg/kg	21.9 = *	NA	NA	NA	NA
Selenium	mg/kg	0.47 J	0.85 =	0.83 =	0.35 J	4.1 = *
Silver	mg/kg	0.36 J *	0.2 U	0.2 U	0.19 U	0.22 U
Thallium	mg/kg	1.7 = *	NA	NA	NA	NA
Zinc	mg/kg	453 = *	69.5 J *	60.9 J	312 = *	168 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-006**	**LL3ss-007**	**LL3ss-008**	**LL3ss-008**	**LL3ss-009**
Sample ID		**LL3SS-006-0168-SO**	**LL3SS-007-0169-SO**	**LL3SS-008-0170-SO**	**LL3SS-008-0174-FD**	**LL3SS-009-0171-SO**
Date		**07/25/1996**	**07/24/1996**	**07/25/1996**	**07/25/1996**	**07/24/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Field Duplicate**	**Grab Composite**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	7,170 =	5,440 =	5,730 =	4,280 =	13,100 =
Antimony	mg/kg	NA	NA	NA	NA	NA
Arsenic	mg/kg	12.4 =	10.1 =	11.6 =	10.9 =	15.8 = *
Barium	mg/kg	43.1 =	65.5 =	36.5 =	36.6 =	50.6 =
Beryllium	mg/kg	NA	NA	NA	NA	NA
Cadmium	mg/kg	4.1 = *	2 = *	0.29 J *	0.39 J *	0.5 J *
Chromium	mg/kg	9.6 =	11.8 =	8.7 =	7.4 =	16.2 =
Cobalt	mg/kg	NA	NA	NA	NA	NA
Copper	mg/kg	NA	NA	NA	NA	NA
Lead	mg/kg	15.3 =	72.4 = *	17.3 =	21.2 =	18.4 =
Manganese	mg/kg	461 =	242 =	321 =	299 =	150 =
Mercury	mg/kg	0.03 U	0.08 = *	0.03 U	0.03 U	0.04 U
Nickel	mg/kg	NA	NA	NA	NA	NA
Selenium	mg/kg	0.6 =	0.43 J	0.39 J	0.34 J	1.2 =
Silver	mg/kg	0.19 U	0.2 U	0.19 U	0.19 =	0.2 U
Thallium	mg/kg	NA	NA	NA	NA	NA
Zinc	mg/kg	49.4 =	151 = *	58.9 =	68.2 = *	91 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-010**	**LL3ss-011**	**LL3ss-012**	**LL3ss-013**	**LL3ss-014**
Sample ID		**LL3SS-010-0172-SO**	**LL3SS-011-0173-SO**	**LL3SS-012-0175-SO**	**LL3SS-013-0176-SO**	**LL3SS-014-0177-SO**
Date		**07/24/1996**	**07/24/1996**	**07/24/1996**	**07/24/1996**	**07/24/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**	**0 - 1**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	NA	NA	NA	NA
Aluminum	mg/kg	8,300 =	8,150 =	8,550 =	9,190 =	3,720 =
Antimony	mg/kg	NA	NA	NA	NA	NA
Arsenic	mg/kg	11.4 =	11.9 =	12.7 =	12.6 =	9.9 =
Barium	mg/kg	51 =	56.4 =	68.1 =	69.2 =	16.1 =
Beryllium	mg/kg	NA	NA	NA	NA	NA
Cadmium	mg/kg	0.21 J *	1.6 = *	3.2 = *	1.6 = *	0.17 J *
Chromium	mg/kg	11.2 =	14.9 =	12.9 =	14.4 =	4.9 =
Cobalt	mg/kg	NA	NA	NA	NA	NA
Copper	mg/kg	NA	NA	NA	NA	NA
Lead	mg/kg	17.3 =	55.8 = *	58.8 = *	2,620 = *	11.1 =
Manganese	mg/kg	367 =	363 =	304 =	520 =	162 =
Mercury	mg/kg	0.04 U	0.06 = *	0.05 = *	0.1 = *	0.04 U
Nickel	mg/kg	NA	NA	NA	NA	NA
Selenium	mg/kg	0.47 J	0.57 =	0.65 =	0.33 U	0.32 U
Silver	mg/kg	0.19 U	0.2 U	0.2 U	0.49 J *	0.2 U
Thallium	mg/kg	NA	NA	NA	NA	NA
Zinc	mg/kg	62.3 = *	179 = *	129 = *	149 = *	58.4 =

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-015**	**LL3ss-016**	**LL3ss-017**	**LL3ss-018**	**LL3ss-019**
Sample ID		**LL3SS-015-0178-SO**	**LL3SS-016-0179-SO**	**LL3SS-017-0180-SO**	**LL3SS-018-0181-SO**	**LL3SS-019-0182-SO**
Date		**07/24/1996**	**07/24/1996**	**07/25/1996**	**07/25/1996**	**07/25/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	mg/kg	NA	0.2 J *	NA	NA	NA
Aluminum	mg/kg	8,700 =	9,190 =	11,400 =	9,100 =	15,600 =
Antimony	mg/kg	NA	0.31 U	NA	NA	NA
Arsenic	mg/kg	14.4 =	11.7 =	8.4 =	13.2 =	14.3 =
Barium	mg/kg	79 =	66.7 =	68.7 =	55.1 =	55.1 =
Beryllium	mg/kg	NA	0.52 =	NA	NA	NA
Cadmium	mg/kg	0.94 = *	0.46 J *	0.12 J *	0.17 J *	0.1 J *
Chromium	mg/kg	14.7 =	12 =	13.3 =	12.3 =	17.3 =
Cobalt	mg/kg	NA	8.7 =	NA	NA	NA
Copper	mg/kg	NA	14.1 =	NA	NA	NA
Lead	mg/kg	49.8 = *	26.9 = *	11.9 =	15.1 =	12.6 =
Manganese	mg/kg	303 =	717 =	197 =	316 =	75.3 =
Mercury	mg/kg	0.04 U	0.03 U	0.03 U	0.04 U	0.03 U
Nickel	mg/kg	NA	14 =	NA	NA	NA
Selenium	mg/kg	0.57 =	0.75 =	0.5 J	0.51 J	0.91 =
Silver	mg/kg	0.2 U	0.2 U	0.19 U	2.4 = *	0.2 U
Thallium	mg/kg	NA	2.2 = *	NA	NA	NA
Zinc	mg/kg	93.9 = *	60.9 =	49.8 =	57.1 =	47.7 =

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-020**	**LL3ss-020**	**LL3ss-021**	**LL3ss-022**	**LL3ss-026**
Sample ID		**LL3SS-020-0183-SO**	**LL3SS-020-0184-FD**	**LL3SS-021-0185-SO**	**LL3SS-022-0186-SO**	**LL3SS-026-0190-SO**
Date		**07/25/1996**	**07/25/1996**	**07/25/1996**	**07/25/1996**	**07/25/1996**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 0**	**0 - 2**	**0 - 1**
Sample Type		**Grab Composite**	**Field Duplicate**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
General Chemistry						
Chromium, hexavalent	mg/kg	NA	NA	NA	NA	NA
Inorganics						
Cyanide	Mg/kg	0.16 J *	0.13 J *	NA	NA	NA
Aluminum	mg/kg	6,230 J	8,520 J	13,000 =	23,900 = *	5,530 =
Antimony	mg/kg	0.31 J	0.3 J	NA	NA	NA
Arsenic	mg/kg	11.1 =	13.3 =	12.8 =	9.6 =	12.2 =
Barium	mg/kg	49.2 J	58.6 J	140 = *	261 = *	46 =
Beryllium	mg/kg	0.59 =	0.64 =	NA	NA	NA
Cadmium	mg/kg	0.17 = *	0.19 = *	0.24 J *	0.26 J *	0.32 J *
Chromium	mg/kg	8.3 =	10.5 =	10 =	16.3 =	31.6 = *
Cobalt	mg/kg	3.7 =	4.6 =	NA	NA	NA
Copper	mg/kg	8.9 J	11.5 J	NA	NA	NA
Lead	mg/kg	20.8 =	20.8 =	21.2 =	20.6 =	129 = *
Manganese	mg/kg	512 =	606 =	2,300 = *	4,800 = *	426 =
Mercury	mg/kg	0.03 =	0.03 =	0.03 U	0.03 U	0.04 U
Nickel	mg/kg	7 =	10.9 =	NA	NA	NA
Selenium	mg/kg	0.74 =	0.75 =	0.66 =	0.99 =	0.45 J
Silver	mg/kg	0.2 =	0.19 =	0.19 U	0.28 J *	0.2 U
Thallium	mg/kg	1.8 = *	2.1 = *	NA	NA	NA
Zinc	mg/kg	35.3 J	37.5 J	30.9 =	40.5 =	83.4 = *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-026**	**LL3ss-027**	**LL3ss-028**	**LL3ss-029**
Sample ID		**LL3SS-026-0191-FD**	**LL3SS-027-0193-SO**	**LL3SS-028-0194-SO**	**LL3SS-029-0195-SO**
Date		**07/25/1996**	**07/27/1996**	**07/27/1996**	**07/26/1996**
Depth (ft)		**0 - 1**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Field Duplicate**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**				
General Chemistry					
Chromium, hexavalent	mg/kg	NA	NA	NA	NA
Inorganics					
Cyanide	mg/kg	NA	NA	0.38 J *	NA
Aluminum	mg/kg	4,530 =	9,570 =	10,500 =	6,920 =
Antimony	mg/kg	NA	NA	0.34 UJ	NA
Arsenic	mg/kg	9.8 =	13.3 J	14.6 J	14.5 J
Barium	mg/kg	39.9 =	55.7 =	95.8 = *	86.7 =
Beryllium	mg/kg	NA	NA	1.2 = *	NA
Cadmium	mg/kg	0.53 = *	0.06 J *	0.41 J *	0.54 = *
Chromium	mg/kg	13.7 =	12.3 =	13.2 =	11.9 J
Cobalt	mg/kg	NA	NA	7.6 =	NA
Copper	mg/kg	NA	NA	17.7 =	NA
Lead	mg/kg	67.5 = *	15.2 =	29.5 = *	53.9 J *
Manganese	mg/kg	574 =	573 J	919 J	827 =
Mercury	mg/kg	0.04 U	0.03 U	0.04 U	0.03 U
Nickel	mg/kg	NA	NA	16.9 =	NA
Selenium	mg/kg	1 =	1.3 J	1.4 J	0.73 =
Silver	mg/kg	0.19 U	0.19 U	0.21 U	0.2 U
Thallium	mg/kg	NA	NA	3.2 J *	NA
Zinc	mg/kg	86.3 = *	53.8 =	72.1 = *	86.3 J *

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-030**	**LL3ss-031**	**LL3ss-032**	**LL3ss-033**
Sample ID		**LL3SS-030-0196-SO**	**LL3SS-031-0197-SO**	**LL3SS-032-0198-SO**	**LL3SS-033-0199-SO**
Date		**07/26/1996**	**07/26/1996**	**07/26/1996**	**07/26/1996**
Depth (ft)		**0 - 2**	**0 - 2**	**0 - 2**	**0 - 1**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**				
General Chemistry					
Chromium, hexavalent	mg/kg	NA	NA	NA	NA
Inorganics					
Cyanide	mg/kg	0.36 J *	NA	NA	NA
Aluminum	mg/kg	6,770 J	4,960 =	5,380 =	7,500 =
Antimony	mg/kg	0.33 J	NA	NA	NA
Arsenic	mg/kg	12.7 =	13.3 J	7 J	9.3 J
Barium	mg/kg	85.7 J	49.3 =	68.4 =	53.7 =
Beryllium	mg/kg	0.68 =	NA	NA	NA
Cadmium	mg/kg	0.42 = *	1.4 = *	0.83 = *	0.25 J *
Chromium	mg/kg	10.3 =	11.9 J	8.6 J	9.9 J
Cobalt	mg/kg	7.3 =	NA	NA	NA
Copper	mg/kg	22.5 J *	NA	NA	NA
Lead	mg/kg	46.7 = *	36.9 J *	77.9 J *	27.9 J *
Manganese	mg/kg	917 =	527 =	759 =	425 =
Mercury	mg/kg	0.05 = *	0.03 U	0.04 =	0.03 U
Nickel	mg/kg	13.8 =	NA	NA	NA
Selenium	mg/kg	1.1 =	0.48 J	0.43 =	0.74 =
Silver	mg/kg	0.21 =	0.2 U	0.2 =	0.19 U
Thallium	mg/kg	3.5 = *	NA	NA	NA
Zinc	mg/kg	81.9 J *	84.6 J *	187 J *	50.3 J

Table 4-20. Summary Data for Site-Related Inorganics in Explosive Areas Handling Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate	Explosives Handling Areas Aggregate
Station ID		**LL3ss-034**	**LL3ss-036**	**LL3ss-037**
Sample ID		**LL3SS-034-0200-SO**	**LL3SS-036-0203-SO**	**LL3SS-037-0204-SO**
Date		**07/26/1996**	**07/26/1996**	**07/26/1996**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 2**
Sample Type		**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**			
General Chemistry				
Chromium, hexavalent	mg/kg	NA	NA	NA
Inorganics				
Cyanide	mg/kg	NA	NA	NA
Aluminum	mg/kg	4,860 =	7,010 =	8,080 J
Antimony	mg/kg	NA	NA	NA
Arsenic	mg/kg	14.2 J	21.9 J *	18 = *
Barium	mg/kg	99.3 = *	53.5 =	50.9 =
Beryllium	mg/kg	NA	NA	NA
Cadmium	mg/kg	1.4 = *	0.35 J *	0.35 J *
Chromium	mg/kg	38.5 J *	11.1 J	13 =
Cobalt	mg/kg	NA	NA	NA
Copper	mg/kg	NA	NA	NA
Lead	mg/kg	157 J *	31.2 J *	23 =
Manganese	mg/kg	525 =	807 =	494 =
Mercury	mg/kg	0.04 U	0.03 U	0.03 U
Nickel	mg/kg	NA	NA	NA
Selenium	mg/kg	0.9 =	1.2 =	1.8 = *
Silver	mg/kg	0.34 J *	0.2 U	0.2 U
Thallium	mg/kg	NA	NA	NA
Zinc	mg/kg	204 J *	64.3 J *	72.6 = *

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
ID = Identification.
NA = Not analyzed.
* - Exceeds Ravenna Army Ammunition Plant background criteria.
= - Detected result.
J - Estimated result.
U - Not detected.

4.2.4.4 Packaging and Shipping Areas Aggregate

As presented in Table 4-3, seven surface soil samples were collected from the Packaging and Shipping Areas Aggregate with a total of 18 metals detected at least once in the surface soil samples collected. Of these, four metals, cobalt, nickel, selenium, and vanadium were eliminated as SRCs, as all concentrations were detected below the established background concentrations.

For those metals retained as SRCs in surface soil, 11 were detected in 7 of 7 surface samples collected (Table 4-3). Of the 14 metals identified as SRCs, cadmium, lead, mercury, thallium, and zinc were detected most frequently above their respective background concentrations. Silver, beryllium, and antimony were detected at the lowest frequency.

Sample station LL3-077 exhibited the highest concentrations of 12 metals detected (Table 4-21) in the surface soil including all of the pervasive metals listed above. LL3-077 is located along the railroad track to the west of Building EB-11. The highest reported values for cadmium lead, mercury, and zinc were 37.3; 1,570; 0.1; and 1,540 mg/kg, respectively (Figures 4-3 through 4-5).

Sampling stations LL3-071 and LL3-072 contained eight metal compounds each and are located along the northern boundary of Building EB-13. In general, the detected metals were found to be widely and randomly distributed throughout the aggregate.

Table 4-21 provides a summary of all metals detected in the surface soil associated with the Packaging and Shipping Areas Aggregate.

4.2.4.5 DLA Storage Tanks Area Aggregate

As presented in Table 4-3, 19 surface soil samples were collected for analysis of TAL metals from the DLA Storage Tanks Aggregate, with a total of 17 metals detected at least once in surface soil samples collected. One compound, vanadium, was eliminated as an SRC, as all concentrations were detected below the established background concentrations.

For those metals retained as SRCs in surface soil, 10 were detected in 19 of 19 surface samples collected. Of the metals identified as SRCs, antimony and cadmium were considered most pervasive across the site, as they were detected at the highest frequency above background. Table 4-22 provides a detailed summary of all metals detected in the surface soil associated with the DLA Storage Tanks Area Aggregate.

Antimony was identified in 13 of 19 samples collected with reported values ranging between 0.92 (LL3-195) and 825 mg/kg (LL3-185). Sample station LL3-185 is located just north of the northernmost DLA storage tank structure (Figures 4-6 and 4-7). The second highest concentration (65.7 mg/kg) detected was identified in the sample collected from station LL3-189 (Figure 4-7). With the exception of LL3-185, the majority of higher antimony concentrations appear to be associated with the southern most grouping of DLA storage tanks.

Arsenic was identified in 19 of 19 surface soil samples collected with reported values ranging between 7.4 (LL3-196) and 15.5 mg/kg (LL3-192). Sample station LL3-192 is located on the eastern side of the railroad tracks in the southern DLA storage tank farm area (Figure 4-7).

Cadmium was identified above background in 12 of 19 surface soil sample collected. The highest concentration (3.2 mg/kg) was reported at Station LL3-195 (Figure 4-7).

Table 4-21. Summary Data for Site-Related Inorganics in Packaging and Shipping Area Aggregate Surface Soils at Load Line 3

Functional Area		Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate
Station ID		**LL3-071**	**LL3-072**	**LL3-073**	**LL3-074**	**LL3-074**
Sample ID		**LL30727**	**LL30730**	**LL30733**	**LL30736**	**LL31124**
Date		**08/08/2001**	**08/09/2001**	**08/09/2001**	**08/09/2001**	**08/09/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Field Duplicate**
Analyte	**Units**					
Inorganics						
Aluminum	mg/kg	9,290 =	11,900 =	4,670 =	6,360 =	5,450 =
Antimony	mg/kg	1.1 UJ	0.59 UJ	1.1 UJ	1.2 UJ	1.2 UJ
Arsenic	mg/kg	11.6 =	16.7 = *	12.1 =	11.8 =	10.4 =
Barium	mg/kg	250 = *	141 = *	39.7 =	44 =	42.5 =
Beryllium	mg/kg	0.9 = *	1.4 = *	0.28 U	0.45 J	0.41 J
Cadmium	mg/kg	0.83 = *	0.42 J *	0.7 = *	0.41 J *	0.48 J *
Chromium	mg/kg	10.8 =	12.8 =	9.3 =	11.4 =	11.4 =
Copper	mg/kg	17.8 J *	15.4 J	18.8 J *	13.2 J	15.6 J
Lead	mg/kg	44.4 J *	34.2 J *	41 J *	36.7 J *	40.8 J *
Manganese	mg/kg	783 =	1,100 =	362 =	639 =	466 =
Mercury	mg/kg	0.072 J *	0.07 J *	0.068 J *	0.16 = *	0.23 = *
Silver	mg/kg	0.57 U	0.58 U	0.55 U	0.59 U	0.6 U
Thallium	mg/kg	0.25 J *	0.29 J *	0.24 J *	0.24 J *	0.27 J *
Zinc	mg/kg	303 = *	93.9 = *	165 = *	139 = *	142 = *

Table 4-21. Summary Data for Site-Related Inorganics in Packaging and Shipping Area Aggregate Surface Soils at Load Line 3 (continued)

Functional Area		Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate	Packaging and Shipping Areas Aggregate
Station ID		**LL3-075**	**LL3-076**	**LL3-077**	**LL3-077**
Sample ID		**LL30739**	**LL30742**	**LL30745**	**LL31131**
Date		**08/09/2001**	**08/09/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Field Duplicate**
Analyte	**Units**				
Inorganics					
Aluminum	mg/kg	10,200 =	4,540 =	23,800 = *	17,000 =
Antimony	mg/kg	1.1 UJ	0.58 UJ	33.6 J *	166 J *
Arsenic	mg/kg	12.2 =	8.1 =	6.1 =	22.8 = *
Barium	mg/kg	75.5 =	33.4 =	816 J *	2,340 J *
Beryllium	mg/kg	0.87 =	0.31 U	3.4 = *	3.3 = *
Cadmium	mg/kg	0.24 J *	0.33 J *	37.3 = *	58.2 = *
Chromium	mg/kg	12 =	8.7 =	136 = *	1,050 J *
Copper	mg/kg	11 J	11 J	116 J *	236 J *
Lead	mg/kg	15 J	26 J	1,570 J *	8,950 J *
Manganese	mg/kg	827 =	252 =	3,260 J *	2,670 J *
Mercury	mg/kg	0.051 J *	0.015 J	0.59 = *	0.87 = *
Silver	mg/kg	0.55 U	0.56 U	27.7 = *	1.8 = *
Thallium	mg/kg	0.28 J *	0.3 J *	0.27 J *	0.15 J *
Zinc	mg/kg	53.5 =	56.1 =	1540 = *	3,700 = *

ID = Identification.
* - Exceeds Ravenna Army Ammunition Plant background criteria.
= - Detected result.
J - Estimated result.
U - Not detected.

Table 4-22. Summary Data for Site-Related Inorganics in DLA Storage Tank Area Aggregate Surface Soils at Load Line 3 [a]

Functional Area		DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate
Station ID		**LL3-182**	**LL3-183**	**LL3-184**	**LL3-185**	**LL3-186**	**LL3-187**
Sample ID		**LL31008**	**LL31009**	**LL31010**	**LL31011**	**LL31012**	**LL31013**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**						
Inorganics							
Antimony	mg/kg	1.6 J *	1.1 UJ	1.1 UJ	825 J *	17.3 J *	1.6 J *
Arsenic	mg/kg	10.7 =	9.5 =	13.4 =	10.2 =	13 =	9.2 =
Barium	mg/kg	147 J *	65.9 =	53.2 =	71.5 =	73.4 =	135 = *
Beryllium	mg/kg	0.95 = *	0.53 J	0.6 =	0.59 =	0.7 =	1 = *
Cadmium	mg/kg	0.099 J *	0.14 J *	0.17 J *	0.27 J *	0.29 J *	0.18 J *
Chromium	mg/kg	13.1 J	12.1 =	16.7 J	16.6 J	12.9 J	13.6 J
Cobalt	mg/kg	6.7 =	7.5 =	6.4 J	7.2 J	7.4 J	5.8 J
Copper	mg/kg	9.3 J	6.4 =	17.6 J	10.8 J	7.7 J	7 J
Lead	mg/kg	25.2 J	22.2 =	15 =	30.3 = *	22 =	12.3 =
Manganese	mg/kg	1,500 J *	678 =	259 =	683 =	1,870 = *	1,610 = *
Mercury	mg/kg	0.036 J	0.056 J *	0.055 J *	0.04 J *	0.044 J *	0.044 J *
Nickel	mg/kg	11.3 =	10.3 =	15.3 =	11.2 =	11 =	9.3 =
Selenium	mg/kg	2.3 U	2.2 U	2.2 U	0.53 U	2.4 U	2.3 U
Thallium	mg/kg	0.3 J *	0.41 UJ	0.39 UJ	0.23 U	0.45 UJ	0.18 U
Zinc	mg/kg	50.5 =	45.2 =	51 =	57 =	49.9 =	38.6 =

Table 4-22. Summary Data for Site-Related Inorganics in DLA Storage Tank Area Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate
Station ID		**LL3-188**	**LL3-189**	**LL3-189**	**LL3-190**	**LL3-191**	**LL3-192**
Sample ID		**LL31014**	**LL31015**	**LL31136**	**LL31016**	**LL31017**	**LL31018**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/11/2001**	**08/11/2001**	**08/11/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Field Duplicate**	**Grab**	**Grab**	**Grab**
Analyte	**Units**						
Inorganics							
Antimony	mg/kg	55.2 J *	63.4 J *	65.7 J *	14.6 J *	21.2 J *	35.7 J *
Arsenic	mg/kg	12.5 =	9.1 =	11.6 =	14.1 =	12.9 =	15.5 = *
Barium	mg/kg	99 = *	126 = *	117 = *	63.1 =	70.1 =	93.8 = *
Beryllium	mg/kg	0.84 =	1.1 = *	0.81 =	0.64 J	0.64 J	0.89 J *
Cadmium	mg/kg	0.33 J *	0.82 = *	0.91 = *	0.15 U	0.27 J *	0.41 J *
Chromium	mg/kg	14.6 J	117 J *	115 J *	15.5 =	12.3 =	16.7 =
Cobalt	mg/kg	9.8 J	8.3 J	10.1 J	11.3 = *	8.6 =	12.1 = *
Copper	mg/kg	9.4 J	10.3 J	11.5 J	20 = *	11 =	18.2 = *
Lead	mg/kg	21.2 =	942 = *	884 = *	16.6 J	25.2 J	38 J *
Manganese	mg/kg	1350 =	1,630 = *	1,240 =	215 =	858 =	584 =
Mercury	mg/kg	0.12 U	0.088 J *	0.086 J *	0.11 U	0.042 J *	0.035 J
Nickel	mg/kg	14 =	9.3 =	10.9 =	22 = *	13.5 =	25.4 = *
Selenium	mg/kg	0.6 U	0.58 U	0.45 U	2.3 U	2.3 U	2.3 U
Thallium	mg/kg	0.46 UJ	0.43 UJ	0.44 UJ	0.34 U	0.36 = *	0.37 = *
Zinc	mg/kg	86.3 = *	232 = *	248 = *	55.5 J	51.8 J	126 J *

Table 4-22. Summary Data for Site-Related Inorganics in DLA Storage Tank Area Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate
Station ID		**LL3-193**	**LL3-194**	**LL3-195**	**LL3-196**	**LL3-197**	**LL3-198**
Sample ID		**LL31019**	**LL31020**	**LL31021**	**LL31022**	**LL31023**	**LL31024**
Date		**08/11/2001**	**08/11/2001**	**08/11/2001**	**08/11/2001**	**08/11/2001**	**08/11/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**						
Inorganics							
Antimony	mg/kg	1.8 J *	1.2 J *	0.92 J	1.1 UJ	1.2 UJ	1.1 UJ
Arsenic	mg/kg	8.8 =	14.1 =	9.6 =	7.4 =	12 =	11.1 =
Barium	mg/kg	141 = *	73.1 =	190 = *	183 = *	73.8 =	49.4 =
Beryllium	mg/kg	1.3 J *	0.63 J	1.7 J *	1.5 J *	0.56 J	0.57 J
Cadmium	mg/kg	0.29 J *	0.13 U	3.2 = *	0.19 U	0.13 U	0.16 U
Chromium	mg/kg	13.7 =	17 =	21.1 = *	11.1 =	16.3 =	12.5 =
Cobalt	mg/kg	7.5 =	5.1 =	10.9 = *	6.4 =	6.3 =	8.2 =
Copper	mg/kg	10 =	17.4 =	30.5 = *	7.2 =	15 =	16.4 =
Lead	mg/kg	22.4 J	19.5 J	1,480 J *	12.9 J	24.2 J	16.4 J
Manganese	mg/kg	1,980 = *	393 =	1,250 =	2,510 = *	313 =	286 =
Mercury	mg/kg	0.031 J	0.028 J	0.024 J	0.11 U	0.019 J	0.014 J
Nickel	mg/kg	11 =	15 =	15.7 =	8.3 =	15.9 =	16.5 =
Selenium	mg/kg	0.45 J	2.2 U	0.38 J	0.66 J	2.3 U	2.3 U
Thallium	mg/kg	0.34 U	0.35 = *	0.22 U	0.25 U	0.38 = *	0.33 U
Zinc	mg/kg	52 J	43.7 J	133 J *	35.6 J	56 J	43.7 J

Table 4-22. Summary Data for Site-Related Inorganics in DLA Storage Tank Area Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		DLA Storage Tanks Aggregate	DLA Storage Tanks Aggregate
Station ID		**LL3-199**	**LL3ss-043**
Sample ID		**LL31025**	**LL3SS-043-0210-SO**
Date		**08/11/2001**	**08/20/1996**
Depth (ft)		**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab Composite**
Analyte	**Units**		
Inorganics			
Antimony	mg/kg	1.2 UJ	30 = *
Arsenic	mg/kg	12.1 =	12.6 =
Barium	mg/kg	115 = *	52.5 =
Beryllium	mg/kg	0.73 J	0.55 =
Cadmium	mg/kg	0.15 U	0.07 U
Chromium	mg/kg	12.2 =	15.1 =
Cobalt	mg/kg	7.3 =	7.4 =
Copper	mg/kg	7.3 =	14.3 =
Lead	mg/kg	38.8 J *	13.7 =
Manganese	mg/kg	1,180 =	233 =
Mercury	mg/kg	0.054 J *	0.1 = *
Nickel	mg/kg	9.9 =	16.1 =
Selenium	mg/kg	2.4 U	1.6 = *
Thallium	mg/kg	0.35 U	2.7 = *
Zinc	mg/kg	43 J	47.4 =

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
DLA = Defense Logistics Agency.
ID = Identification.
* - Exceeds Ravenna Army Ammunition Plant background criteria.
= - Detected result.
J - Estimated result.
U - Not detected.

Lead was identified in 19 of 19 surface soil samples collected with reported values ranging between 12.3 (LL3-187) and 1,480 mg/kg (LL3-195). Sample station LL3-195 is located along the eastern side of the railroad tracks, just south of the southernmost DLA storage tank. Lead was identified in the sample collected from station LL3-189 at a concentration of 942 mg/kg, which is located just north of the southernmost DLA storage tank farm area. The remaining lead concentrations were all below 38.8 mg/kg and distributed randomly throughout the DLA Storages Tank Aggregate (Figures 4-9 and 4-10).

Manganese was identified in 19 of 19 surface soil samples collected with reported values ranging between 215 (LL3-190) and 2,510 mg/kg (LL3-196). LL3-196 is located south of the southernmost DLA storage tank farm area. Manganese was identified in 9 samples at concentrations exceeding 1,000 mg/kg (Table 4-22). With the exception of LL3-185 and LL3-186, the highest concentrations appear throughout the southernmost DLA storage tank farm area.

Sample station LL3-195, which is located in the southern portion of the DLA storage tank farm, contained the highest detected concentrations of eight metal constituents. In general, the highest frequency of detected metal constituents is located in and near the southernmost DLA storage tank farm (Figure 4-7).

4.2.4.6 West Ditches Aggregate

As presented in Table 4-3, 11 Phase II RI and 5 Phase I RI surface soil samples were collected and submitted for analysis of metals with a total of 17 metals detected at least once in surface soil samples collected from the West Ditches Aggregate. Two compounds, aluminum and vanadium, were eliminated as SRCs as all concentrations were detected below the established background concentrations.

For the 15 metals retained as SRCs in surface soil, 6 were detected in 16 of 16 (includes Phase I Sampling Stations) surface soil samples and 5 were detected in 11 of 11 surface soil samples collected. Cadmium, lead, mercury, and zinc were detected at the highest frequency above background, while antimony, beryllium, chromium, and manganese were detected at the lowest frequency above background. Table 4-23 presents a summary of all metals detected in the surface soils associated with the West Ditches Aggregate.

The sample collected from station LL3-049(p2) exhibited the highest detected concentrations of barium, beryllium, cobalt, manganese, and mercury. Sample station LL3-216 exhibited the highest detected concentrations of antimony, chromium, copper, lead, selenium, and thallium.

The highest concentration of cadmium (1.9 mg/kg) was identified at station LL3-047(p2), which is located on the western tip of the central West Ditch (northwest of Building EB-8). The highest concentration of lead (873 mg/kg) was reported at station LL3-219, which is located on the eastern tip of the northernmost West Ditch. The highest concentration of mercury was identified at station LL3-049(p2), which is located at the western tip of the southernmost West Ditch. The highest detected concentration of zinc was reported at station LL3sd/sw-048(d), which is located on the eastern tip of the West Ditch, just north of Building E-22 (Figure 4-12). The distribution of the pervasive inorganic constituents is indicative of the random nature of the inorganics detected within the West Ditches surface soil/dry sediment.

4.2.4.7 Perimeter Area Aggregate

As presented in Table 4-3, a total of 18 metals plus cyanide were detected at least once in surface soil samples collected from the Perimeter Area Aggregate. Of these, two compounds, aluminum and vanadium, were eliminated as SRCs as all concentrations were detected below the established background concentrations.

Table 4-23. Summary Data for Site-Related Inorganics in West Ditches Surface Soil at Load Line 3 [a]

Functional Area		West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate
Station ID		**LL3-046(p2)**	**LL3-047(p2)**	**LL3-049(p2)**	**LL3-050(p2)**
Sample ID		**LL31065**	**LL31069**	**LL31082**	**LL31084**
Date		**08/08/2001**	**08/08/2001**	**08/08/2001**	**08/08/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**				
Inorganics					
Antimony	mg/kg	1.2 UJ	1.3 UJ	2.1 UJ	1.3 UJ
Arsenic	mg/kg	16.5 = *	22.3 = *	16.6 = *	9.9 =
Barium	mg/kg	146 = *	70.9 =	185 = *	85.5 =
Beryllium	mg/kg	1.1 = *	0.79 =	1.4 = *	0.84 =
Cadmium	mg/kg	0.39 J *	1.9 = *	1.5 = *	0.39 J *
Chromium	mg/kg	15.5 J	15.1 =	12.7 J	12.7 J
Cobalt	mg/kg	15.5 = *	11.8 = *	30.6 = *	6.6 =
Copper	mg/kg	15.7 =	26.6 = *	10.9 =	14.5 =
Lead	mg/kg	18.5 =	42.7 J *	31.9 = *	29.7 = *
Manganese	mg/kg	2,620 = *	1,160 J	4,620 = *	790 =
Mercury	mg/kg	0.028 J	0.054 J *	0.23 = *	0.096 J *
Nickel	mg/kg	22.1 = *	30.5 J *	23.6 = *	13 =
Selenium	mg/kg	2.4 U	1.8 = *	5.3 U	0.44 J
Silver	mg/kg	0.61 U	0.32 J *	1.3 U	0.64 U
Thallium	mg/kg	0.32 = *	0.35 = *	0.33 = *	0.27 = *
Zinc	mg/kg	78.1 = *	224 J *	182 = *	71.8 = *

Table 4-23. Summary Data for Site-Related Inorganics in West Ditches Surface Soil at Load Line 3 [a] (continued)

Functional Area		West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate
Station ID		**LL3-162**	**LL3-163**	**LL3-169**	**LL3-170**
Sample ID		**LL30978**	**LL30981**	**LL30995**	**LL30996**
Date		**08/13/2001**	**08/13/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**				
Inorganics					
Antimony	mg/kg	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ
Arsenic	mg/kg	14.1 =	12.4 =	12 =	9.6 =
Barium	mg/kg	70.3 =	64.3 =	75.3 =	104 = *
Beryllium	mg/kg	0.86 =	0.71 =	0.66 =	0.83 =
Cadmium	mg/kg	0.77 = *	0.39 J *	0.26 J *	0.45 J *
Chromium	mg/kg	16 =	11.3 =	13 =	11.6 J
Cobalt	mg/kg	9.8 =	9.5 =	9 =	11.4 J *
Copper	mg/kg	26.5 = *	11.1 =	9.9 =	14.9 J
Lead	mg/kg	39 = *	22 =	20.3 =	21.8 =
Manganese	mg/kg	752 =	864 =	898 =	1,360 =
Mercury	mg/kg	0.068 J *	0.022 J	0.068 J *	0.065 J *
Nickel	mg/kg	16.5 =	13.5 =	15.4 =	14.1 =
Selenium	mg/kg	2.4 U	2.4 U	0.47 U	2.4 U
Silver	mg/kg	0.55 J *	0.61 U	0.58 U	0.59 U
Thallium	mg/kg	0.4 UJ	0.39 UJ	0.42 UJ	0.45 UJ
Zinc	mg/kg	247 = *	313 = *	60.6 =	74.9 = *

Table 4-23. Summary Data for Site-Related Inorganics in West Ditches Surface Soil at Load Line 3 [a] (continued)

Functional Area		West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate
Station ID		**LL3-216**	**LL3-219**	**LL3sd-046(d)**	**LL3sd/sw-047(d)**
Sample ID		**LL31064**	**LL31068**	**LL3SD-046(D)-0213-SD**	**LL3SD-047(D)-0214-SD**
Date		**08/07/2001**	**08/07/2001**	**07/27/1996**	**07/27/1996**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 2**	**0 - 2**
Sample Type		**Grab**	**Grab**	**Grab Composite**	**Grab Composite**
Analyte	**Units**				
Inorganics					
Antimony	mg/kg	1.2 UJ	177 J *	NA	NA
Arsenic	mg/kg	13 J	20.7 = *	18.8 J *	14 J
Barium	mg/kg	57.1 J	111 = *	74.1 =	67.7 =
Beryllium	mg/kg	0.89 = *	0.5 =	NA	NA
Cadmium	mg/kg	1.5 = *	1.4 = *	0.04 U	0.25 J *
Chromium	mg/kg	22.7 = *	114 = *	18.1 = *	14.1 =
Cobalt	mg/kg	7 J	10.9 = *	NA	NA
Copper	mg/kg	29.6 = *	1,070 = *	NA	NA
Lead	mg/kg	87.8 J *	873 J *	16.6 =	19.3 =
Manganese	mg/kg	482 J	213 =	361 J	685 J
Mercury	mg/kg	0.057 J *	0.14 J *	0.03 U	0.03 U
Nickel	mg/kg	23.3 J *	14.9 =	NA	NA
Selenium	mg/kg	2.6 = *	3.6 = *	1.3 J	1.6 J *
Silver	mg/kg	1.5 = *	0.63 U	0.2 U	0.19 U
Thallium	mg/kg	0.26 U	0.44 = *	NA	NA
Zinc	mg/kg	442 = *	248 = *	80.7 = *	200 = *

Table 4-23. Summary Data for Site-Related Inorganics in West Ditches Surface Soil at Load Line 3 [a] (continued)

Functional Area		West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate	West Ditches Aggregate
Station ID		LL3sd/sw-048(d)	LL3sd/sw-048(d)	LL3sd/sw-049(d)	LL3sd/sw-050(d)
Sample ID		LL31077	LL3SD-048(D)-0215-SD	LL3SD-049(D)-0216-SD	LL3SD-050(D)-0217-SD
Date		08/08/2001	07/27/1996	07/27/1996	07/27/1996
Depth (ft)		0 - 1	0 - 2	0 - 2	0 - 2
Sample Type		Grab	Grab Composite	Grab Composite	Grab Composite
Analyte	Units				
Inorganics					
Antimony	mg/kg	1.3 UJ	NA	NA	NA
Arsenic	mg/kg	14.2 =	15.1 J	18 J *	10.6 J
Barium	mg/kg	72.3 =	60.3 =	79.3 =	56.1 =
Beryllium	mg/kg	0.82 =	NA	NA	NA
Cadmium	mg/kg	0.69 = *	0.86 = *	0.51 J *	0.11 J *
Chromium	mg/kg	15.1 J	11.7 =	9.2 =	7.4 =
Cobalt	mg/kg	11.1 = *	NA	NA	NA
Copper	mg/kg	17.6 =	NA	NA	NA
Lead	mg/kg	31.1 = *	32.5 = *	24.1 =	17.5 =
Manganese	mg/kg	1,240 =	681 J	2,310 J *	587 J
Mercury	mg/kg	0.048 J *	0.03 U	0.04 U	0.03 U
Nickel	mg/kg	14.5 =	NA	NA	NA
Selenium	mg/kg	0.8 J	2.3 J *	1.8 J *	0.74 J
Silver	mg/kg	0.63 U	0.23 J *	0.2 U	0.2 U
Thallium	mg/kg	0.26 = *	NA	NA	NA
Zinc	mg/kg	179 = *	560 = *	117 = *	52.1 =

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
ID = Identification.
NA = Not analyzed.
* - Exceeds Ravenna Army Ammunition Plant background criteria.
= - Detected result.
J - Estimated result.
U - Not detected.

For the 16 metals retained as SRCs in surface soil, 6 were detected in 19 of 19 surface soil samples collected and 3 were detected in 16 of 16 surface soil samples collected. Of the metals identified as SRCs, cadmium, mercury, and zinc were detected at the highest frequency above background, while arsenic, manganese, selenium, and silver were detected at the lowest frequency (one detect each) above background. Table 4-24 provides a summary of all metals detected in the surface soil associated with the Perimeter Area Aggregate.

With the exception of antimony, sample station LL3-055 exhibited detectable concentrations of all metals analyzed. Barium, cadmium, chromium, copper, lead, mercury, silver, and zinc were all identified at this location with the highest concentrations identified in the Perimeter Area Aggregate surface soil. LL3-055 is located on the east side of Building EA-21 near the railroad track (Figure 4-6). The highest concentration of beryllium was identified at sample station LL3-056, located east of Building EA-5 near the railroad track.

4.2.5 SVOCs, VOCs, and PCBs

4.2.5.1 Preparation and Receiving Area Aggregate

SVOCs

A total of 16 SVOCs were detected in at least 1 of the 9 surface soil samples collected from the Preparation and Receiving Area Aggregate. Fourteen SVOC compounds were identified in the three samples collected from stations LL3-136, Ll3-138, and LL3-142. LL3-136 and LL3-138 are located along the borders of Building EB-3 and LL3-142 is located along the northeastern border of Building EB-803 (Figures 4-14, 4-15, and 4-16). All detected SVOC constituents were reported at concentrations less than 1 mg/kg. Table 4-25 provides a summary of detected SVOCs and Figures 4-14, 4-15, and 4-16 illustrate the distribution and concentration of analytes detected.

VOCs

A total of four VOCs were detected in at least one of the nine surface soil samples collected from the Preparation and Receiving Area Aggregate (Table 4-3). Toluene (0.0011 mg/kg) was detected as a single occurrence in the sample collected from station LL3-139 and acetone (0.066 mg/kg) and 2-butanone (0.0069 mg/kg) were detected in the sample collected from station LL3-140. Methylene chloride was identified in two surface soil samples collected during Phase I RI field effort.

Table 4-26 provides a summary of all VOCs detected and Figures 4-17 and 4-18 illustrate the sampling locations and detected concentrations of VOCs identified in the surface soil associated with the Preparation and Receiving Area Aggregate.

Pesticides and PCBs

Fifteen surface soils collected in either the Phase I or II RIs were analyzed for PCBs. Five of these samples were additionally analyzed for pesticides. Four pesticides [endrin aldehyde; heptachlor; 4,4'-dichlorodiphenyldichloroethylene (DDE); and 4,4'-dichlorodiphenyltrichloroethane (DDT)] and two PCB compounds (PCB-1254 and PCB-1260) were identified and retained as SRCs in the Preparation and Receiving Area Aggregate. Endrin aldehyde (0.01 mg/kg) and 4,4'-DDE (0.011 mg/kg) were detected in one sample collected from station LL3-136, which is located along the northern end of Building EB-3. 4,4'-DDT (0.021 mg/kg) was detected as a single occurrence in the sample collected from station LL3-142, which is located along the northeastern side of Building EB-308 (Figures 4-19, 4-20, and 4-21).

Table 4-24. Summary Data for Site-Related Inorganics in Perimeter Area Surface Soils at Load Line 3[a]

Functional Area		Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate
Station ID		**LL3-054**	**LL3-055**	**LL3-056**	**LL3-152**
Sample ID		**LL30684**	**LL30687**	**LL30690**	**LL30948**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/13/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	NA	2.4 = *	NA	NA
Antimony	mg/kg	1.1 UJ	1.2 UJ	1.1 UJ	1.1 UJ
Arsenic	mg/kg	12.4 =	7.5 =	7.8 =	9.4 =
Barium	mg/kg	105 J *	774 J *	88.4 J	79.8 =
Beryllium	mg/kg	0.97 = *	0.55 =	1.2 = *	0.53 =
Cadmium	mg/kg	7.5 = *	76.6 = *	0.54 = *	0.26 = *
Chromium	mg/kg	17.3 J	106 J *	6 J	15.6 J
Cobalt	mg/kg	4.8 =	6.5 =	3.6 =	8.3 =
Copper	mg/kg	13.7 J	55.3 J *	13.4 J	35.5 = *
Lead	mg/kg	67.2 J *	2,500 J *	36.6 J *	66.3 J *
Manganese	mg/kg	1,210 J	950 J	596 J	1,220 =
Mercury	mg/kg	0.012 J	0.1 J *	0.019 J	0.05 J *
Nickel	mg/kg	12.5 =	16.7 =	6.8 =	17.5 =
Selenium	mg/kg	0.47 J	0.64 J	0.52 J	2.3 U
Silver	mg/kg	0.54 U	0.4 J *	0.55 U	0.57 U
Thallium	mg/kg	0.33 J *	0.24 J *	0.22 J *	0.42 J *
Zinc	mg/kg	82.1 = *	1360 = *	61.9 = *	105 J *

Table 4-24. Summary Data for Site-Related Inorganics in Perimeter Area Surface Soils at Load Line 3 [a] (continued)

Functional Area		Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate
Station ID		**LL3-167**	**LL3-168**	**LL3-171**	**LL3-172**
Sample ID		**LL30993**	**LL30994**	**LL30997**	**LL30998**
Date		**08/11/2001**	**08/10/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	NA	NA	NA	NA
Antimony	mg/kg	1.2 UJ	1.1 UJ	5.4 J *	1.1 UJ
Arsenic	mg/kg	9.2 =	13.2 =	12.9 =	6.3 =
Barium	mg/kg	58.4 =	84.8 =	71.9 =	55.8 =
Beryllium	mg/kg	0.43 J	0.72 =	0.61 =	0.44 J
Cadmium	mg/kg	0.58 U	0.34 J *	0.16 J *	0.14 J *
Chromium	mg/kg	11.4 J	15.9 J	82.5 = *	7.8 =
Cobalt	mg/kg	7.8 =	11.4 J *	9.3 =	8.3 =
Copper	mg/kg	6.2 =	17.5 J	26.3 = *	6.1 =
Lead	mg/kg	19.8 J	19.9 =	362 = *	17.7 =
Manganese	mg/kg	514 =	841 =	286 =	657 =
Mercury	mg/kg	0.056 J *	0.056 J *	0.012 J	0.046 J *
Nickel	mg/kg	9.6 =	22.8 = *	24.4 = *	8.8 =
Selenium	mg/kg	0.65 J	2.3 U	2.4 U	2.2 U
Silver	mg/kg	0.58 U	0.57 U	0.59 U	0.54 U
Thallium	mg/kg	0.38 J *	0.26 U	0.42 UJ	0.39 UJ
Zinc	mg/kg	45.2 J	75.1 = *	67.4 = *	35.9 =

Table 4-24. Summary Data for Site-Related Inorganics in Perimeter Area Surface Soils at Load Line 3 [a] (continued)

Functional Area		Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate
Station ID		**LL3-173**	**LL3-173**	**LL3-174**	**LL3-176**
Sample ID		**LL30999**	**LL31132**	**LL31000**	**LL31002**
Date		**08/10/2001**	**08/10/2001**	**08/11/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Field Duplicate**	**Grab**	**Grab**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	NA	NA	NA	NA
Antimony	mg/kg	1.3 UJ	1.3 UJ	1.2 UJ	1.1 UJ
Arsenic	mg/kg	13.8 =	13.2 =	9.8 =	11.2 =
Barium	mg/kg	105 = *	93.3 = *	81 =	63 =
Beryllium	mg/kg	0.95 = *	0.91 = *	0.6 =	0.48 J
Cadmium	mg/kg	0.11 J *	0.63 U	0.21 J *	0.07 J *
Chromium	mg/kg	18.3 J *	16.6 J	12.2 J	14.2 J
Cobalt	mg/kg	14.7 = *	15.3 = *	7.4 J	6.4 =
Copper	mg/kg	13.9 =	12.1 =	7.6 J	9.4 =
Lead	mg/kg	26 J	25.2 J	23.3 =	17.9 J
Manganese	mg/kg	1,910 = *	1,900 = *	952 =	789 =
Mercury	mg/kg	0.069 J *	0.066 J *	0.075 J *	0.052 J *
Nickel	mg/kg	18.8 =	16.8 =	10.3 =	10.8 =
Selenium	mg/kg	2.5 U	2.5 U	2.3 U	2.3 U
Silver	mg/kg	0.63 U	0.63 U	0.58 U	0.57 U
Thallium	mg/kg	0.38 J *	0.35 J *	0.28 UJ	0.33 J *
Zinc	mg/kg	70.5 J *	61.8 J	51.2 =	43.9 J

Table 4-24. Summary Data for Site-Related Inorganics in Perimeter Area Surface Soils at Load Line 3 [a] (continued)

Functional Area		Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate
Station ID		**LL3-177**	**LL3-178**	**LL3-179**	**LL3-180**
Sample ID		**LL31003**	**LL31004**	**LL31005**	**LL31006**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/10/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	0.56 U	NA	NA	NA
Antimony	mg/kg	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ
Arsenic	mg/kg	9.6 =	12 =	9.2 =	7.3 =
Barium	mg/kg	70.5 =	63 J	69.5 =	53.3 =
Beryllium	mg/kg	0.52 J	0.48 =	0.49 =	0.38 U
Cadmium	mg/kg	0.29 J *	0.16 = *	0.59 U	0.58 U
Chromium	mg/kg	10.7 J	24.6 J *	13.5 J	12.4 J
Cobalt	mg/kg	8.6 J	7.8 =	6.8 =	4 =
Copper	mg/kg	8.6 J	14.6 J	8.5 =	8 =
Lead	mg/kg	20.1 =	16.5 J	16.7 J	19.1 J
Manganese	mg/kg	1,020 =	301 J	549 =	127 =
Mercury	mg/kg	0.026 J	0.033 J	0.04 J *	0.063 J *
Nickel	mg/kg	9.9 =	17.3 =	9.9 =	8.5 =
Selenium	mg/kg	2.2 U	0.4 J	0.45 J	2.3 U
Silver	mg/kg	0.56 U	0.59 U	0.59 U	0.58 U
Thallium	mg/kg	0.43 UJ	0.26 J *	0.27 J *	0.29 J *
Zinc	mg/kg	45 =	48.1 =	45.9 J	49.8 J

Table 4-24. Summary Data for Site-Related Inorganics in Perimeter Area Surface Soils at Load Line 3 [a] (continued)

Functional Area		Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate	Perimeter Area Aggregate
Station ID		**LL3-181**	**LL3ss-038(b)**	**LL3ss-039(b)**	**LL3ss-040(b)**
Sample ID		**LL31007**	**LL3SS-038(B)-0205-SO**	**LL3SS-039(B)-0206-SO**	**LL3SS-040(B)-0207-SO**
Date		**08/10/2001**	**07/27/1996**	**07/26/1996**	**07/26/1996**
Depth (ft)		**0 - 1**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**				
Inorganics					
Cyanide	mg/kg	NA	NA	NA	NA
Antimony	mg/kg	1.3 J *	NA	NA	NA
Arsenic	mg/kg	10.9 =	16.8 J *	12 =	9.4 =
Barium	mg/kg	56.3 J	75 =	45.5 =	58.4 =
Beryllium	mg/kg	0.5 =	NA	NA	NA
Cadmium	mg/kg	0.58 U	0.05 U	0.04 U	0.04 U
Chromium	mg/kg	13.3 J	17.8 = *	12 =	11 =
Cobalt	mg/kg	8.7 =	NA	NA	NA
Copper	mg/kg	9.9 J	NA	NA	NA
Lead	mg/kg	20.4 J	17.9 =	13.7 =	14.7 =
Manganese	mg/kg	586 J	148 J	179 =	664 =
Mercury	mg/kg	0.064 J *	0.04 U	0.04 U	0.04 U
Nickel	mg/kg	12.3 =	NA	NA	NA
Selenium	mg/kg	2.3 U	1.9 J *	1.4 =	1.4 =
Silver	mg/kg	0.58 U	0.22 U	0.2 U	0.21 U
Thallium	mg/kg	0.24 J *	NA	NA	NA
Zinc	mg/kg	48 =	55.3 =	44.1 =	40.5 =

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
ID = Identification.
NA = Not analyzed.
* - Exceeds Ravenna Army Ammunition Plant background criteria.
= - Detected result.
J - Estimated result.
U - Not detected.

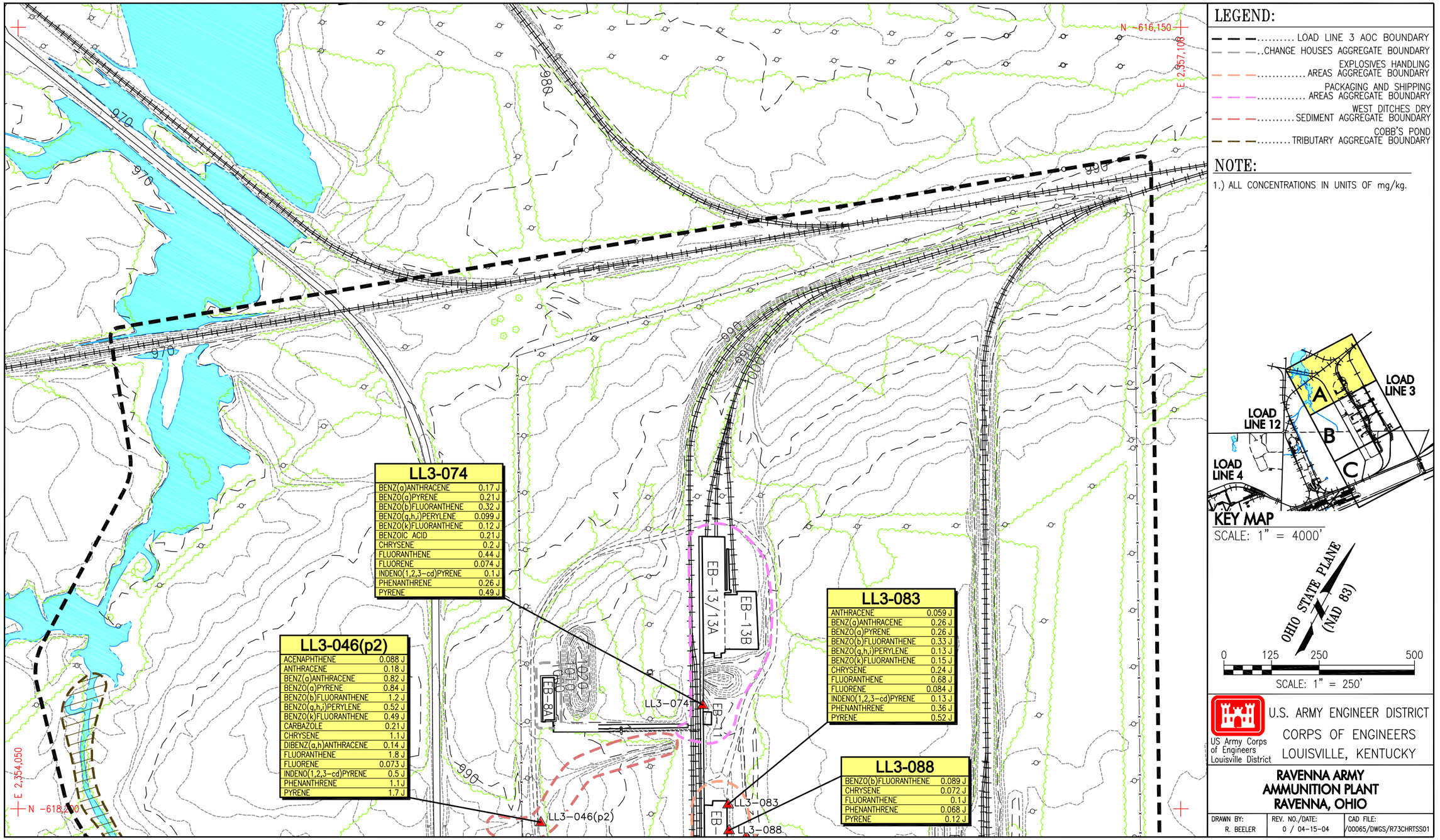


Figure 4-14. Distribution of Detected Total SVOCs in Surface Soil at Load Line 3 - Northern Section

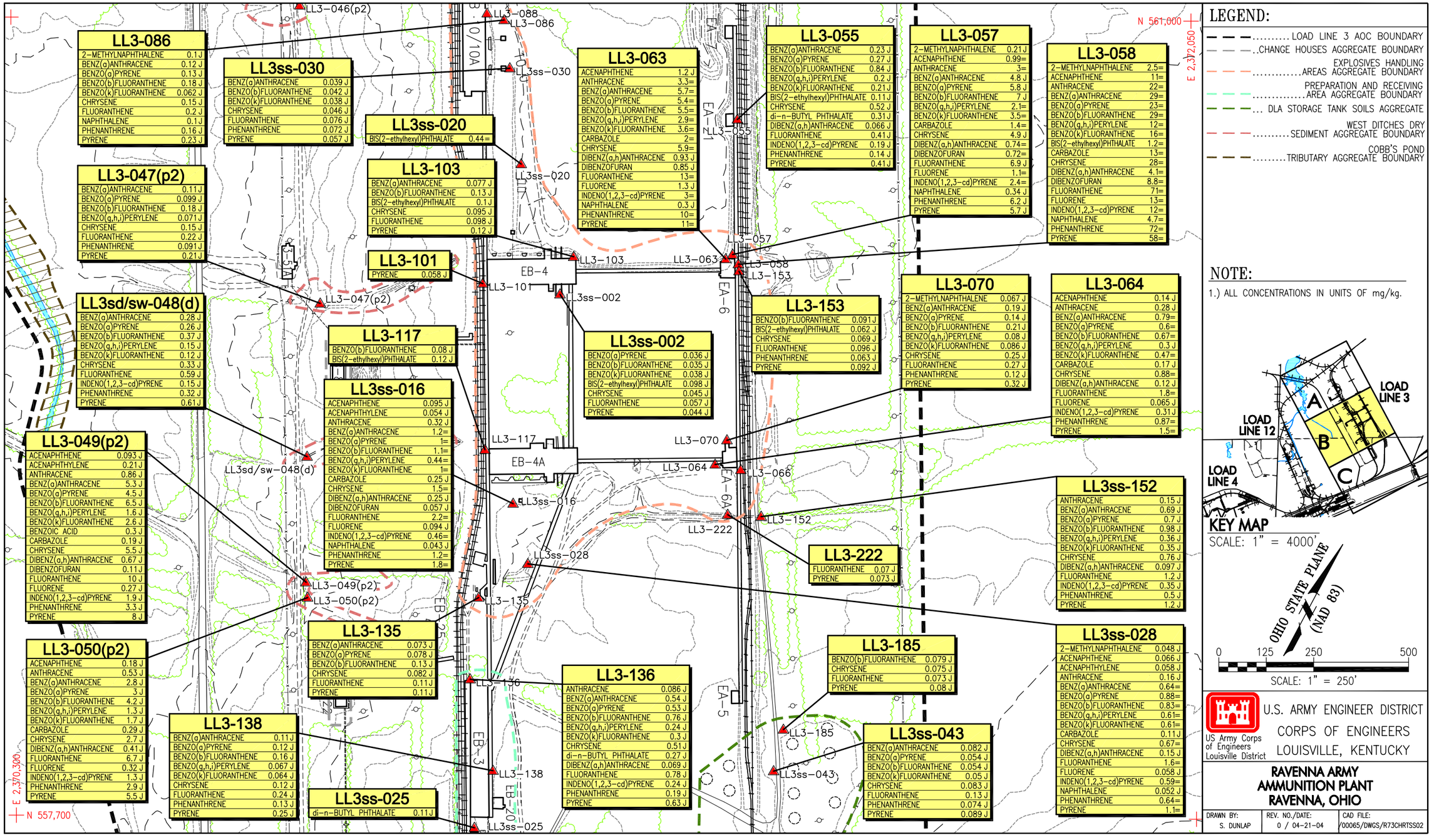


Figure 4-15. Distribution of Detected Total SVOCs in Surface Soil at Load Line 3 - Central Section

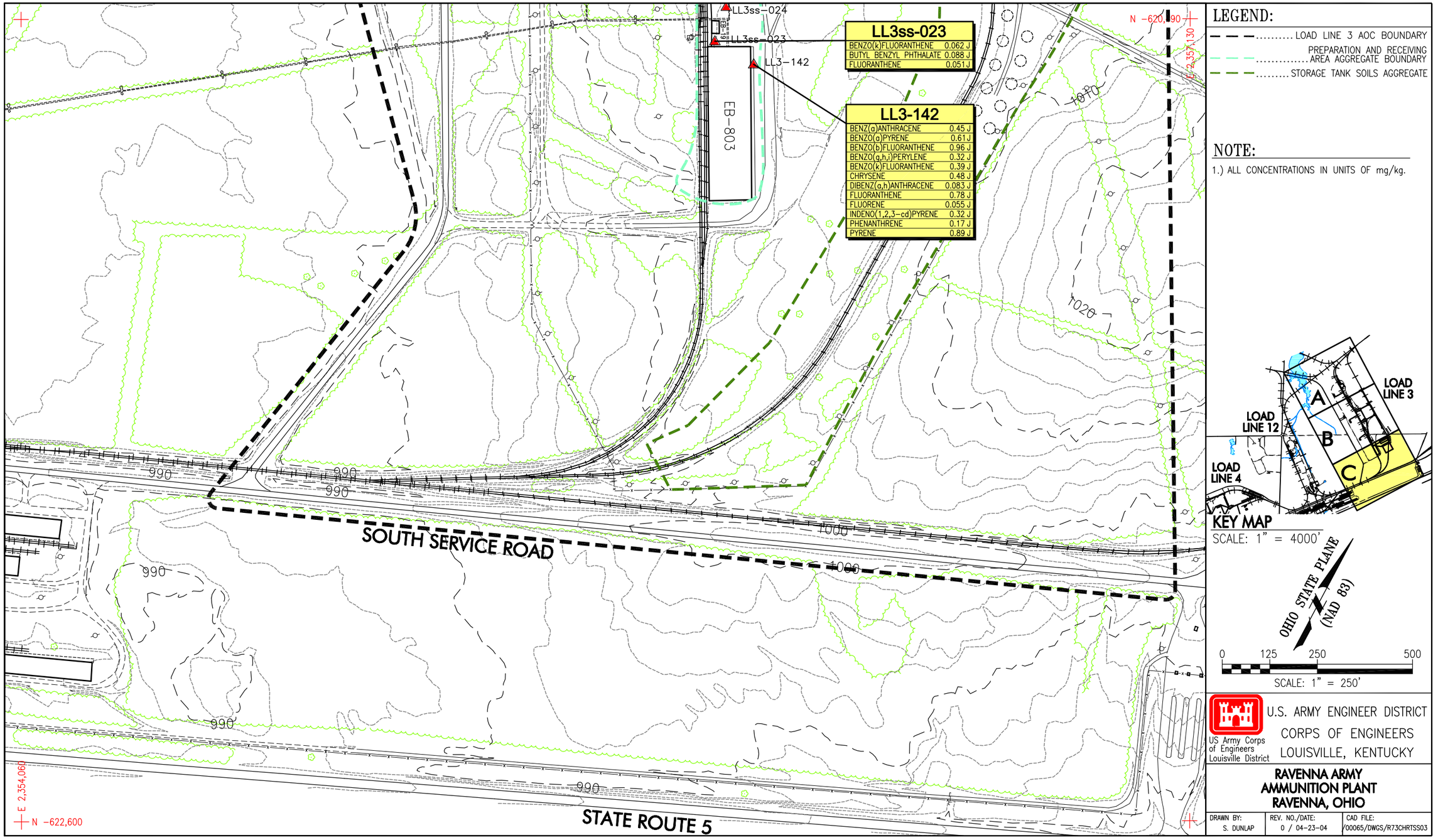


Figure 4-16. Distribution of Detected Total SVOCs in Surface Soil at Load Line 3 - Southern Section

Table 4-25. Summary Data for Site-Related Semivolatiles in Preparation and Receiving Areas Aggregate Surface Soils at Load Line 3 [a]

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-080**	**LL3-136**	**LL3-138**	**LL3-139**	**LL3-140**
Sample ID		**LL30754**	**LL30902**	**LL30908**	**LL30911**	**LL30914**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/11/2001**	**08/11/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**					
Semivolatile Organics						
Anthracene	mg/kg	0.38 UJ	0.086 J	0.38 UJ	0.39 UJ	0.39 UJ
Benzo(*a*)anthracene	mg/kg	0.38 UJ	0.54 J	0.11 J	0.39 UJ	0.39 UJ
Benzo(*a*)pyrene	mg/kg	0.38 UJ	0.53 J	0.12 J	0.39 UJ	0.39 UJ
Benzo(*b*)fluoranthene	mg/kg	0.38 UJ	0.76 J	0.16 J	0.39 UJ	0.39 UJ
Benzo(*g,h,i*)perylene	mg/kg	0.38 UJ	0.24 J	0.067 J	0.39 UJ	0.39 UJ
Benzo(*k*)fluoranthene	mg/kg	0.38 UJ	0.3 J	0.064 J	0.39 UJ	0.39 UJ
Bis(2-ethylhexyl)phthalate	mg/kg	0.38 UJ	0.39 UJ	0.38 UJ	0.39 UJ	0.39 UJ
Butyl benzyl phthalate	mg/kg	0.38 UJ	0.39 UJ	0.38 UJ	0.39 UJ	0.39 UJ
Chrysene	mg/kg	0.38 UJ	0.51 J	0.12 J	0.39 UJ	0.39 UJ
Di-n-butyl phthalate	mg/kg	0.38 UJ	0.27 J	0.38 UJ	0.39 UJ	0.39 UJ
Dibenzo(*a,h*)anthracene	mg/kg	0.38 UJ	0.069 J	0.38 UJ	0.39 UJ	0.39 UJ
Fluoranthene	mg/kg	0.38 UJ	0.78 J	0.24 J	0.39 UJ	0.39 UJ
Fluorene	mg/kg	0.38 UJ	0.39 UJ	0.38 UJ	0.39 UJ	0.39 UJ
Indeno(1,2,3-*cd*)pyrene	mg/kg	0.38 UJ	0.24 J	0.38 UJ	0.39 UJ	0.39 UJ
Phenanthrene	mg/kg	0.38 UJ	0.19 J	0.13 J	0.39 UJ	0.39 UJ
Pyrene	mg/kg	0.38 UJ	0.63 J	0.25 J	0.39 UJ	0.39 UJ

Table 4-25. Summary Data for Site-Related Semivolatiles in Preparation and Receiving Areas Aggregate Surface Soils at Load Line 3 [a] (continued)

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-142**	**LL3-142**	**LL3ss-023**	**LL3ss-024**	**LL3ss-025**
Sample ID		**LL30918**	**LL31120**	**LL3SS-023-0187-SO**	**LL3SS-024-0188-SO**	**LL3SS-025-0189-SO**
Date		**08/09/2001**	**08/09/2001**	**07/23/1996**	**07/23/1996**	**07/23/1996**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Grab**	**Field Duplicate**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**					
Semivolatile Organics						
Anthracene	mg/kg	0.35 UJ	0.35 UJ	0.38 U	0.36 U	0.35 U
Benzo(*a*)anthracene	mg/kg	0.45 J	0.19 J	0.38 U	0.36 U	0.35 U
Benzo(*a*)pyrene	mg/kg	0.61 J	0.25 J	0.38 U	0.36 U	0.35 U
Benzo(*b*)fluoranthene	mg/kg	0.96 J	0.48 J	0.38 U	0.36 U	0.35 U
Benzo(*g,h,i*)perylene	mg/kg	0.32 J	0.19 J	0.38 U	0.36 U	0.35 U
Benzo(*k*)fluoranthene	mg/kg	0.39 J	0.15 J	0.062 J	0.36 U	0.35 U
Bis(2-ethylhexyl)phthalate	mg/kg	0.35 UJ	0.35 UJ	0.38 U	0.24 J	0.35 U
Butyl benzyl phthalate	mg/kg	0.35 UJ	0.35 UJ	0.088 J	0.36 U	0.35 U
Chrysene	mg/kg	0.48 J	0.23 J	0.38 U	0.36 U	0.35 U
Di-n-butyl phthalate	mg/kg	0.35 UJ	0.35 UJ	0.38 U	0.36 U	0.11 J
Dibenzo(*a,h*)anthracene	mg/kg	0.083 J	0.35 UJ	0.38 U	0.36 U	0.35 U
Fluoranthene	mg/kg	0.78 J	0.36 J	0.051 J	0.36 U	0.35 U
Fluorene	mg/kg	0.055 J	0.35 UJ	0.38 U	0.36 U	0.35 U
Indeno(1,2,3-*cd*)pyrene	mg/kg	0.32 J	0.18 J	0.38 U	0.36 U	0.35 U
Phenanthrene	mg/kg	0.17 J	0.11 J	0.38 U	0.36 U	0.35 U
Pyrene	mg/kg	0.89 J	0.43 J	0.38 U	0.36 U	0.35 U

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
ID = Identification.
= - Detected result.
J - Estimated result.
U - Not detected.

Table 4-26. Summary Data for Site-Related VOCs in Preparation and Receiving Areas Aggregate Surface Soil at Load Line 3 [a]

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-080**	**LL3-137**	**LL3-138**	**LL3-139**	**LL3-140**	**LL3-142**
Sample ID		**LL30754**	**LL30905**	**LL30908**	**LL30911**	**LL30914**	**LL30918**
Date		**08/10/2001**	**08/10/2001**	**08/10/2001**	**08/11/2001**	**08/11/2001**	**08/09/2001**
Depth (ft)		**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
Sample Type		**Grab**	**Grab**	**Grab**	**Grab**	**Grab**	**Grab**
Analyte	**Units**						
Volatile Organics							
2-Butanone	mg/kg	0.023 UJ	0.024 UJ	0.023 U	0.023 UJ	0.0069 J	0.021 U
Acetone	mg/kg	0.023 UJ	0.024 UJ	0.023 UJ	0.0033 J	0.066 J	0.021 UJ
Methylene Chloride	mg/kg	0.0057 U	0.006 U	0.0057 U	0.0059 U	0.006 U	0.0053 U
Toluene	mg/kg	0.0057 U	0.0014 J	0.0057 U	0.0011 J	0.006 U	0.0053 U

Table 4-26. Summary Data for Site-Related VOCs in Preparation and Receiving Areas Aggregate Surface Soil at Load Line 3 [a] (continued)

Functional Area		Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate	Preparation and Receiving Areas Aggregate
Station ID		**LL3-142**	**LL3ss-023**	**LL3ss-024**	**LL3ss-025**
Sample ID		**LL31120**	**LL3SS-023-0187-SO**	**LL3SS-024-0188-SO**	**LL3SS-025-0189-SO**
Date		**08/09/2001**	**07/23/1996**	**07/23/1996**	**07/23/1996**
Depth (ft)		**0 - 1**	**0 - 2**	**0 - 2**	**0 - 2**
Sample Type		**Field Duplicate**	**Grab Composite**	**Grab Composite**	**Grab Composite**
Analyte	**Units**				
Volatile Organics					
2-Butanone	mg/kg	0.021 U	0.006 UJ	0.005 U	0.005 UJ
Acetone	mg/kg	0.021 UJ	0.006 UJ	0.005 U	0.005 UJ
Methylene Chloride	mg/kg	0.0053 U	0.002 J	0.021 U	0.004 J
Toluene	mg/kg	0.0053 U	0.006 UJ	0.005 U	0.005 UJ

[a] Table presents both Phase I RI (1996 collection date) and Phase II RI (2001 collection date).
ID = Identification.
VOC = Volatile organic compound.
J - Estimated result.
U - Not detected.