6. SWMU 11 – CHEMICAL MUNITIONS STORAGE AREA

This section presents the results of the Phase I and II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) conducted at solid waste management unit (SWMU) 11 – Chemical Munitions Storage Area. The site geologic and hydrologic features are presented and are followed by the Phase I and II investigation methodology, results, and nature and extent of identified contamination. The results of the assessment of human health and ecological risks associated with the chemicals of potential concern (COPCs) also are presented.

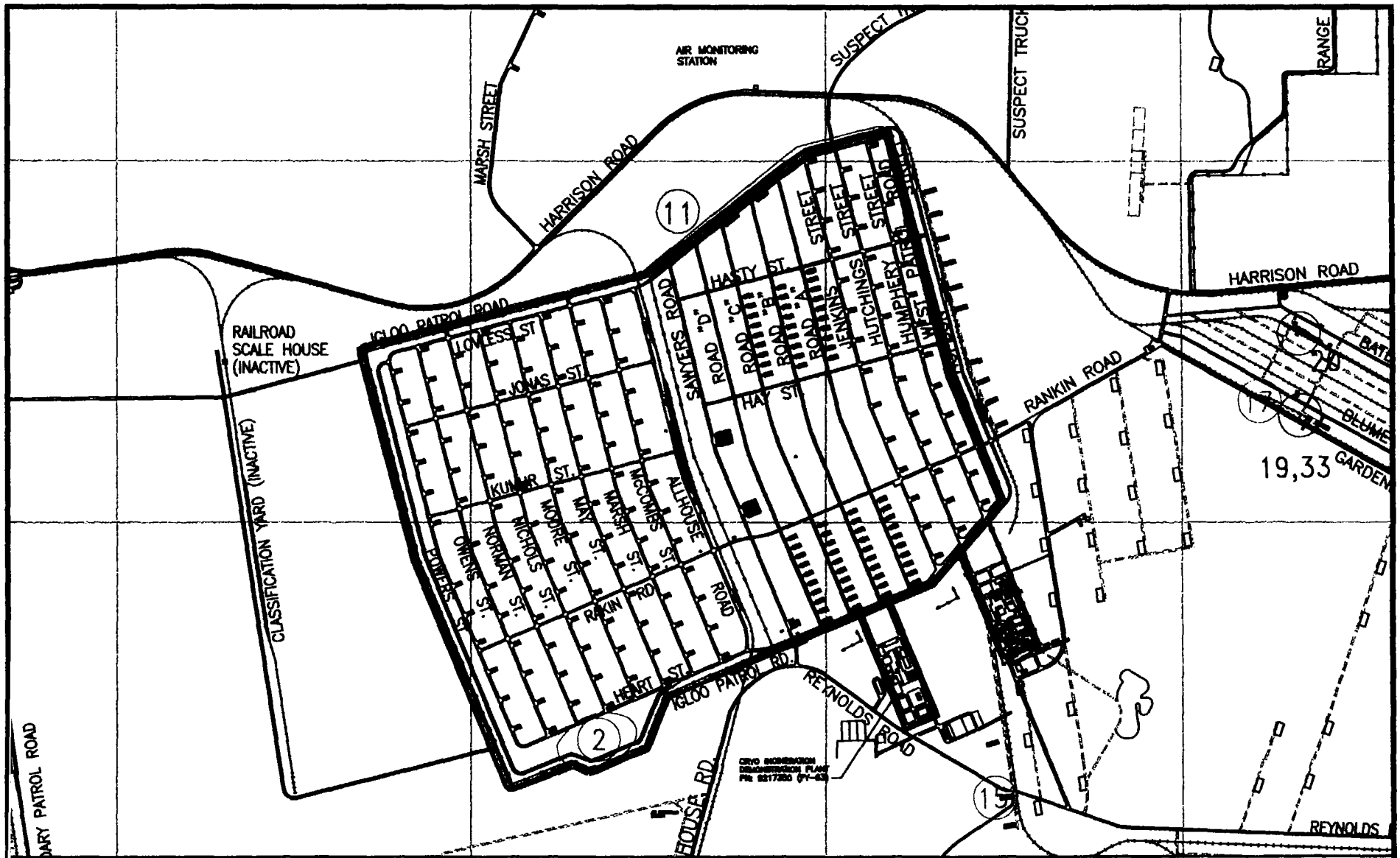
6.1 SWMU 11 DESCRIPTION/CURRENT SITE CONDITIONS

SWMU 11 – Chemical Munitions Storage Area is located within a highly secured portion of the northwest section of Deseret Chemical Depot (DCD). This area has been in operation since the mid-1940s and has stored various chemical agent munitions and materials, including mustard (H, HD, and HT), Lewisite (L), Sarin (GB), Tabun (GA), nerve gas (VX), phosgene (CG), o-chlorobenzylidene malononitrile (CS), cyanogen chloride (CK), smoke agent (FS and HC), white phosphorus (WP), thermite, and napalm. Currently, mustard, Lewisite, Sarin, and VX are stored in this area. These materials and various other nonhazardous materials are stored under Army control in several different types of storage areas (e.g., open storage areas, concrete igloos, and steel arch igloos) pending their disposal. The total area of SWMU 11 is approximately 640 acres (see Figure 6-1).

Hazardous materials stored at SWMU 11 are maintained in the reinforced concrete storage igloos, which are designed and closely monitored to minimize the potential for release. The igloos have sloped, concrete floors that drain toward a catchment basin. Each igloo is a closed system and any liquids released are collected in plastic drums inside the catchment basins.

A former disposal area identified as SWMU 2 is located within the physical boundaries of SWMU 11. SWMU 2 is located in the southwestern portion of SWMU 11 and covers 5.8 acres. SWMU 2 contains a gravel pit (an oval area approximately 150 feet long) used for munitions burial. The only documentation of the pit contents is an employee deposition (dated April 1, 1959) referenced in the Installation Assessment (USATHAMA 1979). Nondemilitarized munitions potentially buried at the site include M-2 ignition cartridges, squibs, hand grenades, blasting caps, M-21 incendiary bomb clusters, mustard, smoke pots, 2,4,6-trinitrotoluene (TNT) blocks, M-71 incendiary bombs, bottled FS smoke, and M-19 incendiary bombs. According to installation personnel, the munitions were covered with approximately 7 feet of soil (NUS 1987).

Due to the close proximity of SWMU 2, its contents could migrate into SWMU 11 through surface runoff and/or migration into the groundwater. During the Group 3 Phase II activities, no samples were collected at SWMU 2, which is not included in the evaluation of SWMU 11. Due to safety concerns, no investigation of SWMU 2 is recommended until all weapons stored within SWMU 11 are removed and the closure of SWMU 11 is completed.



LEGEND:

- (11) ..... SAIC PHASE II SWMU
- (2) ..... SWMU
- ═══ ..... ROADS AND PARKING
- = = = = = ... ROADS AND STRUCTURES ABANDONED IN PLACE
- +++++ ..... RAILROAD

NOTES:

1.) BASE MAP INFO. WAS SCANNED AND IS ACCURATE TO 1:1000.

N

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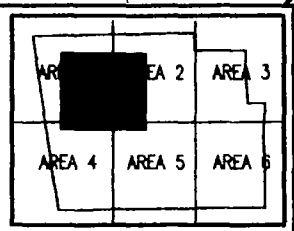
SCALE: 1" = 2000'



KEY MAP

SCALE: 1"=30,000'

Deseret Chemical Depot
Tooele, Utah

SWMU 11 – CHEMICAL MUNITIONS STORAGE AREA

Figure:	Project:	File:	Date:
6-1	01-0827-03-6523-042	7109/RFI11CMS	NOV. 2000

6.2 SWMU 11 SPECIFIC GEOLOGY AND HYDROGEOLOGY

SWMU 11 is located on a south-west sloping topographic area that is underlain by Quaternary age alluvial deposits. During the 1994-95 Phase II investigation, near-surface soils at the SWMU were characterized using samples collected from 20 shallow borings drilled to 3 feet below land surface (BLS) . These near-surface soils are composed of loose, pale brown to brown silty sands containing varying quantities of fine- to coarse-grained sand, and occasional gravels. In many cases, these upper soils consisted of fill material composed of soil types native to the DCD area. The majority of these soils had been placed in the SWMU area as part of regrading activities for road construction and maintenance of surficial drainage swales. Periodic seasonal precipitation produces runoff in the SWMU area such that a comprehensive drainage system of surficial swales has been constructed to facilitate the flow and discharge of water from the area. Although a large percentage of the water infiltrates into the local lithology, excess runoff accumulates in the outflow discharge ditches immediately outside the fenced area on the western border of the SWMU.

As part of the 1994-95 Phase II activities at SWMU 11, investigation of the subsurface lithology at SWMU 11 was limited to the near-surface soils. However, the local subsurface lithology was characterized during Phase I activities. These activities included installing five monitoring wells (S-3, S-45-90, S-46-90, S-74-90, and S-75-90) downgradient from SWMU 11 (EBASCO 1993a). The soil borings associated with the wells indicated that the local unsaturated zone is approximately 10 to 20 feet thick and is composed of loose to stiff, light gray to grayish-brown, silty sands and gravels (EBASCO 1993a). The saturated zone, from approximately 15 to 25 feet BLS, is composed of dense, pale yellow to dark brown sandy gravels. Table 6-1 shows the screened interval and static water elevations recorded in January 2000 for the Phase I monitoring wells in the vicinity of SWMU 11. Table 6-2 presents the groundwater elevation data recorded during various times from September 1994 through January 2000.

Table 6-1. SWMU 11 Monitoring Well Construction Data
Deseret Chemical Depot, Tooele, Utah

Well ID	Screened Interval Depth (feet BLS)	Screened Interval Elevation (feet above msl)	Groundwater Depth – Jan. 2000 (feet BLS)	Groundwater Elevation – Jan. 2000 (feet above msl)
S-3	24 to 44	5,027 to 5,007	23.69	5,029.94
S-45-90	21 to 31	5,027 to 5,017	15.00	5,034.32
S-46-90	15 to 25	5,031 to 5,021	18.50	5,029.74
S-74-90	19 to 29	5,032 to 5,022	22.45	5,030.09
S-75-90	15 to 25	5,032 to 5,022	19.63	5,029.99

Note: Groundwater in this area has been identified to flow in a west-southwest direction. All five of these wells are located in this general downgradient direction from SWMU 11.

Table 6-2. SWMU 11 Groundwater Elevation Data
Deseret Chemical Depot, Tooele, Utah

Site ID	Measurement Date	Elevation TOC (msl; ft)	Water Level (BTOC; ft)	Water Level (msl; ft)	Northing	Easting
S-45-90	09/25/94	5049.32	19.15	5030.17	722103	1755904
	12/12/94	5049.32	19.35	5029.97		
	04/23/98	5049.32	13.93	5035.39		
	05/20/98	5049.32	13.98	5035.34		
	11/13/98	5049.32	14.55	5034.77		
	02/17/99	5049.32	14.41	5034.91		
	05/05/99	5049.32	14.28	5035.04		
	01/27/00	5049.32	15.00	5034.32		
S-46-90	09/25/94	5048.24	20.75	5027.49	716853	1755631
	12/12/94	5048.24	50.56	4997.68		
	04/23/98	5048.24	17.25	5030.99		
	05/20/98	5048.24	17.18	5031.06		
	11/13/98	5048.24	18.38	5029.86		
	02/17/99	5048.24	18.08	5030.16		
	05/05/99	5048.24	17.80	5030.44		
	01/27/00	5048.24	18.50	5029.74		
S-74-90	09/25/94	5052.54	25.10	5027.44	720481	1755904
	12/12/94	5052.54	24.72	5027.82		
	04/23/98	5052.54	21.08	5031.46		
	05/20/98	5052.54	21.16	5031.38		
	11/13/98	5052.54	22.43	5030.11		
	02/17/99	5052.54	22.03	5030.51		
	05/05/99	5052.54	21.70	5030.84		
	01/27/00	5052.54	22.45	5030.09		
S-75-90	09/25/94	5049.62	22.20	5027.42	718677	1754869
	12/12/94	5049.62	21.76	5027.86		
	04/23/98	5049.62	18.29	5031.33		
	05/20/98	5049.62	18.38	5031.24		
	11/13/98	5049.62	19.65	5029.97		
	02/17/99	5049.62	19.25	5030.37		
	05/05/99	5049.62	18.88	5030.74		
	01/27/00	5049.62	19.63	5029.99		
S-3	09/25/94	5053.63	25.78	5027.85	716593	1756679
	12/12/94	5053.63	25.68	5027.95		
	04/23/98	5053.63	22.55	5031.08		
	05/20/98	5053.63	22.37	5031.26		
	11/13/98	5053.63	23.43	5030.20		
	02/17/99	5053.63	23.24	5030.39		
	05/05/99	5053.63	23.00	5030.63		
	01/27/00	5053.63	23.69	5029.94		

BTOC – Below Top of Casing
TOC – Top of Casing
msl – Mean Sea Level
NR – Not Recorded

The Phase I RFI indicated that the groundwater table in the vicinity of SWMU 11 has a relatively small gradient, resulting in slow groundwater flow that may vary in direction. The Phase II water level measurements presented in Table 6-2 confirm this observation and indicate that the groundwater flow direction generally trends to the south/southwest.

6.3 SWMU 11 PREVIOUS INVESTIGATION RESULTS

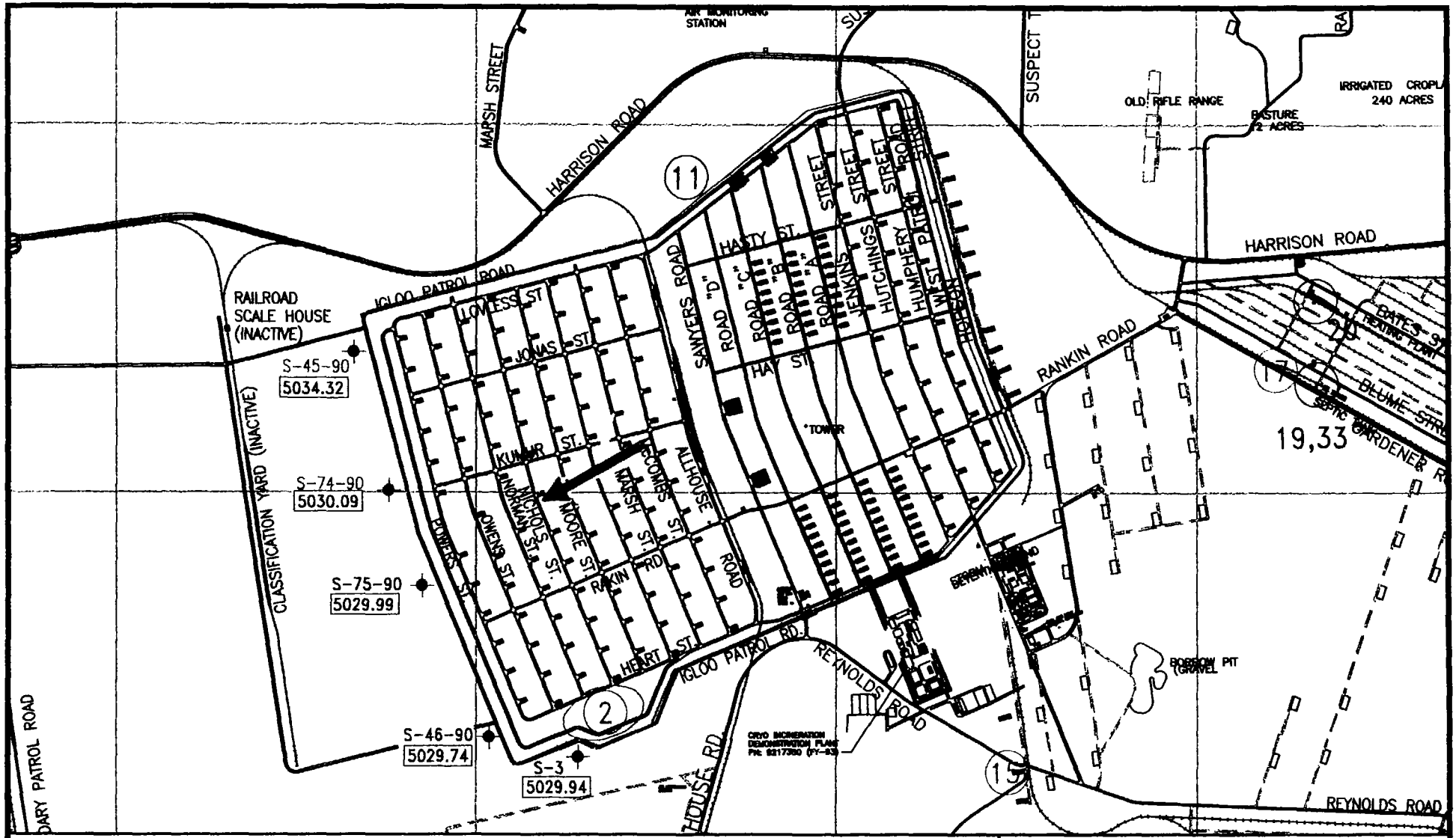
Prior to the Phase I RFI activities at SWMU 11, ERTEC (1982) installed and collected groundwater samples at monitoring well S-3 and collected one sediment sample along the western boundary of SWMU 11 (see Figure 6-2). During the Phase I RFI field program conducted by EBASCO, four additional monitoring wells (S-45-90, S-46-90, S-74-90, and S-75-90) were installed southwest and downgradient from SWMU 11, and groundwater samples were collected from each well. Based on data collected in January 2000, the groundwater table in the vicinity of SWMU 11 ranged from approximately 15 to 24 feet BLS and generally flows to the west-southwest. Table 6-3 summarizes the previous investigation activities and results.

During pre-Phase I sampling, inorganic analytes were detected in the sediment sample (SD-3) collected near the western boundary of SWMU 11. Chloride was detected at an elevated concentration in downgradient well S-46-90. Sodium, a nontarget analyte, was the only inorganic detected in the wells above background concentrations established during the Phase I RFI. The sodium concentration is not attributable to known historical activities at SWMU 11 (EBASCO 1993a).

During the Phase I RFI, volatile organic compounds (VOCs) were detected in samples from monitoring wells S-3 and S-46-90. The VOCs detected consisted of methylene chloride, chloroform, and 1,1-dichloroethane (1,1-DCA). The methylene chloride likely is associated with laboratory contamination; the other two chlorinated solvents detected in the wells are not clearly linked to historical activities at SWMU 2 or SWMU 11 (EBASCO 1993a).

Petroleum hydrocarbons, TNT, and isopropylmethyl phosphonic acid (IMPA), which were detected during Pre-Phase I sampling at monitoring well S-3, were not detected during the Phase I RFI. Based on the operational history of the site (chemical and explosive munitions storage), the occurrence of petroleum hydrocarbons in the groundwater is unlikely to be related to historical activities at SWMU 2 or SWMU 11 and is not believed to be related to a contaminant release attributed to these SWMUs. However, the presence of TNT could be related to a release from SWMU 2. Additional information regarding SWMU 2 is presented in the Phase I RFI Report (EBASCO 1993a). Previous detections of IMPA at well S-3 is suspect because those detections were qualified as noncertified results (EBASCO 1993a).

Chemical agent releases have not occurred within the igloos at SWMU 11. However, in September 1993, a spill/leak was identified during a routine surveillance inspection of the outdoor HD storage yard centrally located within SWMU 11. The outdoor HD storage yard contains cylindrical steel HD containers that are 30.5 inches in diameter and 81.5 inches long and are stored on steel rail container beds that support 15 containers. The containers are secured to the beds with steel wire rope (TEAD 1993c).



LEGEND:

- ROADS & PARKING
- ROADS AND STRUCTURES ABANDONED IN PLACE
- RAILROAD
- (11) SAIC PHASE II SWMU
- (2) SWMU
- MONITORING WELL
- 5029.99 GROUNDWATER ELEVATION IN FEET MSL
- GENERAL GROUNDWATER FLOW DIRECTION (JANUARY 2000)

NOTES:

1.) BASE MAP INFO. WAS SCANNED & IS ACCURATE TO 1:1000.

2.) WELL MEASUREMENTS COLLECTED ON JANUARY 27, 2000.

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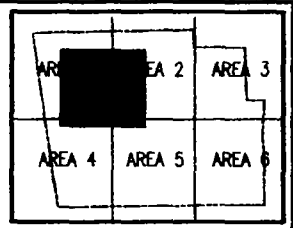
SCALE: 1" = 2000'



KEY MAP
NOT TO SCALE

Deseret Chemical Depot
Tooele, Utah

SWMU 11 – GROUNDWATER ELEVATIONS JANUARY 2000

Figure:	Project:	File:	Date:
6-2	01-0827-03-6523-042	7109/RFI11GCA	NOV. 2000

Table 6-3. SWMU 11 Previous Investigation Activities and Results
Deseret Chemical Depot, Tooele, Utah

Phase	Previous Activity	Result
Pre-Phase I (ERTEC 1982)	• Installed/sampled monitoring well S-3; analyzed samples for VOCs, SVOCs, agent breakdown products, explosives, metals, radionuclides, and petroleum hydrocarbons.	• COPCs: Agent breakdown products and petroleum hydrocarbons were detected.
	• Collected sediment sample along western boundary (S-SD3); analyzed sample for explosives, metals, anions, and radionuclides.	• COPCs: No COPCs were detected in sediment sample S-SD3; however, inorganic analytes were detected in the sample.
Phase I (EBASCO 1993a)	• Installed monitoring wells S-45-90, S-46-90, S-74-90, and S-75-90 southwest and downgradient from SWMU 11; analyzed samples from all wells for VOCs, SVOCs, agent breakdown products, explosives, and metals.	• COPCs: VOCs were detected in monitoring wells S-3 and S-46-90.
N/A (1993)	• Spill/leak of approximately 78 gallons of HD.	• No offpost release. • Excavation/containerization of all contaminated soils.

During a September 1993 visual surveillance conducted by DCD, black soil covering an area approximately 10 by 12 feet was identified on the ground surface directly below a valve on a 1-ton HD container. DCD estimated that approximately 78 gallons of HD had leaked from the container. No off-post release occurred, and HD was not detected by downwind HD detection devices prior to or after identification of the spill. Emergency spill response measures enacted by DCD included covering the spill area with plastic to prevent volatilization, covering the spill area with a decontamination solution of chlorine bleach, and notifying the national and local authorities and the surrounding community of the event (TEAD 1993c).

Following the immediate containment and control of the spill, DCD initiated excavation activities to remove the contaminated soil. During the excavation, soil samples were collected from the bottom of the excavation pit and analyzed in an onsite laboratory for HD to ensure that all of the contaminated soil had been removed. DCD conducted analysis according to Army specifications for detecting HD in soil. Four soil sampling episodes, totaling 93 samples, were conducted as part of the removal process. Each subsequent excavation and sampling episode further defined the areal and vertical extent of contamination. Excavation and sampling activities continued until HD was not detected in samples collected from the bottom of the excavation area. All contaminated soil was drummed and staged at a permitted hazardous waste storage igloo within SWMU 11. The soil removal and sampling process lasted approximately 6 weeks, with the final excavation pit covering an area approximately 25 by 16 feet and 4 feet deep. The soil currently is stored at SWMU 11 in a permitted storage igloo (TEAD 1993c).

6.4 SWMU 11 PHASE II RFI FIELD INVESTIGATION APPROACH

The Phase II activities at SWMU 11 were conducted to determine whether soil contamination is present, if contamination has migrated into the groundwater, and if contamination is migrating offsite. Activities to accomplish these objectives included conducting an explosive risk survey, collecting soil samples within and immediately adjacent to SWMU 11, and collecting groundwater samples at five existing downgradient monitoring wells along the western boundary of SWMU 11.

Phase II field activities at SWMU 11 were conducted in 1994-95 (Phase II) and 1998 (Phase IIA). During the 1994-95 Phase II field activities, 20 surface soil samples and 20 subsurface soils were collected and 2 rounds of groundwater samples were collected at the 5 existing wells. All samples were analyzed for metals, cyanide, VOCs, agent breakdown products, semivolatile organic compounds (SVOCs), explosives, and polychlorinated biphenyls (PCBs). Additional groundwater sampling was conducted during the 1998 Phase IIA activities because of inconsistent results between the Phase I (1990-92) and Phase II (1994-95) sampling events. The Phase II planned activities, any deviations, and the rationale for these deviations are presented in Table 6-4. Appendix N presents representative photographs of Phase II field investigation activities.

6.5 SWMU 11 PHASE II RFI RESULTS

The following sections present the results of the Phase II RFI activities conducted at SWMU 11. Discussions on the explosive risk evaluation, sampling results, and nature and extent of contamination are included.

6.5.1 SWMU 11 Explosive Risk Evaluation

Prior to any intrusive activities, an unexploded ordnance (UXO) evaluation was conducted that included a review of historical records and a visual surface inspection of the SWMU area. The review of the site history and past storage practices indicated that no storage of ordnance outside the designated storage igloos had occurred. A site reconnaissance also did not identify any signs of ordnance or UXO outside the storage igloos. Therefore, based on the historical review and survey, it was determined that no explosive risk at this SWMU exists outside the munitions storage igloos.

6.5.2 SWMU 11 Sampling Results

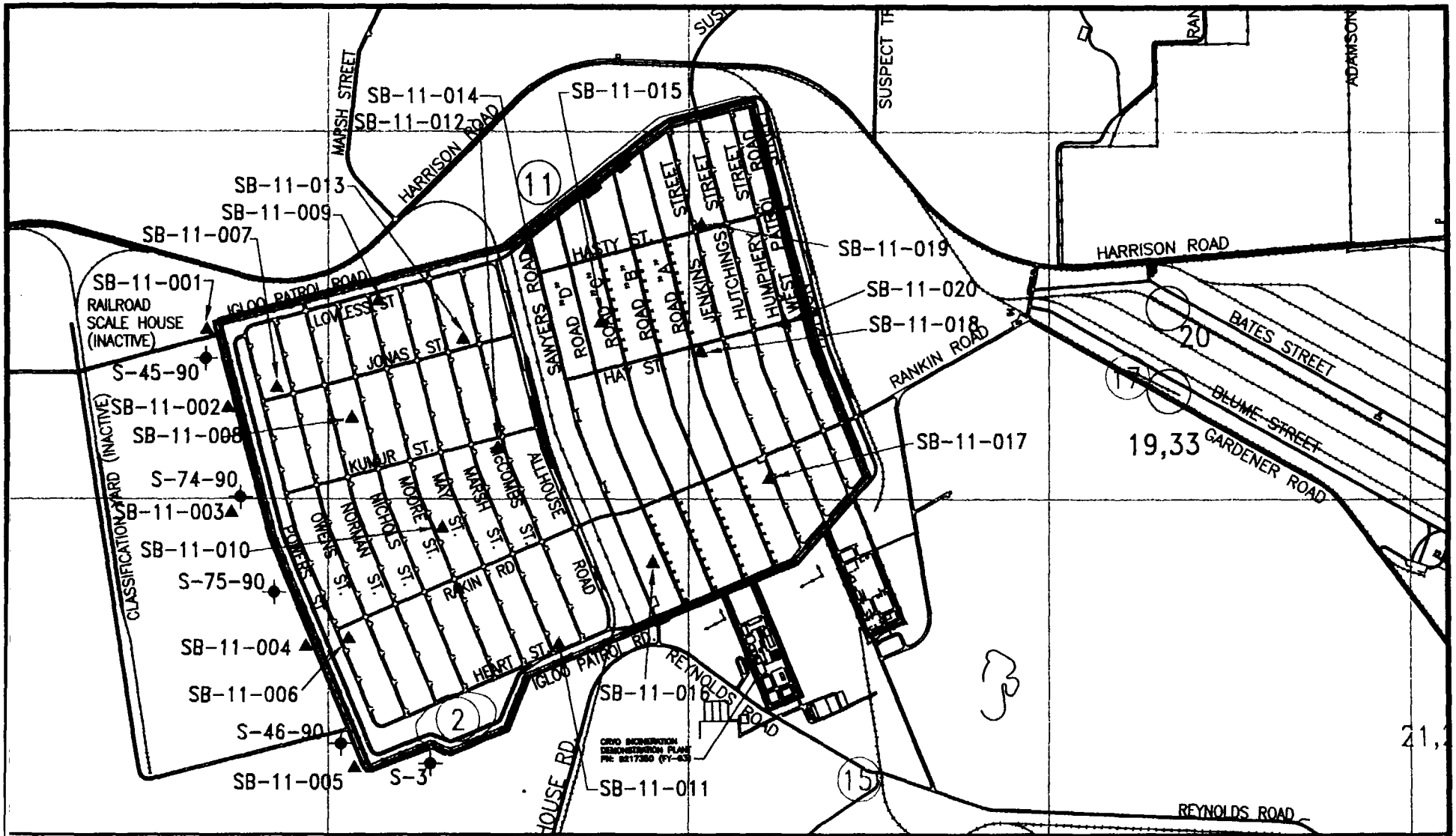
Soil samples were collected at SWMU 11 to determine if contaminants were present as a result of releases during activities associated with the chemical munition storage igloos and outdoor storage areas. Fifteen sample points were located throughout the fenced area of the SWMU at locations where contaminants from potential releases would be expected to accumulate (e.g., topographic low points adjacent to igloo doors and access ramps, and drainage ditches adjacent to storage areas). Five sample points were located immediately outside the western fence boundary in stormwater drainage swales that collect runoff from SWMU 11.

Table 6-4. SWMU 11 Phase II Planned Versus Actual Field Activities
Deseret Chemical Depot, Tooele, Utah

Phase	Planned Activities	Rationale for Planned Activities	Deviations from Planned Activities	Rationale for Deviations
Phase II (1994-95)	Conduct UXO survey.	Fulfill RCRA permit requirement; evaluate potential presence of UXO.	None; activities implemented as planned.	N/A
	Collect 20 surface (0 to 0.5 feet BLS) soil samples and 20 subsurface (2 feet BLS) soil samples; analyze all samples for VOCs, metals, cyanide, and agent breakdown products; analyze 21 of the 40 samples for SVOCs and PCBs. (Figure 6-3 shows the locations of the soil samples.)	Determine if residual chemical constituents are present from potential past spills/releases.		
	Conduct two rounds of groundwater sampling from the five existing SWMU 11 monitoring wells; analyze samples for VOCs, SVOCs, metals, cyanide, PCBs, and agent breakdown products.	Determine if contaminants are present in the groundwater downgradient from SWMU 11.		
Phase IIA (1998-99)	Resample five existing groundwater monitoring wells: S-3, S-45-90, S-46-90, S-74-90, and S-75-90. Conduct sampling using low-flow (minimal drawdown) sampling procedures (EPA 1996). Analyze all samples for VOCs, SVOCs, PCBs, metals, cyanide, agent breakdown products, and explosives.	Inconsistent results between first two sampling events. Recommendations made in Phase II RFI Report to resample wells (SAIC 1995a). Responding to UDEQ comments, explosives were added to the list of analytical parameters.	None; activities implemented as planned.	N/A
	Identify the location and delineation of vegetation within 500 feet of the SWMU.	Responding to UDEQ comments to identify habitat types surrounding SWMU under investigation.		

N/A – Not Applicable

Groundwater samples were collected from the five SWMU 11 monitoring wells during September/October 1994, January 1995, and November 1998 as part of the Phase II activities. In addition to the Phase II results, previous groundwater sampling results (e.g., Phase I) from the SWMU 11 monitoring wells were used in the risk assessment evaluation. The complete risk assessment sample list is presented in Appendix K. Figure 6-3 presents the Phase II sample locations. All of the data and statistical summary tables for SWMU 11 are presented at the end of Section 6.



LEGEND:

- ROADS AND PARKING
- RAILROAD
- (11) SAIC PHASE II SWMU
- (2) SWMU
- MONITORING WELL
- SOIL BORING

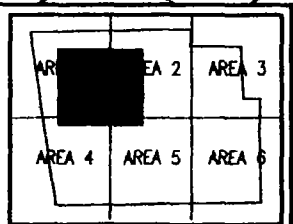
NOTES:

1.) BASE MAP INFO. WAS SCANNED AND IS ACCURATE TO 1:1000.

N

0 1000 2000

SCALE: 1" = 2000'



KEY MAP
NOT TO SCALE

Deseret Chemical Depot
Tooele, Utah

SWMU 11 – PHASE II SAMPLE LOCATIONS

Figure:	Project:	File:	Date:
6-3	01-0827-03-6523-042	7109/RFI-11SL	NOV. 2000

6.5.2.1 SWMU 11 Soil Sampling Results

Twenty soil borings (SB-11-001 through SB-11-020) were drilled throughout SWMU 11 during Phase II field activities. Fifteen sample points (SB-11-006 through SB-11-020) were located within the fenced portion of SWMU 11; five soil borings (SB-11-001 through SB-11-005) were located directly outside and adjacent to the fence along the western boundary of the SWMU. Phase II soil samples were collected from each boring at the surface and approximately 2 feet BLS and analyzed for metals, cyanide, VOCs, agent breakdown products, PCBs, and SVOCs. In addition, Dugway Proving Ground (DPG), in cooperation with DCD, conducted Lewisite analysis on split soil samples collected within the fenced area of SWMU 11. Table 6-5 summarizes the soil boring results for the detected compounds and chemicals. Data presentation tables identifying the results for all associated analyses are presented in Appendix I. This section discusses the metals identified as COPCs that also exceeded their associated upper tolerance limits (UTLs), as well as all detected organic chemicals.

SWMU 11 Surface Soil Sampling Results—Magnesium and manganese were the only COPC metals identified in the surface soil at SWMU 11. Maximum detected concentrations of both metals were less than their respective UTL (magnesium UTL: 35,700 µg/g; manganese UTL: 649 µg/g).

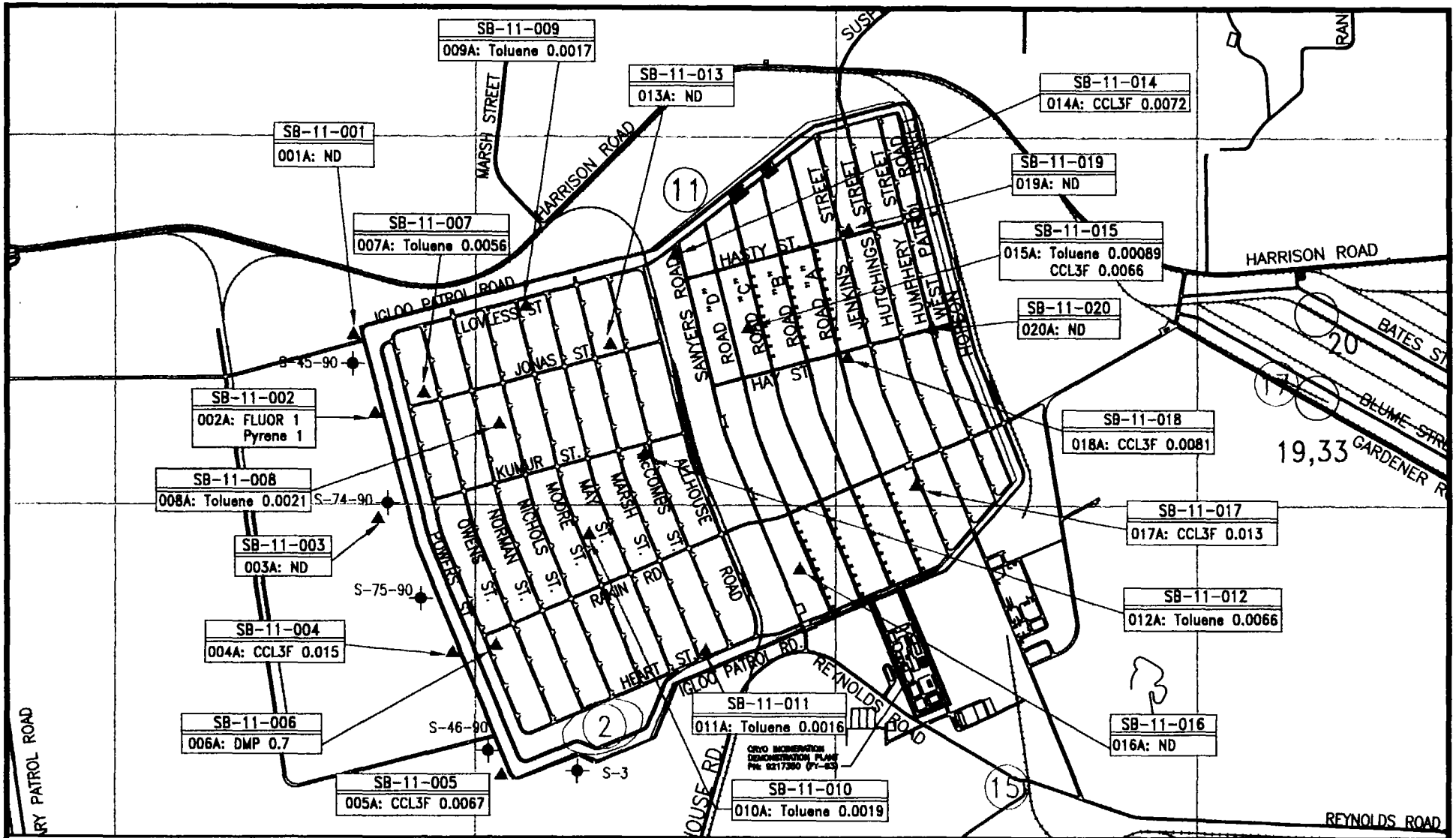
Toluene was detected in 7 of 19 surface soil samples, ranging from 0.000890 to 0.00660 µg/g. (The detection limit for toluene in soil was 0.000780 µg/g.) Table 6-6 presents a statistical summary of chemicals detected in the surface soils at SWMU 11, including the proportion of detected samples, minimum and maximum concentrations, and the location of the maximum concentration. Figure 6-4 shows the locations where chemicals were detected in the SWMU 11 surface soils.

Trichlorofluoromethane was detected in 6 of 19 surface soil samples with concentrations ranging from 0.00660 to 0.0150 µg/g. (The detection limit for trichlorofluoromethane in soil was 0.00590 µg/g). Both toluene and trichlorofluoromethane were detected in only one surface soil sample (SB-11-015A).

SVOCs were detected in 2 of 13 surface soil samples. The polycyclic aromatic hydrocarbons (PAHs) fluoranthene and pyrene were detected in surface sample SB-11-002A, each at 1 µg/g, and dimethyl phthalate was detected at 0.700 µg/g in sample SB-11-006A. (Due to matrix effects, detection limits ranged from 0.0680 to 0.300 µg/g for fluoranthene, 0.0330 to 0.200 µg/g for pyrene, and 0.170 to 0.800 µg/g for dimethyl phthalate.) The results and distribution of the detected SVOCs are shown in Figure 6-4.

PCBs, cyanide, and agent breakdown products were not detected in the SWMU 11 surface soil samples.

SWMU 11 Subsurface Soil Sampling Results—Manganese and magnesium were identified as COPCs in the subsurface soil, but the maximum detected concentrations did not exceed their respective UTL.



LEGEND:

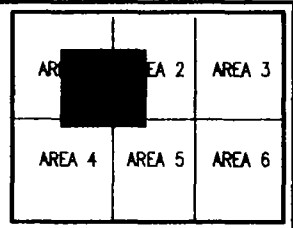
- ROADS & PARKING
- RAILROAD
- (11) SAIC PHASE II SWMU
- (2) SWMU
- MONITORING WELL
- ▲ SOIL BORING
- ND..... INORGANICS: COPCS < UTL
  ORGANICS: NOT DETECTED
- DMP.....DIMETHYL PHTHALATE
- FLUOR.....FLUORANTHENE
- CCL3F.....TRICHLOROFLOUROMETHANE

NOTES:

1.) BASE MAP INFO. WAS SCANNED AND IS ACCURATE TO 1:1000.
2.) "A" SAMPLES: 0 – 0.5 FT BLS
3.) ALL SAMPLE RESULTS IN ug/g.

N

0 1000 2000
SCALE: 1" = 2000'



KEY MAP
NOT TO SCALE

Deseret Chemical Depot
Tooele, Utah

SWMU 11 – PHASE II SURFACE SOIL SAMPLE RESULTS

Figure:	Project:	File:	Date:
6-4	01-0827-03-6523-042	7109/RFI-11SR	NOV. 2000

Toluene was detected in 8 of the 20 subsurface soil samples analyzed for VOCs, at concentrations ranging from 0.00110 to 0.00250 µg/g. Table 6-6 presents a statistical summary of chemicals detected in the subsurface soils at SWMU 11, including the proportion of detected samples, minimum and maximum concentrations, and the location of the maximum value. Figure 6-5 shows the locations where chemicals were detected in the SWMU 11 surface soils.

Trichlorofluoromethane was detected in 9 of 20 subsurface soil samples with concentrations ranging from 0.00670 to 0.0260 µg/g. Of the nine subsurface soil samples in which trichlorofluoromethane was detected, both toluene and trichlorofluoromethane were detected in three samples (SB-11-014B, SB11-015B, and SB11-018B). Figure 6-5 shows the locations of the SWMU 11 subsurface soil samples where trichlorofluoromethane was detected.

SVOCs, PCBs, cyanide, and agent breakdown products were not detected in the subsurface soils at SWMU 11.

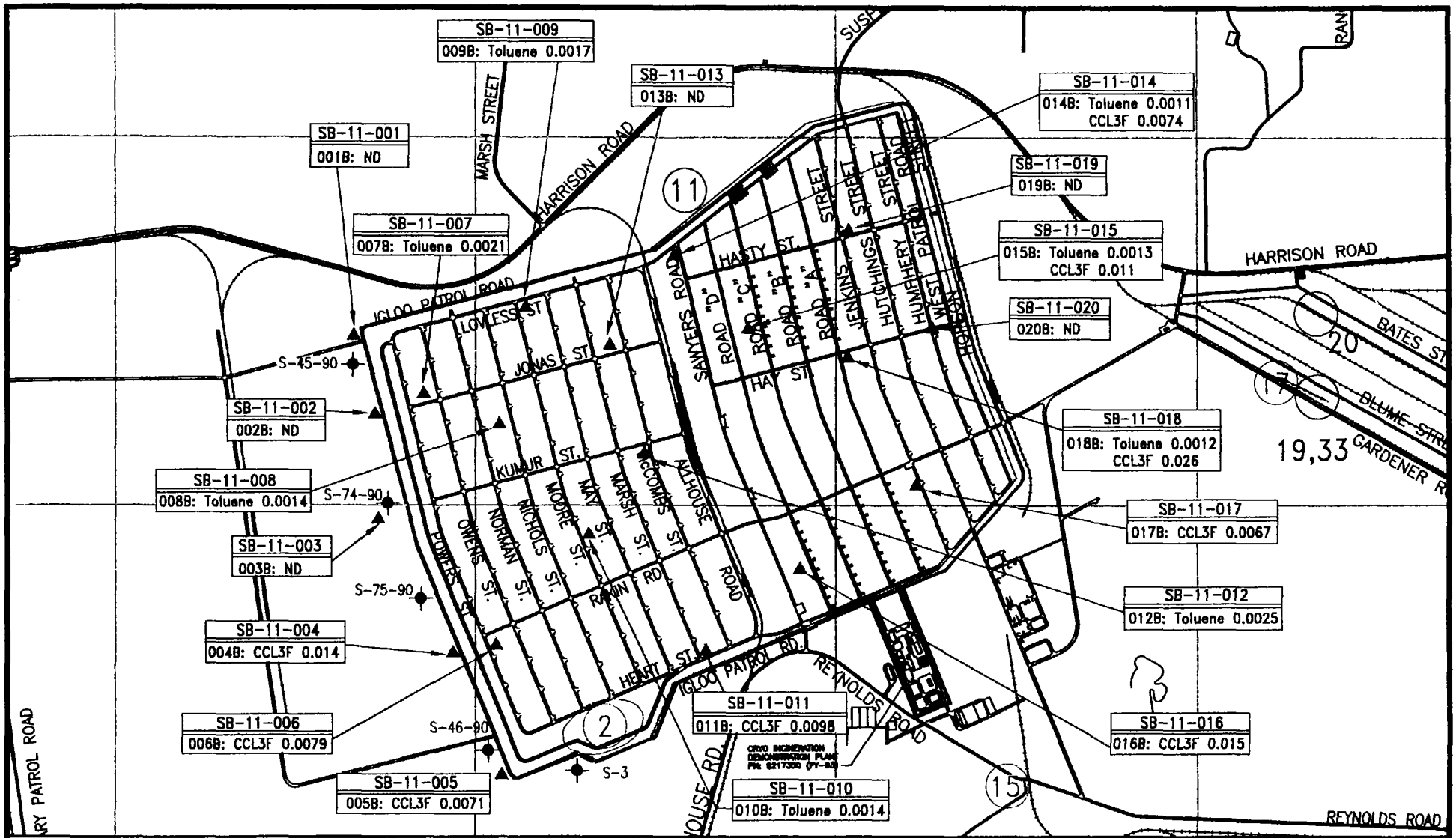
Summary of SWMU 11 Soil Sampling Results—The results of the Phase II investigation indicated very limited contamination of surface and subsurface soils. Magnesium and manganese were the only inorganic COPCs. Both metals were detected in surface and subsurface soils at concentrations less than their respective UTL.

Toluene and trichlorofluoromethane were detected at concentrations generally one order of magnitude less than their respective detection limit. No toluene or fluorocarbons were detected in the groundwater. The maximum detected concentrations of toluene and trichlorofluoromethane were 0.0066 and 0.026 µg/g, respectively, as compared to detection limits of 0.000780 and 0.00590 µg/g, respectively.

In general, there was good correlation between the sample locations where toluene was detected in surface and subsurface soils. Of the seven surface soil samples in which toluene was detected, toluene also was detected in the subsurface sample at six of these locations; toluene was detected at 0.0160 µg/g at sample location SB-11-011 in the surface soil, but was not detected in the subsurface soil. At four of these six locations, toluene decreased with depth. At one location (SB-11-009), toluene was detected at the same concentration in both soil horizons, and at one location (SB-11-015), the concentration increased in the subsurface soil sample. At two locations (SB-11-014 and SB-11-018), toluene was detected in the subsurface soil samples but not in the surface soil samples.

Although more subsurface soil samples contained trichlorofluoromethane than surface soil samples, no instances occurred at SWMU 11 where chemicals were detected in the surface and not in the subsurface. Of the six sample locations where both surface and subsurface soil contamination were detected, four locations had higher fluorocarbon concentrations in the subsurface soil than in the surface soil. In addition, at three sample locations (SB-11-006, SB-11-011, and SB-11-016), trichlorofluoromethane was detected in the subsurface soil but not in the surface soil.

PCBs, cyanide, and chemical agent breakdown products were not detected in any of the soil samples. In addition, using the procedures and protocol presented in Section 3.2.2, DCD Chemical Surety and DPG did not identify Lewisite in any of the split samples collected at SWMU 11. (See Appendix D for DPG results.)



LEGEND:

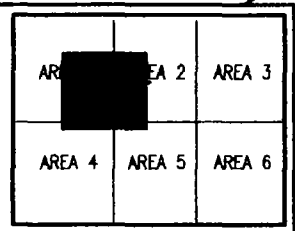
- ROADS & PARKING
- RAILROAD
- (11) SAIC PHASE II SWMU
- (2) SWMU
- MONITORING WELL
- SOIL BORING
- ND..... INORGANICS: COPCS < UTL ORGANICS: NOT DETECTED
- CCL3F... TRICHLOROFLOUROMETHANE

NOTES:

1.) BASE MAP INFO. WAS SCANNED AND IS ACCURATE TO 1:1000.
2.) "B" SAMPLES: 2 - 3 FT BLS
3.) ALL SAMPLE RESULTS IN ug/g.

N

0 1000 2000
SCALE: 1" = 2000'

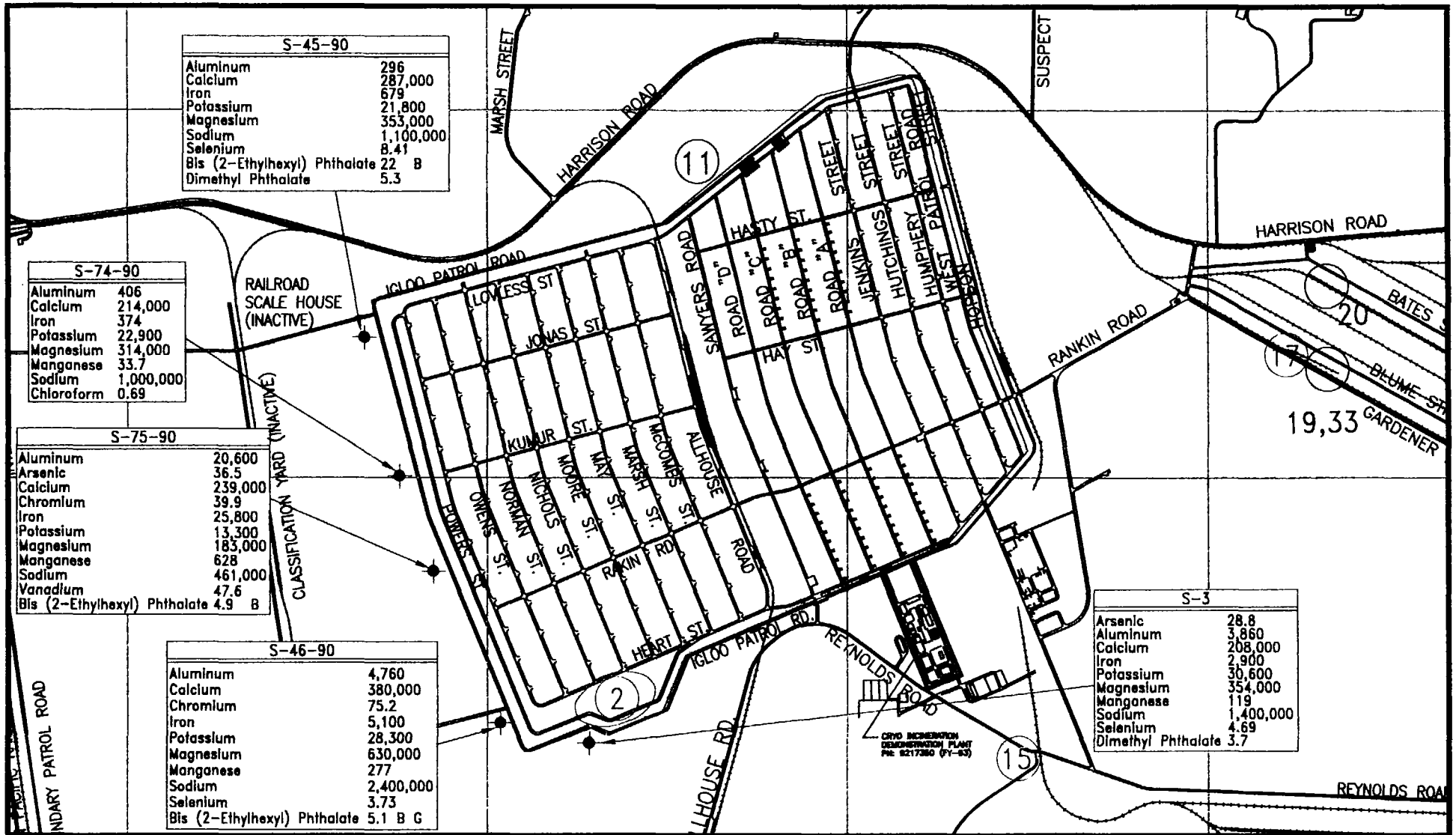


KEY MAP
NOT TO SCALE

Deseret Chemical Depot
Tooele, Utah

SWMU 11 - PHASE II SUBSURFACE SOIL SAMPLE RESULTS

Figure:	Project:	File:	Date:
6-5	01-0827-03-6523-042	7109/RFI11SRA	NOV. 2000



LEGEND:

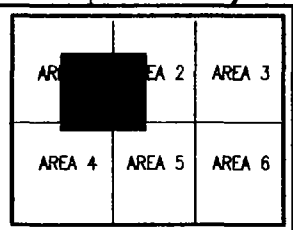
- ROADS & PARKING
- RAILROAD
- (11) SAIC PHASE II SWMU
- (2) SWMU
- MONITORING WELL
- B.....ANALYTE FOUND IN METHOD BLANK
- G..... ANALYTE FOUND IN RINSE BLANK

NOTES:

1.) BASE MAP INFO. WAS SCANNED AND IS ACCURATE TO 1:1000.
2.) ALL SAMPLE RESULTS IN ug/L.
3.) RESULTS PRESENTED FOR 1/95 SAMPLING.

N

0 1000 2000
SCALE: 1" = 2000'

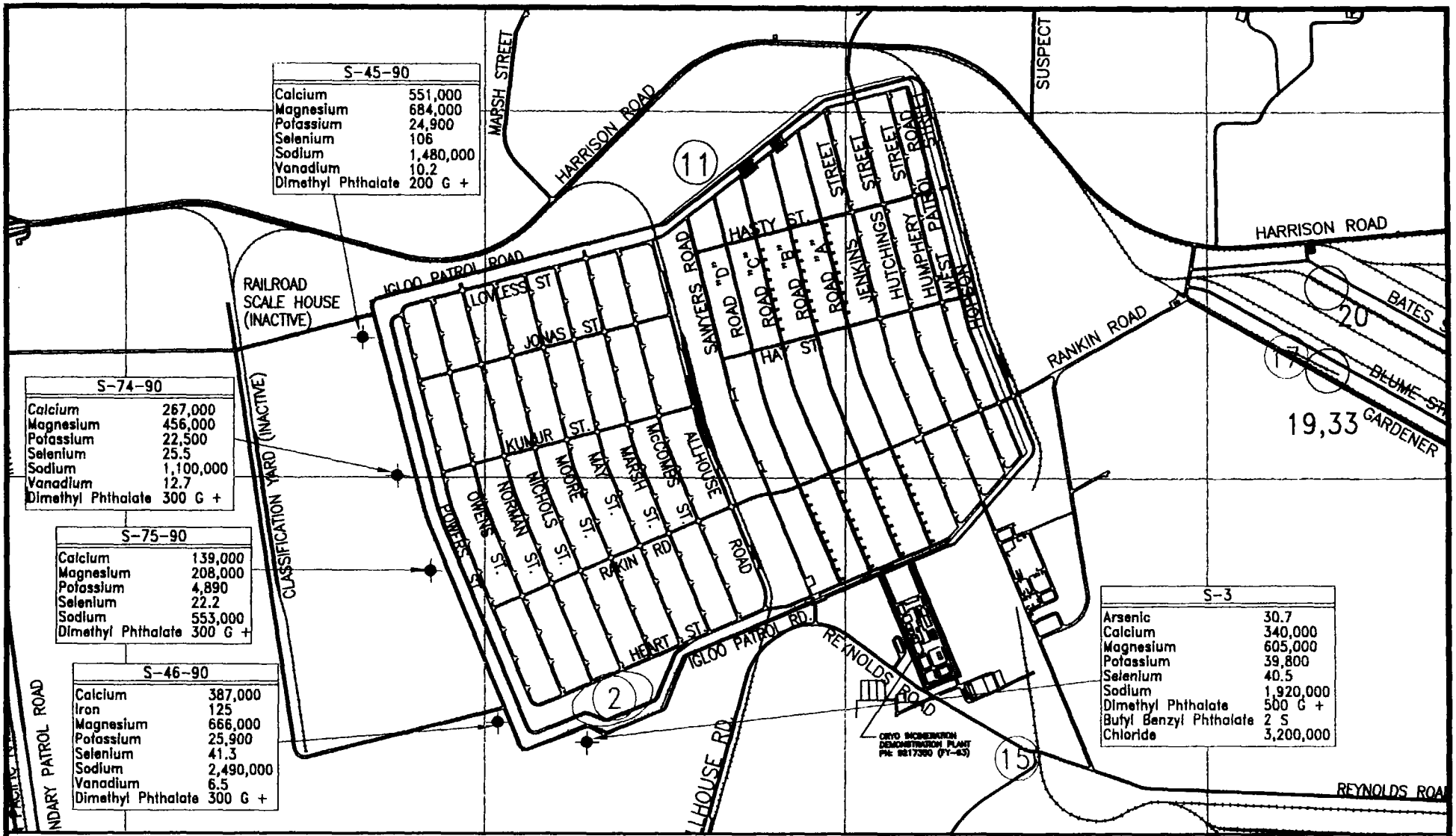


KEY MAP
NOT TO SCALE

Deseret Chemical Depot
Tooele, Utah

SWMU 11 - PHASE II GROUNDWATER SAMPLE RESULTS - JANUARY 1995

Figure:	Project:	File:	Date:
6-6	01-0827-03-6523-042	7109/RFI11SL3	NOV. 2000



LEGEND:

- ROADS & PARKING
- RAILROAD
- (11) SAIC PHASE II SWMU
- (2) SWMU
- MONITORING WELL
- G..... ANALYTE FOUND IN RINSE BLANK
- S..... NON TARGET COMPOUND
- +..... CONCENTRATION <5-10 TIMES THAT DETECTED IN BLANK

NOTES:

1.) BASE MAP INFO. WAS SCANNED AND IS ACCURATE TO 1:1000.
2.) ALL SAMPLE RESULTS IN ug/L.
3.) RESULTS PRESENTED FOR 11/98 SAMPLING.

N

0 1000 2000
SCALE: 1" = 2000'

AREA 2 | AREA 3
AREA 4 | AREA 5 | AREA 6

KEY MAP
NOT TO SCALE

Deseret Chemical Depot
Tooele, Utah

SWMU 11 - PHASE II GROUNDWATER SAMPLE RESULTS - NOVEMBER 1998

Figure:	Project:	File:	Date:
6-7	01-0827-03-6523-042	7109/RFI11SL4	NOV. 2000

Six organic compounds were detected in the SWMU 11 groundwater samples (TNT, butyl benzyl phthalate, chloroform, dimethyl phthalate, methylene chloride, and di-n-butyl phthalate [DNBP]). As noted in Table 6-8, TNT and chloroform were detected only in one sample each. Only dimethyl phthalate was detected in more than three samples.

Dimethyl phthalate was detected in 6 of 15 samples collected during Phase II at concentrations ranging from 3.70 to 50.0 µg/L. Dimethyl phthalate was detected in 14 of the 28 samples that were included in the risk evaluation at concentrations ranging from 3.70 to 160 µg/L.

Following the completion of Phase II, Kleinfelder conducted a separate sampling event in December 1999 at the SWMU 11 wells, with the exception of well S-45-90. The groundwater samples were analyzed for explosives, VOCs, and SVOCs. No explosive contamination was detected, and methylene chloride was detected at 0.700 µg/L. Dimethyl phthalate was detected in all four samples at concentrations ranging from 34 to 160 µg/L. DNBP also was detected in one of the four additional groundwater samples at an estimated concentration of 1 µg/L.

PCBs, cyanide, and agent breakdown products were not detected in the SWMU 11 groundwater samples.

Summary of SWMU 11 Groundwater Sampling Results—Because only 4 months separated the Round 1 and Round 2 groundwater sampling events during Phase II (September 27, 1994 and January 31, 1995), those results were of the same order of magnitude, although Round 2 concentrations generally were slightly higher. For example, in well S-3, arsenic increased from 27.1 to 28.8 µg/L, lead increased from 1.52 to 2.17 µg/L, and zinc increased from less than 21.1 to 42.8 µg/L.

In the nearly 4 years between Rounds 2 and 3 (from January 31, 1995 to November 18, 1998), trends were observed regarding site-related contaminants, particularly metals in the groundwater at SWMU 11. These trends are discussed below. Organic compounds detected in the groundwater were limited to low concentrations of rubber plasticizers, such as dimethyl phthalate (3.7 µg/L) and DNBP (1 µg/L), and common laboratory solvents, such as chloroform (0.69 µg/L).

Site-related concentrations of aluminum, iron, manganese, and thallium decreased between January 1995 and November 1998, with no detectable concentrations of manganese in the Round 3 samples. In addition, site-related chromium concentrations occurred in two wells only during Round 2, but not during subsequent rounds. Conversely, magnesium and selenium in the groundwater, as well as most calcium and vanadium detections, increased between sampling Rounds 2 and 3. In particular, selenium increased an order of magnitude from Round 2 to Round 3. Other metals concentrations remained largely unchanged. For example, arsenic in well S-3 (adjacent to and downgradient from SWMU 2) remained at approximately 30 µg/L during Rounds 1, 2, and 3 of sampling. Well S-3 also contained the only Phase II site-related nickel concentrations, which were detected in November 1998.

The Phase I and II groundwater data indicate that attenuation of metals concentrations is occurring. Arsenic exceeding its respective UTL in wells S-46-90 and S-74-90 decreased and

remained below the UTL value by September 1994. Similarly, site-related groundwater concentrations of nickel (wells S-45-90, S-74-90, and S-75-90), chromium (wells S-45-90 and S-74-90), mercury (well S-74-90), lead (well S-75-90), and TNT (well S-3) had all declined by the beginning of the Phase II investigation.

Based on the results of the Phase I and II investigations, limited and low concentrations of groundwater contamination exists. The identified organic and inorganic COPCs are not chemically related to the chemical agent stored in SWMU 11, nor would they be expected to be found in agent breakdown products. PCBs, cyanide, and agent breakdown products were not detected in the SWMU 11 groundwater samples.

6.6 SWMU 11 HUMAN HEALTH RISK ASSESSMENT

A baseline human health risk assessment was conducted to determine the risks associated with exposure to chemicals detected at SWMU 11. Baseline risks are defined as risks in the absence of remediation or institutional controls at the SWMU. All of the human health risk data tables for SWMU 11 are presented at the end of Section 6.

6.6.1 Baseline Human Health Risk Assessment

This section presents the results and conclusions along with SWMU-specific information pertaining to the human health risk assessment for SWMU 11. The general methods used to conduct the risk assessment and information applicable to all of the SWMU is presented in Section 4.1.

6.6.1.1 Methodology Overview

The methods for selecting COPCs are detailed in Section 4.1.1.2. As part of the COPC selection process, data were aggregated into exposure units and compared to the corresponding background data set. Monitoring data for produce and beef tissue are not available at SWMU 11. However, the risk assessment evaluates exposures to these media. Exposure point concentrations for these media were derived from soil concentrations using simple models (see Section 4.1.2.3). Therefore, the COPCs selected for soils are also the COPCs for produce and beef.

The COPCs in soil and groundwater for SWMU 11 are listed in Tables 6-9 and 6-10. Additional information is provided in the Appendix K tables entitled, "Summary Statistics and Exposure Point Concentrations." These tables present general summary statistics (e.g., minimum and maximum detected values, minimum and maximum certified reporting limits [CRLs], mean, and 95 percent upper confidence limit [UCL]) and exposure point concentrations.

The risk assessment evaluates exposures under both current and potential future land uses. Under current land use, an industrial land use scenario has been evaluated in which the receptors at potential risk of exposure are Depot workers. The most likely future land use of DCD is the same as current land use (i.e., industrial). At SWMU 11, risks under a future industrial land use scenario would be the same as the risks under the current industrial scenario. Therefore, the industrial land use scenario has a "current/future" designation to show that it is applicable to both

current and future land use. Additional future land use scenarios include a residential scenario, evaluated in accordance with the Utah Hazardous Waste Management Rules (Utah 1999), and a future construction worker scenario. Exposure pathways evaluated in the risk assessment are shown in Table 4-2.

The derivation of the exposure point concentrations for all pathways is explained in Section 4.1.2.3. The exposure point concentrations for the COPCs are presented in the Appendix K tables entitled, "Summary Statistics and Exposure Point Concentrations" and in each chemical-specific risk characterization table in Appendix L. The exposure assumptions used to estimate chronic daily intake are presented in Table 4-3.

The methods used in the risk characterization are detailed in Section 4.1.4. The human health risks are presented in terms of excess lifetime cancer risks (ELCRs), hazard indices (HIs), and blood lead levels for each pathway and receptor. The State of Utah has established target risk levels for use in determining the need for remediation. The risk assessment calculates risks and compares these to target levels. If the target levels are exceeded, the chemicals of concern (COCs) responsible for the exceedances are identified. As opposed to COPCs, COCs are identified after the quantitative risk assessment has been completed. To be consistent with the guidelines set by the State of Utah for corrective action, COCs in the human health risk assessment are individual chemicals that contribute to pathway risks exceeding any of the following:

- HI of 1
- Cancer risk greater than 1×10^{-4} for the actual or potential land use scenario
- Cancer risk greater than 1×10^{-6} for the residential land use scenario.

COCs have been identified separately for each land use scenario and may either independently exceed targets or combine to exceed targets.

6.6.1.2 Human Health Risk Assessment Results

The results of the risk characterization for all analytes except lead are presented in Tables 6-11 and 6-12 (food chain pathway risks are presented separately). Tables 6-13 and 6-14 present the COCs for each medium, their respective reasonable maximum exposure (RME) risk, and contribution to the total RME HI or cancer risk. These results are summarized below.

Depot Workers (Current/Future Land Use)—The combined noncancer HI resulting from surface soil exposures for the current Depot worker is 0.03, which is less than the target HI of 1. Cancer risks are not quantified because none of the surface soil COPCs has a U.S. Environmental Protection Agency (EPA)-approved toxicity value for carcinogenic effects.

Construction Workers (Future Land Use)—The combined noncancer HIs for the construction worker are 0.02 for surface soil exposures and 8×10^{-8} for subsurface soil exposures. Both are less than the target HI of 1. Cancer risks are not quantified because none of the surface or subsurface soil COPCs under future land use has an EPA-approved toxicity value for carcinogenic effects.

Residents (Future Land Use)—The combined noncancer HIs for the child (40 including surface soil exposures and 40 including subsurface soil exposures) and adult (20 including surface soil exposures and 20 including subsurface soil exposures) exceed the target HI of 1 due to the contribution from the groundwater ingestion pathway. Noncancer HIs were segregated according to target organ. Target organ HIs (TOHIs) exceed 1 for blood (due to antimony and thallium exposure) and skin (due to arsenic exposure). The combined cancer risk for the integrated child/adult resident (6×10^{-4}) exceeds the cancer risk target of 1×10^{-6} due to exposure to groundwater. The maximum detected concentration of lead did not exceed the 400 parts per million (ppm) screening level in soil. However, the maximum concentration of lead in the groundwater at SWMU 11 (72 µg/L) exceeded the 15 µg/L screening level. Therefore, modeling to evaluate receptor blood lead levels for resident children was conducted. The modeling results (using the arithmetic mean as the exposure point concentration) showed that blood lead levels were below the Centers for Disease Control and Prevention(CDC) target for the resident child.

The following were identified as COCs in groundwater for residents:

- Antimony — Groundwater ingestion hazard quotient (HQ) = 4 (child), 2 (adult)
- Arsenic — Groundwater ingestion HQ = 6 (child), 2 (adult)
Groundwater ingestion cancer risk = 6×10^{-4}
Groundwater dermal contact cancer risk = 2×10^{-6}
- Iron — Groundwater ingestion HQ = 2 (child), 0.9 (adult)
- Thallium — Groundwater ingestion HQ = 20 (child), 10 (adult).

For the food chain pathways (produce and beef ingestion), the combined noncancer HIs for produce grown in the surface soil (20 for the resident child and 7 for the resident adult) exceed the target HI of 1. The combined noncancer HIs for produce grown in the subsurface soil (0.05 for the resident child and 0.02 for the resident adult) do not exceed the target HI of 1. Cancer risks are not quantified because none of the surface or subsurface soil COPCs has an EPA-approved toxicity value for carcinogenic effects.

The following was identified as a COC associated with produce grown in surface soils for residents:

- Manganese — Leafy vegetable ingestion HQ = 10 (child), 4 (adult)
Tuberous vegetable ingestion HQ = 6 (child), 2 (adult)
Fruit ingestion HQ = 2 (child), 0.6 (adult).

6.7 SWMU 11 SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

This section presents conclusions along with SWMU-specific information pertaining to the screening-level ecological risk assessment (SERA) conducted for SWMU 11. Details on the methodology employed to support this analysis are provided in Section 4.2. All of the SERA data tables for SWMU 11 are presented at the end of Section 6.

6.7.1 Ecological Resources

SWMU 11 covers approximately 640 acres. The area is covered with managed grassland habitat and asphalt and gravel roads run through and along the periphery of the site. Although a chain-link fence with barbed-wire surrounds the larger area to restrict access, birds could enter and leave the SWMU easily and smaller mammals could burrow beneath the fence. Vegetation mapping by EBASCO (1994) indicated the land immediately surrounding the SWMU has a variety of habitat types: to the south there is big sage, greasewood, and rabbitbrush habitat; to the west there is big sage/greasewood and saltbush habitat; to the north there is big sage brush and saltbush habitat; and to the east there is bunchgrasses/annual forbs habitat and big sage brush habitat.

6.7.2 Ecological Risk Methodology

A SERA is necessary at SWMU 11 because habitat conditions are sufficient on and near the SWMU to support small mammals, such as white-footed deer mice (*Peromyscus maniculatus*), black-tailed jackrabbits (*Lepus californicus*), and larger native vertebrates, such as mule deer (*Odocoileus hemionus*). The size of the available habitat is approximately 640 acres composed primarily of grasses and rabbitbrush. The size of the home range of the black-tailed jackrabbit in desert conditions is approximately 40 acres (French et al. 1965). When this desert home range is compared to the available habitat on the SWMU, it becomes apparent that there is sufficient habitat (e.g., 16 times a home range area needed for a black-tailed jackrabbit). In addition, the area immediately surrounding the SWMU also is capable of supporting individuals and populations that can easily utilize the SWMU area for food, water, and cover.

Section 4.2 details the methods for conducting ecological risk assessments. The systematic methods follow four inter-related steps: problem formulation, exposure assessment, effects assessment, and risk characterization. The following summarization of risk characterization uses the previously described methods and applies them to SWMU 11.

The conceptual site model (CSM) for ecological receptors (Figure 6-8) presents the predicted completed pathways for SWMU 11. Vegetation exposure is via root uptake from soil. Ingestion of soil and vegetation was evaluated for jackrabbits. Ingestion of small mammals (i.e., jackrabbits) was evaluated for golden eagles.

The SERA consisted of a two-step process. First, detected chemicals were selected as ecological chemicals of potential concern (ecoCOPCs) based on a comparison with EPA Region V ecological data quality levels (EDQLs) for surface soil (EPA 1999c) and background concentrations. The ecoCOPCs are evaluated further in the risk characterization section below.

Risk characterization compares exposures to effects to determine the risk or likelihood of harm to plants and animals. An evaluation of the SERA assessment endpoints, using HQs for ecoCOPCs at SWMU 11, forms the quantitative basis of this risk characterization. The use of HQs to calculate the risks to ecological receptors is supported by available guidance (EPA 1992f, 1997c, and 1998).

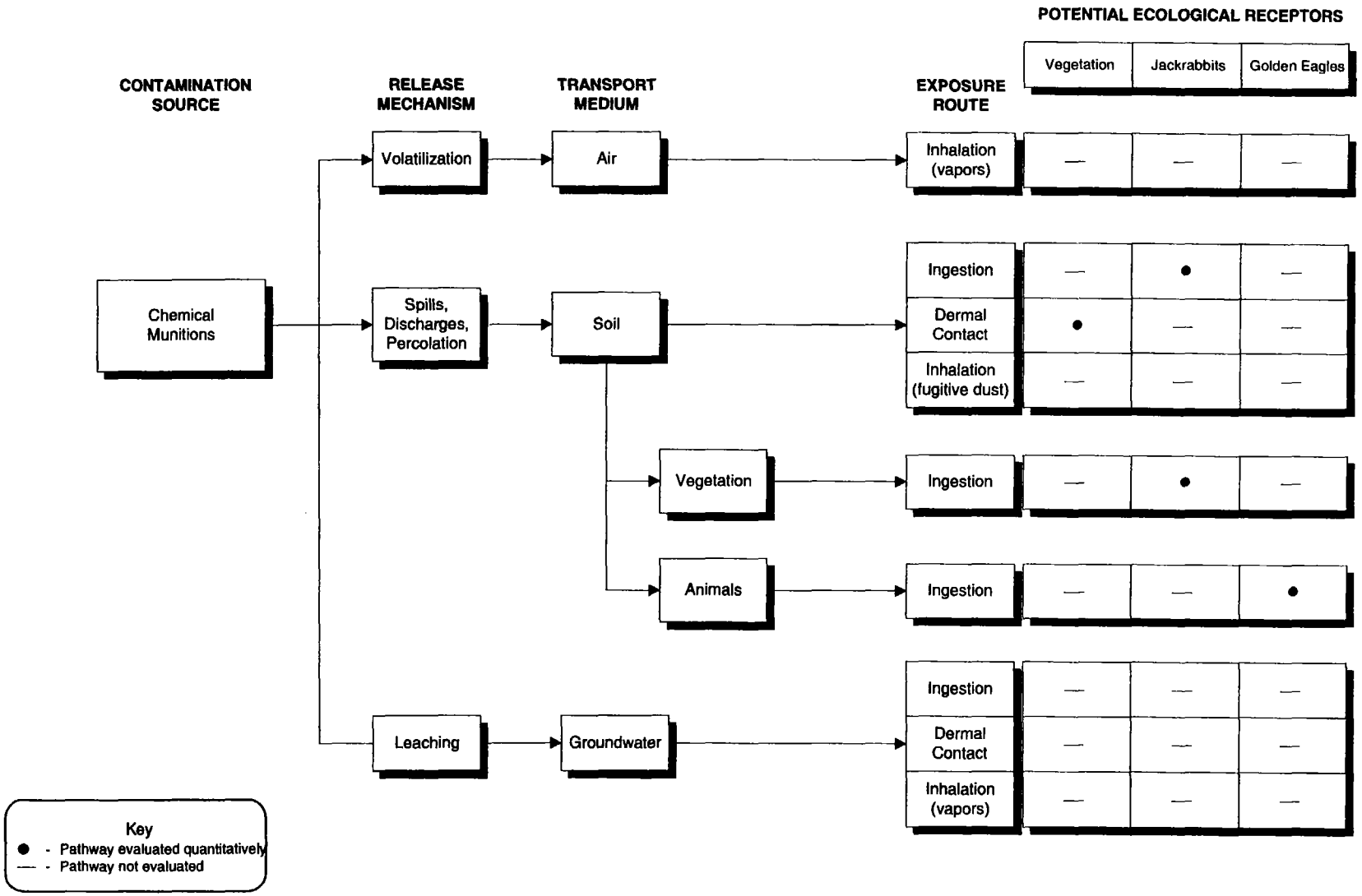


Figure 6-8. Conceptual Site Model for DCD Screening-level Ecological Risk Assessment at SWMU 11

HQs compare the estimated exposure concentrations to toxicity reference values (TRVs). Exposure concentrations are derived from measured environmental concentrations by multiplying the measured concentration by exposure parameters. As detailed in Section 4.2.5, the exposure parameter incorporates realistic adjustments to the measured environmental concentration (e.g., fraction of ingestion diet that comes from contaminated soil for small mammals) and realistic and reasonable assumptions (e.g., continuous year-round exposure). That is:

$$HQ = \frac{\text{Exposure Point Concentration} \times \text{Exposure Parameters}}{\text{Toxicity Reference Value}}$$

There are instances at SWMU 11 where an HQ could not be calculated for an ecoCOPC because insufficient data were available to establish a toxicity threshold. These ecoCOPCs are carried through the risk characterization as ecoCOPCs of uncertain risk to ecological receptors.

In determining the ecological assessment endpoints for DCD (Section 4.2.4), an HQ greater than or equal to unity (1) indicates that there is a potential for harmful ecological effects and that the ecoCOPC qualifies as an ecological chemical of concern (ecoCOC). Moreover, the risk of potential effects, severity of effects, or both, is assumed to increase with the magnitude of the ratio. An HQ threshold of 1 assumes that the toxicity threshold and exposure concentrations are based on accurate predictions and measurements. As detailed in Section 4.2.4 regarding assessment endpoints, setting the threshold of the HQ ratio at 10 rather than 1 adjusts for the overestimation of risk to receptor populations resulting from the use of conservative exposure parameters and toxicity thresholds. The eagle is an exception to the 10 threshold; its threshold is 1 because of the necessity to protect individual organisms of threatened and endangered (T&E) species.

For SWMU 11, there is one exposure unit at two soil depths (0 to 0.5 and 0.5 to 15 feet BLS). The receptors evaluated include vegetation, black-tailed jackrabbits, and golden eagles.

6.7.3 Ecological Risk Findings

No stressed plants or animals were observed during the qualitative habitat surveys. Thus, no imminent threat to ecological receptors appears to exist. The chemicals detected in the SMWU 11 surface and subsurface soil samples are presented in Tables 6-15 and 6-16, respectively. These tables include a summary of the frequency of detection, the location of the maximum detected concentration, the site exposure point concentration and range of detected concentrations, and the results of the ecological toxicity and background screens. The methods for selecting ecoCOPCs are discussed briefly in Section 6.7.2 and are presented in greater detail in Section 4.2. Two inorganics, magnesium and manganese, were selected as ecoCOPCs in surface soil (Table 6-15). Two inorganics, lead and magnesium, were selected as ecoCOPCs in subsurface soil (Table 6-16). These ecoCOPCs were evaluated further in the SERA using HQs.

There are no HQs over the threshold of 1 for any of the receptors (terrestrial plants, black-tailed jackrabbits, and golden eagles) for the ecoCOPCs at SWMU 11 at either depth

(Tables M-8 through M-13 in Appendix M). TRVs were not available for magnesium, so this ecoCOPC could not be evaluated further. However, magnesium is an essential nutrient for plants and animals and unlikely to be toxic except at extremely elevated concentrations. Based on the available information, no unacceptable ecological risks appear to be associated with surface and subsurface soil exposures at SWMU 11. Therefore, there are no ecological COCs at SWMU 11.

Future estimated risks to plants and animals at SWMU 11 are considered similar to current risks. The same species of plants and animals are assumed to be present at SWMU 11 in the future. Habitats may change as a result of ecological succession and land use changes. This may affect the exact set of receptors at some locations. However, these changes are likely subtle in the context of this work because of the similarity of habitat in all directions, and no risk calculations were made solely for future conditions. Again, future and current risks are assumed to be similar.

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			SB-11-015B		SB-11-016B	SB-11-017B	SB-11-018B	SB-11-019B	SB-11-020B
Field Sample Number			SAIC02		SAIC02	SAIC02	SAIC02	SAIC02	SAIC02
Site Type			AHOL		AHOL	AHOL	AHOL	AHOL	AHOL
Collection Date			10/24/94		10/24/94	10/24/94	10/24/94	10/25/94	10/25/94
Depth (ft)			1.90		1 70	2 20	2.20	2 00	2.00
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No.									
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No.									
Metals (JD17)									
Laboratory Id Number			TSSA*179				TSSA*187		
Parameter	Units	RL							
Lead	ug/g	0.177	**19.0**	I	N/A	N/A	**16.0**	N/A	N/A
Metals (JD19)									
Laboratory Id Number			TSSA*179		TSSA*181	TSSA*188	TSSA*187	TSSA*190	TSSA*192
Parameter	Units	RL							
Arsenic	ug/g	0 25	**4.47**		**9.68**	**9.18**	**7.68**	7.67	**8.81**
Metals (JS16)									
Laboratory Id Number			TSSA*179		TSSA*181	TSSA*188	TSSA*187	TSSA*190	TSSA*192
Parameter	Units	RL							
Aluminum	ug/g	2.350	**4080**		**5750**	**5370**	**4820**	**7410**	**8200**
Barium	ug/g	5.180	**56.3**		**62.1**	**79.6**	**107**	**135**	**103**
Beryllium	ug/g	0.500	LT 0 500		**0.838**	**1.02**	**0.743**	**0.910**	**0.923**
Cadmium	ug/g	0.700	**0.888**		**1.02**	**0.988**	**1.20**	**1.11**	**1.50**
Calcium	ug/g	100.000	**160000**		**100000**	**82000**	**97000**	**77000**	**100000**
Chromium	ug/g	4 050	**12.1**		**19.8**	**11.1**	**9.90**	**12.3**	**14.1**
Cobalt	ug/g	1.420	**3.43**		**4.88**	**5.86**	**4.60**	**6.33**	**5.36**
Copper	ug/g	0.965	**9.18**		**12.4**	**10.0**	**8.54**	**14.2**	**40.6**
Iron	ug/g	3.680	**7180**		**12000**	**9290**	**6490**	**8590**	**11300**
Lead	ug/g		N/A		**32.5**	**31.0**	N/A	**39.6**	**58.5**
Magnesium	ug/g	100.000	**10200**		**18300**	**17000**	**14700**	**12700**	**17700**
Manganese	ug/g	2.050	**261**		**442**	**477**	**381**	**440**	**511**
Nickel	ug/g	1.710	**12.7**		**22.4**	**19.8**	**14.6**	**17.0**	**21.2**
Potassium	ug/g	100.000	**1050**		**950**	**542**	**1180**	**1550**	**1860**
Sodium	ug/g	100.000	**601**		**694**	**1910**	**1080**	**1240**	**697**
Vanadium	ug/g	3.390	**12.0**		**17.2**	**13.2**	**14.4**	**16.6**	**18.1**
Zinc	ug/g	8.030	**51.9**		**72.2**	**53.6**	**37.9**	**70.6**	**118**
Volatiles (LM19)									
Laboratory Id Number			TSSA*179		TSSA*181	TSSA*188	TSSA*187	TSSA*190	TSSA*192
Parameter	Units	RL							
Toluene	ug/g	0.780	**0.00130**		LT 0.000780	LT 0.000780	**0.00120**	LT 0 000780	**0.000920** B
Trichlorofluoromethane	ug/g	5.900	**0.0110**		**0.0150**	**0.00870**	**0.0260**	**0.0270** B	**0.0150** B

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			SB-11-001A	SB-11-002A	SB-11-002A	SB-11-004A	SB-11-005A	SB-11-006A	SB-11-007A
Field Sample Number			SAIC01	SAIC01	SAIC02	SAIC01	SAIC01	SAIC01	SAIC01
Site Type			AHOL	AHOL	AHOL	AHOL	AHOL	AHOL	AHOL
Collection Date			10/25/94	10/25/94	10/25/94	10/25/94	10/25/94	10/24/94	10/24/94
Depth (ft)			0.00	0.00	0.00	0.00	0.00	0.00	0.00
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No.									
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No.									
bis(2-Ethylhexyl)phthalate	ug/g	0.620	2.00 G	LT 3.00	LT 1.00 D	N/A	N/A	LT 1.00	N/A
Volatiles (LM19)									
Laboratory Id Number			TSSA*193	TSSA*195	TSSA*291	TSSA*199	TSSA*292	TSSA*163	TSSA*164
Parameter	Units	RL							
Toluene	ug/g	0.780	LT 0.000780	LT 0.000780	LT 0.000780 D	LT 0.000780	LT 0.000780	LT 0.000780	**0.00560**
Trichlorofluoromethane	ug/g	5.900	**0.0300** B	**0.0510** B	**0.00730** D	**0.0150**	**0.00670**	LT 0.00590	LT 0.00590

Boolean Codes:
- LT - Less than the certified reporting limit
- ND - Not detected

Footnotes:
- CRL - Certified reporting limits
- ID - Identification
- N/A - Not applicable
- TICs - Tentatively Identified Compound

Flagging Codes:
- B - Analyte found in the method blank or QC blank
- D - Duplicate analysis.
- G - Analyte found in rinse blank as well as in sample.
- R - Non-target compound analyzed for but not detected (GC/MS methods).
- S - Non-target compound analyzed for and detected (GC/MS methods).
- T - Non-target compound analyzed for but not detected (non-GC/MS methods).

Qualifiers:
- I - The low-spike recovery is high.

Created on: 12/13/00

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			SB-11-008A		SB-11-009A		SB-11-010A		SB-11-011A		SB-11-012A		SB-11-013A		SB-11-014A
Field Sample Number			SAIC01		SAIC01		SAIC01		SAIC01		SAIC01		SAIC01		SAIC01
Site Type			AHOL		AHOL		AHOL		AHOL		AHOL		AHOL		AHOL
Collection Date			10/24/94		10/24/94		10/24/94		10/24/94		10/24/94		10/24/94		10/24/94
Depth (ft)			0.00		0.00		0.00		0.00		0.00		0.00		0.00
Associated Field QC Sample - Site Id															
Associated Field QC Sample - Field Sample No.															
Associated Field QC Sample - Site Id															
Associated Field QC Sample - Field Sample No.															
Metals (JD17)															
Laboratory Id Number					TSSA*168										
Parameter	Units	RL													
Lead	ug/g	0.177	N/A		14.0	I	N/A		N/A		N/A		N/A		N/A
Metals (JD19)															
Laboratory Id Number			TSSA*166		TSSA*168		TSSA*170		TSSA*295		TSSA*177		TSSA*174		TSSA*184
Parameter	Units	RL													
Arsenic	ug/g	0.25	6.18		4.91		9.73		7.63		5.19		6.64		9.07
Metals (JS16)															
Laboratory Id Number			TSSA*166		TSSA*168		TSSA*170		TSSA*295		TSSA*177		TSSA*174		TSSA*184
Parameter	Units	RL													
Aluminum	ug/g	2.350	7550		9220		10600		6100		7190		6720		8010
Barium	ug/g	5.180	178		141		178		118		157		124		131
Beryllium	ug/g	0.500	LT 0.500		0.876		0.808		0.749	LT	0.500	LT	0.500		0.905
Cadmium	ug/g	0.700	LT 0.700	LT	0.700		1.27	LT	0.700	LT	0.700	LT	0.700	LT	0.700
Calcium	ug/g	100.000	92000		74000		100000		72000		68000		80000		76000
Chromium	ug/g	4.050	11.5		11.7		17.1		9.18		12.0		10.6		13.5
Cobalt	ug/g	1.420	5.57		5.35		6.13		4.17		5.61		4.91		5.62
Copper	ug/g	0.965	16.7		15.3		21.9		15.0		15.8		18.0		17.1
Iron	ug/g	3.680	9860		9950		13800		6860		10200		8890		11500
Lead	ug/g		23.3		N/A		51.9		24.0		29.5		34.8		37.6
Magnesium	ug/g	100.000	13700		12100		18200		13800		12200		11600		13600
Manganese	ug/g	2.050	542		338		555		392		541		485		447
Nickel	ug/g	1.710	17.8		14.3		25.2		14.3		18.2		14.7		20.7
Potassium	ug/g	100.000	3240		3870		3270		2150		2500		3150		2380
Silver	ug/g	0.589	LT 0.589	LT	0.589	LT	0.589	LT	0.589	LT	0.589	LT	0.589	LT	0.589
Sodium	ug/g	100.000	1870		1140		1240		916		1210		849		789
Vanadium	ug/g	3.390	17.8		17.1		23.6		12.0		16.3		15.3		19.0
Zinc	ug/g	8.030	67.8		49.4		106		52.4		69.0		74.9		86.5
Semivolatiles (LM18)															
Laboratory Id Number			TSSA*166				TSSA*170		TSSA*295		TSSA*177				TSSA*184
Parameter	Units	RL													
Dimethyl Phthalate	ug/g	0.170	LT 0.300		N/A		LT 0.300		LT 0.800		LT 0.300		N/A		LT 0.170
Fluoranthene	ug/g	0.068	LT 0.100		N/A		LT 0.100		LT 0.300		LT 0.100		N/A		LT 0.0680
Pyrene	ug/g	0.033	LT 0.0700		N/A		LT 0.0700		LT 0.200		LT 0.0700		N/A		LT 0.0330

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID				SB-11-008A		SB-11-009A		SB-11-010A		SB-11-011A		SB-11-012A		SB-11-013A		SB-11-014A
Field Sample Number				SAIC01		SAIC01		SAIC01		SAIC01		SAIC01		SAIC01		SAIC01
Site Type				AHOL		AHOL		AHOL		AHOL		AHOL		AHOL		AHOL
Collection Date				10/24/94		10/24/94		10/24/94		10/24/94		10/24/94		10/24/94		10/24/94
Depth (ft)				0.00		0.00		0.00		0.00		0.00		0.00		0.00
Associated Field QC Sample - Site Id																
Associated Field QC Sample - Field Sample No.																
Associated Field QC Sample - Site Id																
Associated Field QC Sample - Field Sample No.																
bis(2-Ethylhexyl)phthalate	ug/g	0.620	LT	1.00		N/A	LT	1.00	LT	3.00	LT	1.00		N/A	LT	0.620
Volatiles (LM19)																
Laboratory Id Number				TSSA*166		TSSA*168		TSSA*170		TSSA*295		TSSA*177		TSSA*174		TSSA*184
Parameter	Units	RL														
Toluene	ug/g	0.780		**0.00210**		**0.00170**		**0.00190**		**0.00160**		**0.00660**		**0.00200** B	LT	0.000780
Trichlorofluoromethane	ug/g	5.900	LT	0.00590	LT	0.00590	LT	0.00590	LT	0.00590	LT	0.00590	LT	0.00590		**0.00720**

Created on: 12/13/00

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			SB-11-015A		SB-11-016A		SB-11-017A		SB-11-018A		SB-11-019A		SB-11-020A
Field Sample Number			SAIC01		SAIC01		SAIC01		SAIC01		SAIC01		SAIC01
Site Type			AHOL		AHOL		AHOL		AHOL		AHOL		AHOL
Collection Date			10/24/94		10/24/94		10/24/94		10/24/94		10/25/94		10/25/94
Depth (ft)			0.00		0.00		0.00		0.00		0.00		0.00
Associated Field QC Sample - Site Id													
Associated Field QC Sample - Field Sample No.													
Associated Field QC Sample - Site Id													
Associated Field QC Sample - Field Sample No.													
Metals (JD17)													
Laboratory Id Number									TSSA*186				
Parameter	Units	RL											
Lead	ug/g	0.177	N/A		N/A		N/A		16.0	I	N/A		N/A
Metals (JD19)													
Laboratory Id Number			TSSA*182		TSSA*180		TSSA*185		TSSA*186		TSSA*189		TSSA*191
Parameter	Units	RL											
Arsenic	ug/g	0.25	9.10		8.92		16.0		8.07		4.95		5.87
Metals (JS16)													
Laboratory Id Number			TSSA*182		TSSA*180		TSSA*185		TSSA*186		TSSA*189		TSSA*191
Parameter	Units	RL											
Aluminum	ug/g	2.350	6670		8050		5030		5430		4270		7280
Barium	ug/g	5.180	98.7		110		95.3		154		122		125
Beryllium	ug/g	0.500	LT 0.500	LT	0.500	LT	0.500	LT	0.500	LT	0.500	LT	0.500
Cadmium	ug/g	0.700	0.967		1.20	LT	0.700	LT	0.700	LT	0.700		1.04
Calcium	ug/g	100.000	82000		110000		100000		120000		74000		82000
Chromium	ug/g	4.050	11.9		14.6		9.31		7.73		5.51		10.9
Cobalt	ug/g	1.420	5.23		6.21		4.19		3.71		4.08		4.86
Copper	ug/g	0.965	14.4		16.9		16.6		30.7		9.94		13.0
Iron	ug/g	3.680	9480		13000		8190		6640		3690		8060
Lead	ug/g		34.2		52.0		41.5		N/A		20.8		25.5
Magnesium	ug/g	100.000	13500		20500		18000		10800		9170		13500
Manganese	ug/g	2.050	378		566		433		360		430		445
Nickel	ug/g	1.710	17.3		24.6		16.0		10.8		9.75		14.2
Potassium	ug/g	100.000	1980		1980		1020		2420		2020		2740
Silver	ug/g	0.589	LT 0.589		1.26	LT	0.589	LT	0.589	LT	0.589	LT	0.589
Sodium	ug/g	100.000	555		823		2680		642		619		892
Vanadium	ug/g	3.390	16.3		21.2		20.7		17.5		7.42		13.4
Zinc	ug/g	8.030	76.1		92.4		63.7		39.0		33.6		63.9
Semivolatiles (LM18)													
Laboratory Id Number			TSSA*182		TSSA*180		TSSA*185				TSSA*189		TSSA*191
Parameter	Units	RL											
Dimethyl Phthalate	ug/g	0.170	LT 0.170	LT	0.170	LT	0.170		N/A	LT	0.170	LT	0.800
Fluoranthene	ug/g	0.068	LT 0.0680	LT	0.0680	LT	0.0680		N/A	LT	0.0680	LT	0.300
Pyrene	ug/g	0.033	LT 0.0330	LT	0.0330	LT	0.0330		N/A	LT	0.0330	LT	0.200

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID				SB-11-015A		SB-11-016A		SB-11-017A		SB-11-018A		SB-11-019A		SB-11-020A
Field Sample Number				SAIC01		SAIC01		SAIC01		SAIC01		SAIC01		SAIC01
Site Type				AHOL		AHOL		AHOL		AHOL		AHOL		AHOL
Collection Date				10/24/94		10/24/94		10/24/94		10/24/94		10/25/94		10/25/94
Depth (ft)				0.00		0.00		0.00		0.00		0.00		0.00
Associated Field QC Sample - Site Id														
Associated Field QC Sample - Field Sample No.														
Associated Field QC Sample - Site Id														
Associated Field QC Sample - Field Sample No.														
bis(2-Ethylhexyl)phthalate	ug/g	0.620	LT	0.620	LT	0.620	LT	0.620		N/A	LT	0.620	LT	3.00

Volatiles (LM19)

Laboratory Id Number				TSSA*182		TSSA*180		TSSA*185		TSSA*186		TSSA*189		TSSA*191
Parameter	Units	RL												
Toluene	ug/g	0.780		**0.000890**	LT	0.000780	LT	0.000780	LT	0.000780		**0.000930** B		**0.00140** B
Trichlorofluoromethane	ug/g	5.900		**0.00660**	LT	0.00590		**0.0130**		**0.00810**		**0.0280** B		**0.0190** B

Created on: 12/13/00

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			SB-11-001B	SB-11-002B	SB-11-003B	SB-11-004B	SB-11-005B	SB-11-006B	SB-11-007B	
Field Sample Number			SAIC02	SAIC02	SAIC02	SAIC02	SAIC02	SAIC02	SAIC02	
Site Type			AHOL	AHOL	AHOL	AHOL	AHOL	AHOL	AHOL	
Collection Date			10/25/94	10/25/94	10/25/94	10/25/94	10/25/94	10/24/94	10/24/94	
Depth (ft)			2.00	2.20	2.50	2.60	2.00	2.30	3.00	
Associated Field QC Sample - Site Id										
Associated Field QC Sample - Field Sample No.										
Associated Field QC Sample - Site Id										
Associated Field QC Sample - Field Sample No										
Metals (JD17)										
Laboratory Id Number			TSSA*194	TSSA*196			TSSA*294		TSSA*165	
Parameter	Units	RL								
Lead	ug/g	0.177	**40.0**	**9.10**	N/A	N/A	**19.0**	N/A	**15.0**	I
Metals (JD19)										
Laboratory Id Number			TSSA*194	TSSA*196	TSSA*198	TSSA*200	TSSA*294	TSSA*173	TSSA*165	
Parameter	Units	RL								
Arsenic	ug/g	0.25	**5.87**	**7.81**	**7.14**	**8.21**	**7.43**	**10.9**	**6.77**	
Metals (JS16)										
Laboratory Id Number			TSSA*194	TSSA*196	TSSA*198	TSSA*200	TSSA*294	TSSA*173	TSSA*165	
Parameter	Units	RL								
Aluminum	ug/g	2.350	**10100**	**2990**	**10100**	**4470**	**5480**	**5510**	**5810**	
Barium	ug/g	5.180	**164**	**38.5**	**129**	**92.4**	**51.7**	**60.0**	**297**	
Beryllium	ug/g	0.500	**0.810**	LT 0.500	**1.32**	LT 0.500	**0.844**	LT 0.500	LT 0.500	
Cadmium	ug/g	0.700	**1.03**	LT 0.700	**1.45**	**1.10**	LT 0.700	**1.15**	LT 0.700	
Calcium	ug/g	100.000	**80000**	**120000**	**70000**	**97000**	**110000**	**96000**	**97000**	
Chromium	ug/g	4.050	**14.9**	**6.75**	**14.9**	**8.71**	**10.8**	**12.4**	**7.29**	
Cobalt	ug/g	1.420	**6.32**	**2.39**	**6.18**	**3.84**	**4.42**	**5.04**	**3.91**	
Copper	ug/g	0.965	**16.9**	**5.05**	**17.4**	**11.1**	**9.21**	**13.8**	**12.0**	
Iron	ug/g	3.680	**11300**	**5170**	**11700**	**6020**	**9690**	**11800**	**5450**	
Lead	ug/g		N/A	N/A	**32.5**	**45.1**	N/A	**45.1**	N/A	
Magnesium	ug/g	100.000	**14600**	**15400**	**12200**	**20300**	**20700**	**20400**	**13900**	
Manganese	ug/g	2.050	**480**	**160**	**462**	**419**	**357**	**440**	**393**	
Nickel	ug/g	1.710	**18.3**	**9.58**	**21.9**	**12.5**	**17.1**	**21.9**	**10.1**	
Potassium	ug/g	100.000	**4250**	**513**	**3410**	**1180**	**1400**	**875**	**2820**	
Sodium	ug/g	100.000	**1010**	**614**	**1240**	**696**	**857**	**834**	**887**	
Vanadium	ug/g	3.390	**18.5**	**8.41**	**20.6**	**11.7**	**14.4**	**14.7**	**11.8**	
Zinc	ug/g	8.030	**165**	**29.4**	**101**	**87.1**	**55.3**	**81.3**	**36.6**	
Volatiles (LM19)										
Laboratory Id Number			TSSA*194	TSSA*196	TSSA*198	TSSA*200	TSSA*294	TSSA*173	TSSA*165	
Parameter	Units	RL								
Toluene	ug/g	0.780	LT 0.000780	LT 0.000780	LT 0.000780	LT 0.000780	LT 0.000780	LT 0.000780	**0.00210**	
Trichlorofluoromethane	ug/g	5.900	**0.0440** B	**0.0400** B	**0.0470** B	**0.0140**	**0.00710**	**0.00790**	LT 0.00590	

Boolean Codes:
LT - Less than the certified reporting limit
ND - Not detected
Footnotes:
CRL - Certified reporting limits
ID - Identification
N/A - Not applicable
TICs - Tentatively Identified Compound
Flagging Codes:
B - Analyte found in the method blank or QC blank
Qualifiers:
I - The low-spike recovery is high

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			SB-11-008B	SB-11-009B	SB-11-010B	SB-11-011B	SB-11-012B	SB-11-013B	SB-11-014B
Field Sample Number			SAIC02	SAIC02	SAIC02	SAIC02	SAIC02	SAIC02	SAIC02
Site Type			AHOL	AHOL	AHOL	AHOL	AHOL	AHOL	AHOL
Collection Date			10/24/94	10/24/94	10/24/94	10/24/94	10/24/94	10/24/94	10/24/94
Depth (ft)			2.20	2.30	2.10	2.10	2.20	2.00	1.80
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No									
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No.									
Metals (JD17)									
Laboratory Id Number					TSSA*171				
Parameter	Units	RL							
Lead	ug/g	0.177	N/A	N/A	**21.0**	N/A	N/A	N/A	N/A
Metals (JD19)									
Laboratory Id Number			TSSA*167	TSSA*169	TSSA*171	TSSA*178	TSSA*172	TSSA*175	TSSA*183
Parameter	Units	RL							
Arsenic	ug/g	0.25	**13.0**	**10.0**	**6.70**	**5.53**	**3.98**	**11.0**	**9.30**
Metals (JS16)									
Laboratory Id Number			TSSA*167	TSSA*169	TSSA*171	TSSA*178	TSSA*172	TSSA*175	TSSA*183
Parameter	Units	RL							
Aluminum	ug/g	2.350	**11300**	**12800**	**2420**	**2180**	**4290**	**9150**	**9520**
Barium	ug/g	5.180	**159**	**163**	**37.2**	**29.5**	**48.2**	**138**	**102**
Beryllium	ug/g	0.500	**1.04**	**1.08**	LT 0.500	LT 0.500	LT 0.500	LT 0.500	LT 0.500
Cadmium	ug/g	0.700	**1.49**	**1.04**	LT 0.700	LT 0.700	LT 0.700	**1.32**	**2.67**
Calcium	ug/g	100.000	**95000**	**50500**	**160000**	**170000**	**130000**	**59900**	**84000**
Chromium	ug/g	4.050	**19.0**	**19.3**	**8.95**	**8.70**	**12.3**	**15.1**	**18.0**
Cobalt	ug/g	1.420	**7.83**	**7.42**	**2.08**	**2.24**	**3.99**	**6.70**	**6.07**
Copper	ug/g	0.965	**21.9**	**18.6**	**6.37**	**9.50**	**10.1**	**18.8**	**30.6**
Iron	ug/g	3.680	**15300**	**15800**	**4440**	**7280**	**8150**	**13700**	**15100**
Lead	ug/g		**34.9**	**20.9**	N/A	**21.8**	**21.5**	**33.2**	**120**
Magnesium	ug/g	100.000	**13900**	**10400**	**8130**	**15300**	**12200**	**9110**	**14000**
Manganese	ug/g	2.050	**579**	**640**	**206**	**314**	**293**	**534**	**619**
Nickel	ug/g	1.710	**27.4**	**24.0**	**8.19**	**13.6**	**14.8**	**25.4**	**33.1**
Potassium	ug/g	100.000	**3390**	**3220**	**500**	**209**	**724**	**2420**	**1340**
Sodium	ug/g	100.000	**5600**	**2920**	**528**	**810**	**1470**	**2880**	**1070**
Vanadium	ug/g	3.390	**25.7**	**24.5**	**7.91**	**11.5**	**12.1**	**22.7**	**21.7**
Zinc	ug/g	8.030	**109**	**90.4**	**33.8**	**51.1**	**48.7**	**94.7**	**211**
Volatiles (LM19)									
Laboratory Id Number			TSSA*167	TSSA*169	TSSA*171	TSSA*178	TSSA*172	TSSA*175	TSSA*183
Parameter	Units	RL							
Toluene	ug/g	0.780	**0.00140**	**0.00170**	**0.00140**	LT 0.000780	**0.00250**	LT 0.000780	**0.00110**
Trichlorofluoromethane	ug/g	5.900	LT 0.00590	LT 0.00590	LT 0.00590	**0.00980**	LT 0.00590	LT 0.00590	**0.00740**

Table 6-5. Data Summary Table: Soil - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			SB-11-015B		SB-11-016B	SB-11-017B	SB-11-018B	SB-11-019B	SB-11-020B
Field Sample Number			SAIC02		SAIC02	SAIC02	SAIC02	SAIC02	SAIC02
Site Type			AHOL		AHOL	AHOL	AHOL	AHOL	AHOL
Collection Date			10/24/94		10/24/94	10/24/94	10/24/94	10/25/94	10/25/94
Depth (ft)			1.90		1.70	2.20	2.20	2.00	2.00
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No.									
Associated Field QC Sample - Site Id									
Associated Field QC Sample - Field Sample No.									
Metals (JD17)									
Laboratory Id Number			TSSA*179				TSSA*187		
Parameter	Units	RL							
Lead	ug/g	0.177	**19.0**	I	N/A	N/A	**16.0**	N/A	N/A
Metals (JD19)									
Laboratory Id Number			TSSA*179		TSSA*181	TSSA*188	TSSA*187	TSSA*190	TSSA*192
Parameter	Units	RL							
Arsenic	ug/g	0.25	**4.47**		**9.68**	**9.18**	**7.68**	7.67	**8.81**
Metals (JS16)									
Laboratory Id Number			TSSA*179		TSSA*181	TSSA*188	TSSA*187	TSSA*190	TSSA*192
Parameter	Units	RL							
Aluminum	ug/g	2.350	**4080**		**5750**	**5370**	**4820**	**7410**	**8200**
Barium	ug/g	5.180	**56.3**		**82.1**	**79.6**	**107**	**135**	**103**
Beryllium	ug/g	0.500	LT 0.500		**0.838**	**1.02**	**0.743**	**0.910**	**0.923**
Cadmium	ug/g	0.700	**0.898**		1.02	**0.989**	1.20	1.11	1.50
Calcium	ug/g	100.000	**160000**		**100000**	**82000**	**97000**	**77000**	**100000**
Chromium	ug/g	4.050	**12.1**		**19.8**	**11.1**	**9.90**	**12.3**	**14.1**
Cobalt	ug/g	1.420	**3.43**		**4.88**	**5.86**	**4.60**	**6.33**	**5.36**
Copper	ug/g	0.965	**9.18**		**12.4**	**10.0**	**8.54**	**14.2**	**40.6**
Iron	ug/g	3.680	**7180**		**12000**	**9290**	**6490**	**8590**	**11300**
Lead	ug/g		N/A		**32.5**	**31.0**	N/A	**39.6**	**59.5**
Magnesium	ug/g	100.000	**10200**		**18300**	**17000**	**14700**	**12700**	**17700**
Manganese	ug/g	2.050	**261**		**442**	**477**	**381**	**440**	**511**
Nickel	ug/g	1.710	**12.7**		**22.4**	**19.6**	**14.6**	**17.0**	**21.2**
Potassium	ug/g	100.000	**1050**		**950**	**542**	**1180**	**1550**	**1860**
Sodium	ug/g	100.000	**601**		**894**	**1910**	**1080**	**1240**	**697**
Vanadium	ug/g	3.390	**12.0**		**17.2**	**13.2**	**14.4**	**16.6**	**18.1**
Zinc	ug/g	8.030	**51.9**		**72.2**	**53.6**	**37.9**	**70.6**	**118**
Volatiles (LM19)									
Laboratory Id Number			TSSA*179		TSSA*181	TSSA*188	TSSA*187	TSSA*190	TSSA*192
Parameter	Units	RL							
Toluene	ug/g	0.780	**0.00130**		LT 0.000780	LT 0.000780	**0.00120**	LT 0.000780	**0.000920** B
Trichlorofluoromethane	ug/g	5.900	**0.0110**		**0.0150**	**0.00670**	**0.0260**	**0.0270** B	**0.0150** B

Table 6-6. Summary of Chemicals Detected in Soils at SWMU 11
Deseret Chemical Depot, DCD, Tooele, Utah

Chemical	Units	Proportion of Detects All Samples[a]	Detects Minimum	Detects Maximum	95% UTL of Background Data Set		Proportion of Detected Results Greater Than Background UTL	Maximum Concentration Location	Maximum Concentration Depth	COPC?
Surface Soils										
Inorganics										
Aluminum	ug/g	19 / 19	4,270	10,600	24,256		0 / 19	SB-11-010A	0	No
Arsenic	ug/g	19 / 19	4.1	16	3.4	*	0 / 19	SB-11-017A	0	No
Barium	ug/g	19 / 19	84	183	423		0 / 19	SB-11-002A	0	No
Beryllium	ug/g	7 / 19	0.67	0.97	1.2		0 / 7	SB-11-004A	0	No
Cadmium	ug/g	7 / 19	0.97	1.5	21		0 / 7	SB-11-004A	0	No
Calcium	ug/g	19 / 19	67,000	120,000	250,000		0 / 19	SB-11-018A	0	No
Chromium	ug/g	19 / 19	5.5	17	56		0 / 19	SB-11-010A	0	No
Cobalt	ug/g	19 / 19	3.5	6.3	10		0 / 19	SB-11-004A	0	No
Copper	ug/g	19 / 19	9.9	31	162		0 / 19	SB-11-018A	0	No
Iron	ug/g	19 / 19	3,690	13,800	21,340		0 / 19	SB-11-010A	0	No
Lead	ug/g	19 / 19	14	53	401		0 / 19	SB-11-004A	0	No
Magnesium	ug/g	19 / 19	9,170	21,500	35,700		0 / 19	SB-11-005A	0	Yes
Manganese	ug/g	19 / 19	338	588	649		0 / 19	SB-11-004A	0	Yes
Nickel	ug/g	19 / 19	9.8	25	33		0 / 19	SB-11-010A	0	No
Potassium	ug/g	19 / 19	1,020	4,010	6,751		0 / 19	SB-11-001A	0	No
Silver	ug/g	2 / 19	0.71	1.3	0.47	*	0 / 2	SB-11-016A	0	No
Sodium	ug/g	19 / 19	555	2,680	5,610		0 / 19	SB-11-017A	0	No
Vanadium	ug/g	19 / 19	7.4	24	55		0 / 19	SB-11-010A	0	No
Zinc	ug/g	19 / 19	34	2,170	385		1 / 19	SB-11-004A	0	No
Organics										
Dimethyl Phthalate	ug/g	1 / 13	0.70	0.70	0.0		1 / 1	SB-11-006A	0	Yes
Fluoranthene	ug/g	1 / 13	1.00	1.00	0.0		1 / 1	SB-11-002A	0	Yes
Pyrene	ug/g	1 / 13	1.00	1.00	0.0		1 / 1	SB-11-002A	0	Yes
Toluene	ug/g	7 / 19	0.00089	0.0066	0.0		7 / 7	SB-11-012A	0	Yes
Trichlorofluoromethane	ug/g	6 / 19	0.0066	0.015	0.0		6 / 6	SB-11-004A	0	Yes
Subsurface Soils										
Inorganics										
Aluminum	ug/g	20 / 20	2,180	12,800	24,256		0 / 20	SB-11-009B	2.3	No
Arsenic	ug/g	20 / 20	4.0	13	3.4	*	0 / 20	SB-11-006B	2.2	No
Barium	ug/g	20 / 20	30	297	423		0 / 20	SB-11-007B	3	No
Beryllium	ug/g	10 / 20	0.74	1.3	1.2		1 / 10	SB-11-003B	2.5	No
Cadmium	ug/g	14 / 20	0.90	2.7	21		0 / 14	SB-11-014B	1.8	No
Calcium	ug/g	20 / 20	50,500	170,000	250,000		0 / 20	SB-11-011B	2.1	No
Chromium	ug/g	20 / 20	6.8	20	56		0 / 20	SB-11-016B	1.7	No
Cobalt	ug/g	20 / 20	2.1	7.8	10		0 / 20	SB-11-004B	2.2	No
Copper	ug/g	20 / 20	5.1	41	162		0 / 20	SB-11-020B	2	No
Iron	ug/g	20 / 20	4,440	15,800	21,340		0 / 20	SB-11-009B	2.3	No
Lead	ug/g	20 / 20	9.1	120	401		0 / 20	SB-11-014B	1.8	Yes
Magnesium	ug/g	20 / 20	8,130	20,700	35,700		0 / 20	SB-11-005B	2	Yes
Manganese	ug/g	20 / 20	160	640	649		0 / 20	SB-11-009B	2.3	No
Nickel	ug/g	20 / 20	8.2	33	33		0 / 20	SB-11-014B	1.8	No
Potassium	ug/g	20 / 20	209	4,250	6,751		0 / 20	SB-11-001B	2	No
Sodium	ug/g	20 / 20	528	5,600	5,610		0 / 20	SB-11-006B	2.2	No
Vanadium	ug/g	20 / 20	7.9	26	55		0 / 20	SB-11-006B	2.2	No
Zinc	ug/g	20 / 20	29	211	385		0 / 20	SB-11-014B	1.8	No
Organics										
Toluene	ug/g	8 / 20	0.0011	0.0025	0.0		8 / 8	SB-11-012B	2.2	Yes
Trichlorofluoromethane	ug/g	9 / 20	0.0067	0.026	0.0		9 / 9	SB-11-018B	2.2	Yes

* 95% UTL is presented in log-space. In order to conduct an accurate comparison, take the natural log of the maximum concentration before comparing to the 95% UTL.

[a] For the proportion of detects, counts were based on the unaveraged data set.

[1] Surface samples are collected within the range of 0 to 0.5 feet BLS.

[2] Subsurface samples are collected within the range of >0.5 feet BLS.

Table 6-7. Data Summary Table: Groundwater - SWMU 11
Deseret Chemical Depot, Tooele, Utah

Site ID			S-3		S-3		S-3		S-45-90		S-46-90		S-46-90		S-74-90
Field Sample Number			120899		SAIC05		SAIC05D		SAIC04		120899		SAIC04		120799
Site Type			WELL		WELL		WELL		WELL		WELL		WELL		WELL
Collection Date			12/8/99		11/17/98		11/17/98		11/18/98		12/8/99		11/18/98		12/7/99
Depth (ft)			0.00		40.00		40.00		28.00		0.00		28.00		0.00
Associated Field QC Sample - Site Id															
Associated Field QC Sample - Field Sample No.															
Associated Field QC Sample - Site Id															
Associated Field QC Sample - Field Sample No.															
Metals (6010)															
Laboratory Id Number					DCDW1*13		DCDW1*14		DCDW1*17				DCDW1*15		
Parameter	Units	RL													
Aluminum	ug/L	200	N/A	LT	24.0 B+		40.1 DB+		24.8 B+		N/A		115 B+		N/A
Arsenic	ug/L	5	N/A		30.7		32.1 D		27.4		N/A		19.1		N/A
Barium	ug/L	20	N/A		25.2		25.3 D		35.4		N/A		33.7		N/A
Calcium	ug/L	100	N/A		340000		337000 D		551000		N/A		387000		N/A
Iron	ug/L	50	N/A	LT	36.8	LT	36.8 D	LT	36.8		N/A		125		N/A
Lead	ug/L	3	N/A	LT	1.00	LT	1.00 D	LT	1.00		N/A		3.33		N/A
Magnesium	ug/L	100	N/A		605000		631000 D		666000		N/A		684000		N/A
Potassium	ug/L	3000	N/A		39600		39400 D		24900		N/A		25900		N/A
Selenium	ug/L	5	N/A		40.5 S		41.3 DS		106 S		N/A		41.3 S		N/A
Sodium	ug/L	200	N/A		1920000		1980000 D		1480000		N/A		2490000		N/A
Vanadium	ug/L	50	N/A	LT	4.69		7.61 D		10.2		N/A		6.50		N/A
Semivolatiles (8270)															
Laboratory Id Number					DCDW1*13				DCDW1*17				DCDW1*15		
Parameter	Units	RL													
Dimethyl Phthalate	ug/L	5	160		500 G+		N/A		200 G+		92.0		300 G+		40.0
di-N-Butyl Phthalate	ug/L	5	LT 40.0	LT	3.70		N/A	LT	3.70 B+	LT	10.0	LT	3.70	LT	10.0
Volatiles (8260)															
Laboratory Id Number					DCDW1*13				DCDW1*17				DCDW1*15		
Parameter	Units	RL													
Methylene Chloride	ug/L	5	LT 10.0	LT	2.30		N/A	LT	2.30	LT	10.0	LT	2.30		0.700

Boolean Codes:
- LT - Less than the certified reporting limit
- ND - Not detected

Footnotes:
- CRL - Certified reporting limits
- ID - Identification
- N/A - Not applicable
- TICs - Tentatively Identified Compound

Flagging Codes:
- + - Indicates that the concentration detected in a sample is less than 5 to 10 that detected in t
- B - Analyte found in the method blank or QC blank
- D - Duplicate analysis.
- G - Analyte found in rinse blank as well as in sample.
- S - Non-target compound analyzed for and detected (GC/MS methods).

Qualifiers:
- J - Analyte was positively identified; the associated numerical value is th

Table 6-7. Data Summary Table: Groundwater - SWMU 11 (Continued)
Deseret Chemical Depot, Tooele, Utah

Site ID			S-74-90		S-75-90		S-75-90
Field Sample Number			SAIC04		120899		SAIC04
Site Type			WELL		WELL		WELL
Collection Date			11/18/98		12/8/99		11/18/98
Depth (ft)			26.00		0.00		24.00
Associated Field QC Sample - Site Id							
Associated Field QC Sample - Field Sample No.							
Associated Field QC Sample - Site Id							
Associated Field QC Sample - Field Sample No.							
Metals (6010)							
Laboratory Id Number			DCDW1*18				DCDW1*19
Parameter	Units	RL					
Aluminum	ug/L	200	**26.3** B+		N/A	LT	23.5
Arsenic	ug/L	5	**23.6**		N/A		**6.95**
Barium	ug/L	20	**36.1**		N/A		**38.1**
Calcium	ug/L	100	**267000**		N/A		**139000**
Iron	ug/L	50	LT 36.8		N/A	LT	36.8
Lead	ug/L	3	**1.19**		N/A		**1.63**
Magnesium	ug/L	100	**456000**		N/A		**208000**
Potassium	ug/L	3000	**22500**		N/A		**4890**
Selenium	ug/L	5	**25.5** S		N/A		**22.2** S
Sodium	ug/L	200	**1100000**		N/A		**553000**
Vanadium	ug/L	50	**12.7**		N/A	LT	**4.69**
Semivolatiles (8270)							
Laboratory Id Number			DCDW1*18				DCDW1*19
Parameter	Units	RL					
Dimethyl Phthalate	ug/L	5	**300** G+		**34.0**		**300** G+
di-N-Butyl Phthalate	ug/L	5	LT 3.70		**1.00** J	LT	3.70
Volatiles (8260)							
Laboratory Id Number			DCDW1*18				DCDW1*19
Parameter	Units	RL					
Methylene Chloride	ug/L	5	LT 2.30	LT	10.0	LT	2.30

Created on: 12/19/00

Table 6-8. Summary of Chemicals Detected in Groundwater at SWMU 11
Deseret Chemical Depot, Tooele, Utah

Chemical	Units	Proportion of Detects All Samples[a]	Detects Minimum	Detects Maximum	95% UTL of Background Data Set	Proportion of Detected Results Greater Than Background UTL	Maximum Concentration Location	Maximum Concentration Depth	COPC?
Inorganics									
Aluminum	µg/L	9 / 15	296	20,600	0.0	9 / 9	S-75-90	20	Yes
Antimony	µg/L	2 / 25	6.5	48	19	1 / 2	S-74-90	28	Yes
Arsenic	µg/L	25 / 25	3.1	61	28	7 / 25	S-46-90	23.5	Yes
Barium	µg/L	15 / 16	21	184	200	0 / 15	S-75-90	20	No
Cadmium	µg/L	1 / 25	4.6	4.6	11	0 / 1	S-75-90	24	No
Calcium	µg/L	15 / 15	1,380	551,000	0.0	15 / 15	S-45-90	28	Yes
Chloride	µg/L	5 / 6	1.1E+06	9.5E+06	1.4E+06	4 / 5	S-46-90	27	Yes
Chromium	µg/L	6 / 25	36	75	36	6 / 6	S-46-90	18	Yes
Copper	µg/L	8 / 25	11	35	48	0 / 8	S-45-90	27	No
Iron	µg/L	10 / 15	125	25,800	0.0	10 / 10	S-75-90	20	Yes
Lead	µg/L	19 / 25	1.2	72	58	1 / 19	S-75-90	24	Yes
Magnesium	µg/L	14 / 15	165,000	684,000	0.0	14 / 14	S-46-90	28	Yes
Manganese	µg/L	8 / 15	13	628	0.0	8 / 8	S-75-90	20	Yes
Mercury	µg/L	2 / 24	0.35	0.41	0.0	2 / 2	S-74-90	28	Yes
Nickel	µg/L	6 / 25	41	83	45	4 / 6	S-75-90	24	Yes
Nitrite, Nitrate	µg/L	1 / 2	350	350	5,600	0 / 1	S-3	35	No
Potassium	µg/L	14 / 15	4,890	39,800	0.0	14 / 14	S-3	40	Yes
Selenium	µg/L	15 / 25	3.4	106	0.0	15 / 15	S-45-90	28	Yes
Silver	µg/L	2 / 25	0.18	0.75	2.3	0 / 2	S-3	33.8	No
Sodium	µg/L	24 / 24	701	2.49E+06	61,000	23 / 24	S-46-90	28	Yes
Sulfate	µg/L	1 / 1	840,000	840,000	0.0	1 / 1	S-3	33.8	Yes
Thallium	µg/L	2 / 25	2.7	121	0.0	2 / 2	S-3	23.6	Yes
Vanadium	µg/L	4 / 15	6.5	48	0.0	4 / 4	S-75-90	20	Yes
Zinc	µg/L	10 / 25	20	226	1,200	0 / 10	S-45-90	27	No
Organics									
2,4,6-Trinitrotoluene	µg/L	1 / 16	3.3	3.3	0.0	1 / 1	S-3	33.8	Yes
Butyl Benzyl Phthalate	µg/L	2 / 25	2.0	10.0	0.0	2 / 2	S-75-90	24	Yes
Chloroform	µg/L	1 / 25	0.69	0.69	0.0	1 / 1	S-74-90	22	Yes
Dimethyl Phthalate	µg/L	14 / 28	3.7	160	0.0	14 / 14	S-3	0	Yes
Methylene Chloride	µg/L	3 / 26	0.70	6.2	0.0	3 / 3	S-46-90	23.5	Yes
di-N-Butyl Phthalate	µg/L	2 / 25	1.00	1.00	0.0	2 / 2	S-75-90	0	Yes

* 95% UTL is presented in log-space. In order to conduct an accurate comparison, take the natural log of the maximum concentration before comparing to the 95% UTL.

[a] For the proportion of detects, counts were based on the unaveraged data set.

[1] Surface samples are collected within the range of 0 to 0.5 feet BLS.

[2] Subsurface samples are collected within the range of >0.5 feet BLS.

Table 6-9. Chemicals of Potential Concern in Soil at SWMU 11
Chemical Munitions Storage Area
Deseret Chemical Depot, Tooele, Utah

Metals	VOCs/SVOCs
Surface Soil (0 to 0.5 feet BLS)	
Magnesium	Dimethyl Phthalate
Manganese	Fluoranthene
	Pyrene
	Toluene
	Trichlorofluoromethane
Subsurface Soil (0.5 to 15 feet BLS)	
Lead	Toluene
Magnesium	Trichlorofluoromethane

Table 6-10. Chemicals of Potential Concern in Groundwater at SWMU 11
Chemical Munitions Storage Area
Deseret Chemical Depot, Tooele, Utah

Metals	VOCs/SVOCs	Explosives
Aluminum	Butyl Benzyl Phthalate	2,4,6-Trinitrotoluene
Antimony	Chloroform	
Arsenic	Dimethyl Phthalate	
Calcium	Methylene Chloride	
Chloride	di-N-Butyl Phthalate	
Chromium		
Iron		
Lead		
Magnesium		
Manganese		
Mercury		
Nickel		
Potassium		
Selenium		
Sodium		
Sulfate		
Thallium		
Vanadium		

Table 6-11. RME Risk Characterization Summary: SWMU 11 - Chemical Munitions Storage Area Group 3 Phase II RFI, DCD, Tooele, Utah

Medium	Exposure Route	Current/Future Land Use		Future Land Use							
		Noncancer HI	Cancer Risk	Noncancer HI						Cancer Risk	
		Depot Worker	Depot Worker	Resident Child	Resident Adult		Construction Worker		Resident Integrated	Construction Worker	
Surface Soil (0 to 0.5 ft BLS)	Ingestion	2E-02 B	0E+00 B	3E-01 B	3E-02 B		2E-02 B		0E+00 B	0E+00 B	
	Dermal Contact	0E+00 B	0E+00 B	0E+00 B	0E+00 B		0E+00 B		0E+00 B	0E+00 B	
	Inhalation (Dust)	8E-03 B	0E+00 B	3E-02 B	1E-02 B		2E-03 B		0E+00 B	0E+00 B	
	Inhalation (Volatiles)	1E-06 B	0E+00 B	4E-06 B	2E-06 B		5E-08 B		0E+00 B	0E+00 B	
Subsurface Soil (>0.5 to 15 ft BLS)	Ingestion	NA	NA	8E-07 B	8E-08 B		2E-08 B		0E+00 B	0E+00 B	
	Dermal Contact	NA	NA	0E+00 B	0E+00 B		0E+00 B		0E+00 B	0E+00 B	
	Inhalation (Dust)	NA	NA	7E-11 B	3E-11 B		1E-12 B		0E+00 B	0E+00 B	
	Inhalation (Volatiles)	NA	NA	6E-06 B	2E-06 B		5E-08 B		0E+00 B	0E+00 B	
Groundwater	Ingestion	NA	NA	4E+01 E	2E+01 E		NA		6E-04 E	NA	
	Dermal Contact	NA	NA	8E-02 B	5E-02 B		NA		2E-06 E	NA	
	Inhalation	NA	NA	6E-01 B	1E-01 B		NA		7E-07 B	NA	
Surface Soil and Groundwater											
Combined Hazard Index (HI):		3E-02 B		4E+01 E	2E+01 E		2E-02 B				
Combined Cancer Risk:			0E+00 B						6E-04 E	0E+00 B	
Subsurface Soil and Groundwater											
Combined Hazard Index (HI):		NA		4E+01 E	2E+01 E		8E-08 B				
Combined Cancer Risk:			NA						6E-04 E	0E+00 B	

NA - pathway not evaluated
0E+00 - pathway evaluated but no risks could be calculated due to lack of EPA-approved toxicity values
B - HI ≤ 1 or ELCR ≤ 10^{-6} for the residential scenario; HI ≤ 1 or ELCR ≤ 10^{-4} for the worker scenarios
E - HI > 1 or ELCR > 10^{-6} for the residential scenario; HI > 1 or ELCR > 10^{-4} for the worker scenarios
Integrated receptor combines both child and adult exposures

Table 6-12. RME Risk Characterization Summary for Produce and Beef: SWMU 11 - Chemical Munitions Storage Area Group 3 Phase II RFI, DCD, Tooele, Utah

Medium	Exposure Route	Future Land Use					
		Noncancer HI				Cancer Risk	
		Resident Child		Resident Adult		Resident Integrated	
Produce Surface Soil (0 to 0.5 ft BLS)	Leafy Vegetable Ingestion	1E+01	E	4E+00	E	0E+00	B
	Tuberous Vegetable Ingestion	6E+00	E	2E+00	E	0E+00	B
	Fruit Ingestion	2E+00	E	6E-01	B	0E+00	B
Produce Subsurface Soil (>0.5 to 15 ft BLS)	Leafy Vegetable Ingestion	3E-10	B	1E-10	B	0E+00	B
	Tuberous Vegetable Ingestion	3E-05	B	1E-05	B	0E+00	B
	Fruit Ingestion	8E-06	B	3E-06	B	0E+00	B
Beef	Ingestion	5E-02	B	2E-02	B	0E+00	B
Produce (Surface Soil) and Beef							
Combined Hazard Index (HI):		2E+01	E	7E+00	E		
Combined Cancer Risk:						0E+00	B
Produce (Subsurface Soil) and Beef							
Combined Hazard Index (HI):		5E-02	B	2E-02	B		
Combined Cancer Risk:						0E+00	B

NA - pathway not evaluated
0E+00 - pathway evaluated but no risks could be calculated due to lack of EPA-approved toxicity values
B - HI ≤ 1 or ELCR ≤ 10^{-6} for the residential scenario; HI ≤ 1 or ELCR ≤ 10^{-4} for the worker scenarios
E - HI > 1 or ELCR > 10^{-6} for the residential scenario; HI > 1 or ELCR > 10^{-4} for the worker scenarios
Integrated receptor combines both child and adult exposures

Table 6-13. Chemicals of Concern for RME Risks at SWMU 11 - Chemical Munitions Storage Area Group 3 Phase II RFI, DCD, Tooele, Utah

Medium	Exposure Route	COC[a]	% of Total HI	% of Total Cancer Risk	Current Land Use		Future Land Use				
					Noncancer HI: Depot Worker	Cancer Risk: Depot Worker	Noncancer HI			Cancer Risk	
							Resident Child	Resident Adult	Construction Worker	Resident Integrated	Construction Worker
Surface Soil (0 to 0.5 ft BLS)	Ingestion Dermal Contact Inhalation (Dust) Inhalation (Volatiles)										
Subsurface Soil (>0.5 to 15 ft BLS)	Ingestion Dermal Contact Inhalation (Dust) Inhalation (Volatiles)										
Groundwater	Ingestion	Antimony	10%				4E+00	2E+00			
		Arsenic	16%	100%			6E+00	2E+00		6E-04	
		Iron	6%				2E+00	9E-01			
		Thallium	63%				2E+01	1E+01			
	Dermal Contact Inhalation	Arsenic	15%	99%						2E-06	

[a] COCs are chemicals which contribute to a pathway with HI > 1 and ELCR > 10^{-6} for the residential scenario and HI > 1 and ELCR > 10^{-4} for the worker scenarios
A blank space indicates a pathway not analyzed or an analyte which is not a COC for that pathway
Integrated receptor combines both child and adult exposures

Table 6-14. Chemicals of Concern for Produce and Beef RME Risks at SWMU 11 - Chemical Munitions Storage Area Group 3 Phase II RFI, DCD, Tooele, Utah

Medium	Exposure Route	COC[a]	% of Total HI	% of Total Cancer Risk	Future Land Use		
					Noncancer HI		Cancer Risk
					Resident Child	Resident Adult	Resident Integrated
Produce (Surface Soil)	Leafy Vegetable Ingestion	Manganese	100%		1E+01	4E+00	
	Tuberous Vegetable Ingestion	Manganese	100%		6E+00	2E+00	
	Fruit Ingestion	Manganese	100%		2E+00	6E-01	
Produce (Subsurface Soil)	Leafy Vegetable Ingestion						
	Tuberous Vegetable Ingestion						
	Fruit Ingestion						
Beef	Ingestion						

[a] COCs are chemicals which contribute to a pathway with HI > 1 and ELCR > 10^{-6} for the residential scenario and HI > 1 and ELCR > 10^{-4} for the worker scenarios
A blank space indicates a pathway not analyzed or an analyte which is not a COC for that pathway
Integrated receptor combines both child and adult exposures

Table 6-15. Occurrence, Distribution, and Selection of Ecological Chemicals of Potential Concern (ecoCOPCs) for Surface Soils (0-0.5 ft BLS) at SWMU 11
Deseret Chemical Depot, Tooele, Utah

Run Time: 11:51:39 AM
Run Date: 12/1/00
Exposure Unit: 11__SS1

Chemical	Frequency of Detection [a]	Number of Samples in Mean [b]	Range of Detection Limits	Range of Detected Concentrations	Units	Location of Maximum Concentration	Arithmetic Mean [b]	Site EPC [b,c]	Concentration Used for Screening [d]	Ecological Toxicity Screening Value [e]	Exceeds Ecological Screening Value Y/N [f]	Background Screening Status [g]	ecoCOPC Y/N [h]
Aluminum	19 / 19	19	-- - --	4,270 - 10,600	ug/g	SB-11-010A	6,813	7,476	10,600	NA	--	[<bk]	N
Arsenic	19 / 19	19	-- - --	4.1 - 16	ug/g	SB-11-017A	7.2	8.4	16	5.7	Y	[<bk]	N
Barium	19 / 19	19	-- - --	84 - 183	ug/g	SB-11-002A	131	144	183	1.0	Y	[<bk]	N
Beryllium	7 / 19	19	0.50 - 0.50	0.67 - 0.97	ug/g	SB-11-004A	0.46	0.62	0.97	1.1	N	[<bk]	N
Cadmium	7 / 19	19	0.70 - 0.70	0.97 - 1.5	ug/g	SB-11-004A	0.67	0.91	1.5	0.0022	Y	[<bk]	N
Calcium	19 / 19	19	-- - --	67,000 - 120,000	ug/g	SB-11-018A	87,895	94,413	120,000	NA	--	[<bk]	N
Chromium	19 / 19	19	-- - --	5.5 - 17	ug/g	SB-11-010A	11	12	17	0.40	Y	[<bk]	N
Cobalt	19 / 19	19	-- - --	3.5 - 6.3	ug/g	SB-11-004A	5.0	5.3	6.3	0.14	Y	[<bk]	N
Copper	19 / 19	19	-- - --	9.9 - 31	ug/g	SB-11-018A	16	18	31	0.31	Y	[<bk]	N
Iron	19 / 19	19	-- - --	3,690 - 13,800	ug/g	SB-11-010A	8,979	9,946	13,800	NA	--	[<bk]	N
Lead	19 / 19	19	-- - --	14 - 53	ug/g	SB-11-004A	31	36	53	0.054	Y	[<bk]	N
Magnesium	19 / 19	19	-- - --	9,170 - 21,500	ug/g	SB-11-005A	14,609	15,955	21,500	NA	--	Above	Y
Manganese	19 / 19	19	-- - --	338 - 588	ug/g	SB-11-004A	465	496	588	NA	--	Above	Y
Nickel	19 / 19	19	-- - --	9.8 - 25	ug/g	SB-11-010A	16	18	25	14	Y	[<bk]	N
Potassium	19 / 19	19	-- - --	1,020 - 4,010	ug/g	SB-11-001A	2,529	2,857	4,010	NA	--	[<bk]	N
Silver	2 / 19	19	0.59 - 0.59	0.71 - 1.3	ug/g	SB-11-016A	0.37	0.42	1.3	4.0	N	[<bk]	N
Sodium	19 / 19	19	-- - --	555 - 2,680	ug/g	SB-11-017A	1,099	1,314	2,680	NA	--	[<bk]	N
Vanadium	19 / 19	19	-- - --	7.4 - 24	ug/g	SB-11-010A	15	17	24	1.6	Y	[<bk]	N
Zinc	19 / 19	19	-- - --	34 - 2,170	ug/g	SB-11-004A	178	183	2,170	6.6	Y	[<bk]	N
Dimethyl Phthalate	1 / 13	13	0.17 - 0.80	0.70 - 0.70	ug/g	SB-11-006A	0.23	0.38	0.70	734	N	--	N
Fluoranthene	1 / 13	13	0.068 - 0.30	1.00 - 1.00	ug/g	SB-11-002A	0.13	0.23	1.00	122	N	--	N
Pyrene	1 / 13	13	0.033 - 0.20	1.00 - 1.00	ug/g	SB-11-002A	0.11	0.22	1.00	79	N	--	N
Toluene	7 / 19	19	0.00078 - 0.0020	0.00089 - 0.0066	ug/g	SB-11-012A	0.0014	0.0022	0.0066	5.5	N	--	N
Trichlorofluoromethane	6 / 19	19	0.0059 - 0.051	0.0066 - 0.015	ug/g	SB-11-004A	0.0077	0.012	0.015	16	N	--	N

-- Not applicable (e.g., background comparison not conducted for organic compounds, or screening values not available)

[a] For the Frequency of Detection, counts were based on the unaveraged data set.

[b] Results of duplicate analyses were averaged and nondetects were treated as one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

[c] The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value. If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

[d] The maximum detected concentration at the site was used for the screen.

[e] Ecological toxicity screening value is the EPA Region V RCRA ecological data quality level (EDQL). See Section 4.2.3.3 for further discussion.

[f] Maximum detected concentration compared to the screening value.

[g] For inorganics, if the analysis of variance determines that the site data are from the same population as the background data, [<bk] appears in the column. If not, "Above" appears in the column.

[h] If the maximum concentration was above the screening value and the site concentration was determined to be above background by ANOVA, the chemical was identified as an ecoCOPC. If only one value was available (screening or background) and the site maximum exceeded that value or if the site concentration was determined to be above background by ANOVA, the chemical was retained as an ecoCOPC. If neither a screening value nor background concentration was available, the chemical was selected as an ecoCOPC.

NA = Not Available.

Table 6-16. Occurrence, Distribution, and Selection of Ecological Chemicals of Potential Concern (ecoCOPCs) for Subsurface Soils (>0.5-15 ft BLS) at SWMU 11 Deseret Chemical Depot, Tooele, Utah

Run Time: 11:51:39 AM
Run Date: 12/1/00
Exposure Unit: 11__SS1

Chemical	Frequency of Detection [a]	Number of Samples in Mean [b]	Range of Detection Limits	Range of Detected Concentrations	Units	Location of Maximum Concentration	Arithmetic Mean [b]	Site EPC [b,c]	Concentration Used for Screening [d]	Ecological Toxicity Screening Value [e]	Exceeds Ecological Screening Value Y/N [f]	Background Screening Status [g]	ecoCOPC Y/N [h]
Aluminum	20 / 20	20	-- - --	2,180 - 12,800	ug/g	SB-11-009B	6,588	7,771	12,800	NA	--	[<bk]	N
Arsenic,	20 / 20	20	-- - --	4.0 - 13	ug/g	SB-11-008B	8.1	9.2	13	5.7	Y	[<bk]	N
Barium	20 / 20	20	-- - --	30 - 297	ug/g	SB-11-007B	103	139	297	1.0	Y	[<bk]	N
Beryllium	10 / 20	20	0.50 - 0.50	0.74 - 1.3	ug/g	SB-11-003B	0.60	0.87	1.3	1.1	Y	[<bk]	N
Cadmium	14 / 20	20	0.70 - 0.70	0.90 - 2.7	ug/g	SB-11-014B	1.0	1.4	2.7	0.0022	Y	[<bk]	N
Calcium	20 / 20	20	-- - --	50,500 - 170,000	ug/g	SB-11-011B	101,770	114,306	170,000	NA	--	[<bk]	N
Chromium	20 / 20	20	-- - --	6.8 - 20	ug/g	SB-11-016B	13	14	20	0.40	Y	[<bk]	N
Cobalt	20 / 20	20	-- - --	2.1 - 7.8	ug/g	SB-11-008B	4.9	5.6	7.8	0.14	Y	[<bk]	N
Copper	20 / 20	20	-- - --	5.1 - 41	ug/g	SB-11-020B	15	19	41	0.31	Y	[<bk]	N
Iron	20 / 20	20	-- - --	4,440 - 15,800	ug/g	SB-11-009B	9,778	11,145	15,800	NA	--	[<bk]	N
Lead	20 / 20	20	-- - --	9.1 - 120	ug/g	SB-11-014B	34	44	120	0.054	Y	Above	Y
Magnesium	20 / 20	20	-- - --	8,130 - 20,700	ug/g	SB-11-005B	14,557	15,984	20,700	NA	--	Above	Y
Manganese	20 / 20	20	-- - --	160 - 640	ug/g	SB-11-009B	420	470	640	NA	--	[<bk]	N
Nickel	20 / 20	20	-- - --	8.2 - 33	ug/g	SB-11-014B	18	21	33	14	Y	[<bk]	N
Potassium	20 / 20	20	-- - --	209 - 4,250	ug/g	SB-11-001B	1,669	2,123	4,250	NA	--	[<bk]	N
Sodium	20 / 20	20	-- - --	528 - 5,600	ug/g	SB-11-008B	1,392	1,804	5,600	NA	--	[<bk]	N
Vanadium	20 / 20	20	-- - --	7.9 - 26	ug/g	SB-11-008B	16	18	26	1.6	Y	[<bk]	N
Zinc	20 / 20	20	-- - --	29 - 211	ug/g	SB-11-014B	80	103	211	6.6	Y	[<bk]	N
Toluene	8 / 20	20	0.00078 - 0.00092	0.0011 - 0.0025	ug/g	SB-11-012B	0.00087	0.0012	0.0025	5.5	N	--	N
Trichlorofluoromethane	9 / 20	20	0.0059 - 0.047	0.0067 - 0.026	ug/g	SB-11-018B	0.010	0.016	0.026	16	N	--	N

-- Not applicable (e.g., background comparison not conducted for organic compounds, or screening values not available)

[a] For the Frequency of Detection, counts were based on the unaveraged data set.

[b] Results of duplicate analyses were averaged and nondetects were treated as one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

[c] The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value. If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

[d] The maximum detected concentration at the site was used for the screen.

[e] Ecological toxicity screening value is the EPA Region V RCRA ecological data quality level (EDQL). See Section 4.2.3.3 for further discussion.

[f] Maximum detected concentration compared to the screening value.

[g] For inorganics, if the analysis of variance determines that the site data are from the same population as the background data, [<bk] appears in the column. If not, "Above" appears in the column.

[h] If the maximum concentration was above the screening value and the site concentration was determined to be above background by ANOVA, the chemical was identified as an ecoCOPC. If only one value was available (screening or background) and the site maximum exceeded that value or if the site concentration was determined to be above background by ANOVA, the chemical was retained as an ecoCOPC. If neither a screening value nor background concentration was available, the chemical was selected as an ecoCOPC.

NA = Not Available.