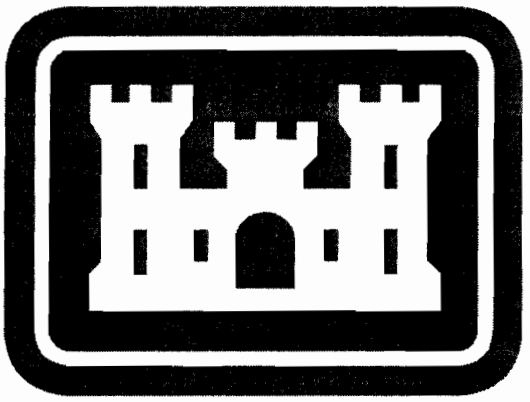
SOIL REMOVAL WORK PLAN
SCOTIA DEPOT
Scotia, New York

PREPARED FOR:



U.S. Army Corps of Engineers
Huntsville Center

Contract No. DACA87-02-D-0005

PREPARED BY:

PARSONS

AUGUST 2002

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August 2002

1.0 PURPOSE OF DOCUMENT

The purpose of this "Work Plan for Soil Removal at Scotia Depot" is to document the objective, rationale, and procedures for the soil removal at Scotia Depot. The following sections describe: the objective of the soil removal (Section 2), site history (Section 3), site setting (Section 4), previous environmental studies (Section 5), the recommended removal action (Section 6), and the post-removal sampling program (Section 7).

2.0 PROJECT OBJECTIVE

2.0.1 The northernmost portion of the Scotia Depot is no longer needed for the mission of the Defense National Stockpile Center (DNSC). Therefore, a portion of the Depot will be considered "excess" and that part of the Depot property will be returned to the owner, the General Services Administration (GSA). Figure 1 shows the location of the Scotia Depot, and indicates the portion of the property which will be returned to GSA.

2.0.2 In anticipation of releasing the property back to GSA, the DNSC conducted an environmental assessment of the Scotia Depot. That assessment included characterization of soil quality around two open storage areas; the former ferrochrome storage pad, and the former lead/zinc storage pad. The soils around these two storage areas have concentrations of metals that are above local background concentrations. The metals concentrations are not an imminent threat to human health or the environment. However, in a good-faith effort to return the property to approximately its natural condition, DNSC has decided to remove the soil around the two storage pads and replace it with native soil from elsewhere on the depot. The soil removed from around the storage pads will be disposed in a local municipal sanitary landfill. The property will then be returned to GSA. GSA will attempt to sell the property, and it is expected that the property will remain available for industrial/commercial use, in keeping with the use of the surrounding, adjacent properties.

3.0 SITE HISTORY

3.0.1 The Scotia Depot was commissioned on March 30, 1943 and was constructed in 10 months. After World War II ended, portions of the Depot were sold and converted to commercial/industrial business parks. The remaining active portion of the Depot is owned by the GSA and operated by the DNSC.

3.0.2 Several types of metals and ores at the Scotia Depot were stored in piles, either on concrete pads (e.g. ferrochrome ore) or on an asphalt surface (e.g. zinc and lead ingots). Other materials are stored in warehouses in drums, boxes, bags, etc. Figure 2 provides a current diagram of the facility, including the former locations of the ferrochrome and lead/zinc open storage areas.

3.0.3 Operations at the Scotia Depot have historically been related to the maintenance and movement of the stockpiled materials from one depot to another.

Hazardous waste materials are not routinely generated during site operations, and no on-site hazardous waste disposal has been documented. Supporting operations related to maintenance of the Depot include: building repairs and painting, vehicle repairs, maintenance and refueling, and landscaping. Thirteen people are typically on-site as permanent duty personnel assigned to Depot operations, exclusive of contracted security personnel.

4.0 SITE SETTING

4.0.1 The Scotia Depot is located on Route 5, just west of the Village of Scotia, New York. The geographic coordinates are 45° 50' 29" north latitude and 73° 59' 15" west longitude. Figure 1 shows the location of the site, and the surrounding natural and manmade features.

4.0.2 The current Depot property is approximately 59.7 acres in size (see highlighted portion of Figure 1). The Depot consists of five warehouses with a total storage capacity of 582,826 square feet, two outdoor open storage areas with a total storage capacity of 336,098 square feet, five support buildings used primarily for vehicle/equipment maintenance and repair, security, and administration (Figure 2).

4.0.3 The current Depot property is between two commercial business parks, which were originally part of the former 337-acre Scotia Navy Depot. The adjacent land use to the east and west of the Depot is commercial/industrial. Further to the east and west, the land use is mixed residential/commercial. Land use to the south of the Depot is a mixture of residential, commercial, recreational and agricultural. The Erie Canal/Mohawk River is about 2,000 feet south of the Depot. To the north of the Depot is a large sand and gravel quarry; north of the quarry the land use is primarily residential.

4.0.4 A high school and elementary school are located about 3,000 feet east of the Depot, and the nearest residence is about 200 feet south of the Depot, across Route 5. Access to the Depot is controlled by a completely-encircling fence and 24-hour security personnel. The Depot is also separated from the nearest residents and schools by the commercial/industrial business park and the quarry. Those land uses, along with Route 5, create a buffer zone around the Depot.

5.0 SUMMARY OF ENVIRONMENTAL STUDIES AT SCOTIA DEPOT

5.0.1 A Preliminary Assessment (PA) Report was completed by Parsons in December 1998 to determine what hazardous substances have been or are currently stored at the Depot, the threat posed to human health and the environment, and the need for further investigation. A Focused Site Investigation (SI) was recommended.

5.0.2 A Phase II Site Assessment Report was completed in July 1999 by PMK Group, and Edwards and Kelcey. The Phase II Site Assessment was commissioned by the GSA, owner of the Scotia Depot property. The assessment conducted by PMK Group included many of the same sampling activities originally proposed for the Focused SI by Parsons. As a result, Parsons modified the Focused SI Sampling Plan to complement the

PMK Group's Phase II Site Assessment data. The Focused SI fieldwork was completed in 1999, and a Final Focused SI Report was issued in March 2001. The Focused SI Report combined the data from the Phase II Site Assessment and the Focused SI to delineate the presence and extent of site-related impacts.

5.1 Soil Exposure Pathway Assessment

5.1.1 General

5.1.1.1 The pathway for soil exposure accounts for the potential threat to people on or near the site who may come into direct contact with exposed materials and areas of suspected contamination. Direct contact includes both ingestion and dermal exposure. The target distance limit for the soil exposure pathway, as defined by United States Environmental Protection Agency (USEPA) guidance, is 200 feet for the "resident" (or on-site worker) population and 1 mile for the nearby population.

5.1.1.2 The soil pathway was also investigated to assess the threat to groundwater. By comparing surface and subsurface soil concentrations, an assessment can be made of the presence of contamination and the potential for downward migration to the water table.

5.1.1.3 The following subsections describe the potential for releases to soil, the soil pathways and targets, the scope of work for the SI and Phase II Site Assessment, and the sampling results for the SI and Phase II Site Assessment.

5.1.2 Potential for Release to Soil

The DNSC has conducted leaching studies at other depots which demonstrate that mechanisms exist for certain metals to leach from particular types of outdoor stockpiles, and for migration of contaminated runoff to enter soil. The potential exists for a release of metals to soils at the Scotia Depot. The outdoor stockpiles of lead, zinc and ferrochrome were sources of potential soil contamination. The lead, zinc and ferrochrome stockpiles could potentially have leached contaminants during rain storms, and the runoff could flow over the concrete or asphalt pad and onto the surrounding soil.

5.1.3 Soil Pathways and Targets

No one is known to live on-site or on adjacent properties within 200 feet of the open storage areas. There are no schools, daycare facilities or other sensitive land uses within 200 feet of the property lines near the open storage areas. Therefore, there is no resident population. Approximately 13 workers are present at the Depot as full-time employees. Approximately 2,162 people (nearby population) live within one mile of the site. The nearest regularly-occupied building is onsite, and is approximately 800 feet from the open storage area. There are no sensitive environments, such as wetlands or habitats for endangered/threatened species, onsite.

5.1.4 SI and Phase II Site Assessment Scope of Work and Results

5.1.4.1 It was hypothesized in the PA and Phase II Site Assessment reports that hazardous substances could have leached from the current and former outdoor metals and

ore storage areas by exposure to precipitation, and entered the surrounding soil via infiltration.

5.1.4.2 To test the hypotheses of other suspected source area releases, the Focused SI included a surface and subsurface soil sampling and analysis program. In general, surface soil samples were collected at depths of 0 to 0.5 feet below ground surface (bgs) and analyzed to assess the direct contact exposure pathway. At most locations, subsurface soil samples were also collected at depths of 1 to 2 feet and analyzed to assess whether contaminants are migrating downward through the soil column.

5.1.4.3 In addition to samples collected around the two open storage areas, soil samples were also collected during the Focused SI to assess "background" soil quality. Eleven soil samples were collected at 8 locations to assess background soil quality in the site vicinity. Background soil sample data provide an indication of the soil quality in the site vicinity, independent of impacts from the Depot. If the soil metal concentrations at the Depot are above state regulatory criteria and exceed the range of background concentrations, it indicates there may have been impacts on soil quality due to Depot activities.

5.1.5 Lead and Zinc Open Storage Area

5.1.5.1 Studies conducted at other depots by the DNSC suggest metals can leach from the zinc and lead outdoor stockpiles. Based on those studies, it is hypothesized that the former lead and zinc stockpiles at the Scotia Depot could have leached metals to the surrounding soils. Sampling was conducted to test this hypothesis.

5.1.5.2 Fourteen soil samples (MS-1 through MS-12 and SS-3A and 3B) were collected at depths ranging from 0.5 to 2.0 feet bgs within and around the open storage area. The samples were analyzed for Target Analyte List (TAL) metals to assess the impacts of runoff from the open storage area (Figure 3). Most of the soil samples were collected from beneath the asphalt pad. Samples SS-1 and SS-2 contained fragments of the asphalt pad and were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals to assess whether constituents from the stockpiles had leached into the asphalt at levels that would constitute a hazardous waste.

5.1.5.3 The soil results for the lead/zinc open storage area do not indicate a significant impact on soil quality due to leaching or runoff of lead and zinc from the stockpile (Table 1). The two samples collected for TCLP metals (SS-1 and SS-2) both had concentrations well below the hazardous waste criteria.

5.1.5.4 Of the 14 soil samples analyzed for TAL metals, each had at least one metal at a concentration above the background range. Three metals (antimony, arsenic, and copper) were detected at concentrations above the background ranges in 11 samples. It is noteworthy that zinc concentrations were above the background range in only 5 of the 14 samples, and lead was not above the background range in any samples. The maximum concentration of zinc (137 mg/kg in MS-4) is slightly more than twice the background maximum.

5.1.6 Outdoor Ferrochrome Stockpile

5.1.6.1 Based on previous DNSC studies on leaching of metals from outdoor stockpiles, it is hypothesized that the ferrochrome stockpile at the Scotia Depot could have leached metals to the surrounding soils. Ferrochrome ore is approximately 70 percent chromium. Chromium and other trace metals within the ferrochrome stockpile may have migrated to, or been deposited in, the soil surrounding the concrete pad. To determine if runoff from the ferrochrome stockpile has deposited leached metals into the adjacent soil, ten soil samples were collected around the perimeter of the concrete pad during the Phase II Site Assessment (Figure 4).

5.1.6.2 The sample results show several metals are present at concentrations above background near the stockpile (Table 2). Arsenic and antimony exceeded the background range in all 10 of the samples. Chromium exceeded the background range in 7 of the 10 samples. However, in only one sample (MS-16) was the chromium concentration in excess of twice the background maximum. These results indicate minor impacts to soil quality which are attributable to runoff from the ferrochrome stockpile.

6.0 RECOMMENDED REMOVAL ACTION

6.0.1 This section describes the procedures for the recommended soil removal action at the former lead/zinc and ferrochrome open storages areas at Scotia Depot. DNSC has chosen to remove the soils immediately adjacent to the two storage pads as a good-faith effort to return the property to approximately its original soil-quality condition.

6.0.2 In the former lead/zinc storage area, the metals concentrations in soils beneath the asphalt pad are slightly above background concentrations. The soil quality does not pose a threat to human health or the environment. In addition, the asphalt pad acts as a cover over the soil, restricting the possibility of direct contact or migration of the soil. The removal action at the former lead/zinc storage area will consist of scraping a layer of soil/sediment off the top of the asphalt surface from around the outside perimeter of the fenced storage area. At the east end of the storage area, the edge of the asphalt pad is closer to the fenceline. In that area, the top two feet of soil will be removed. There are also several stormwater catch basins in the immediate vicinity of the open storage area. The cover grates will be removed and any sediment inside will be removed and handled with the other soils.

6.0.3 In the former ferrochrome storage area, the soils adjacent to the concrete pad have metals concentrations slightly above background concentrations. The soil quality does not pose an imminent risk to human health or the environment. However, DNSC has chosen to remove the soil in a good-faith effort to return the property to approximately its original soil-quality condition. The top two feet of soil, extending five feet out from the entire perimeter of the concrete pad, will be removed.

6.0.4 The soil/sediment from both areas will be disposed as nonhazardous solid waste in a local municipal sanitary landfill. Recent sampling results confirm that the soils are not characteristically hazardous (Attachment A).

6.0.5 The removal action at Scotia Depot will involve the excavation of approximately 600 to 900 cubic yards of soil. The removal areas will then be regraded using backfill soils as needed and seeded for long-term grass cover. The source of the backfill soils will be an undisturbed area of the Depot, which is located east of the lead/zinc open storage area.

6.0.6. Excavated soil will be deposited directly into trucks for transportation to the landfill. If necessary, the excavated soil will be staged temporarily on a plastic covered area on top of the storage pad(s). Any temporary stockpiles will be covered overnight and prior to significant rain events with flexible polyethylene cover material.

6.0.7 The primary method of excavating soil will likely be a backhoe or small excavator. Operators will be careful to not excavate asphalt with the soil to the extent possible. No other debris or nonsoil materials are expected to be encountered. Given the shallow excavation depths, groundwater will not be encountered during the removal action.

6.0.8 Worker Space Air Monitoring – Limited precautions are necessary, and are detailed in the Health and Safety Plan (Attachment B). The removal actions will be conducted in areas which are more than 300 feet from any occupied buildings or work areas. Nuisance dust will be the primary issue during the soil removal action. If dust is generated during the soil removal action, the workers will wet the soils down with water from a nearby fire hydrant to eliminate the dust.

6.0.9 Site Perimeter Air Monitoring - The removal actions will be conducted in areas which are more than 300 feet from any occupied buildings or work areas. Nuisance dust will be the primary potential issue during the soil removal action. If dust is generated during the soil removal action, the workers will wet the soils down with water from a nearby fire hydrant to eliminate the dust.

6.0.10 Real-time air monitoring for particulates or metals is not necessary; the metals concentrations in the soils are not high enough to pose a public health risk, and airborne particulates can be controlled by increasing the moisture content of the soil

7.0 POST-REMOVAL SAMPLING

7.0.1 The post-removal soil quality will be documented by collecting soil samples from the sides and bottom of the excavations and analyzing them for TAL metals. The analytical results will be reported in a Soil Removal Documentation Report. The soil to be removed is not highly impacted, so the post-removal sampling results will only be used to document the remaining soil quality, and not used to determine whether additional removal is needed.

7.0.2 Eight soil samples will be collected from the former ferrochrome storage area. From the bottom of the excavation, a soil sample will be collected at a rate of one per 50 linear feet and composited into one sample from each side of the pad, for a total of four "excavation-bottom" samples. From the sides of the excavation, a soil sample will be collected at a rate of one per 50 linear feet and composited into one sample from each side of the pad, for a total of four "excavation-sidewall" samples. These eight samples will be submitted for laboratory analysis for TAL metals, using the NYSDEC Analytical Services Protocol methods.

7.0.3 The same sampling scheme will be applied at the former lead/zinc storage area. However, sampling will only take place on the east side of the pad where soil excavation will occur. On the other three sides of the pad, the soils/sediment will be scraped off the asphalt surface, and no post-removal sampling will be necessary.

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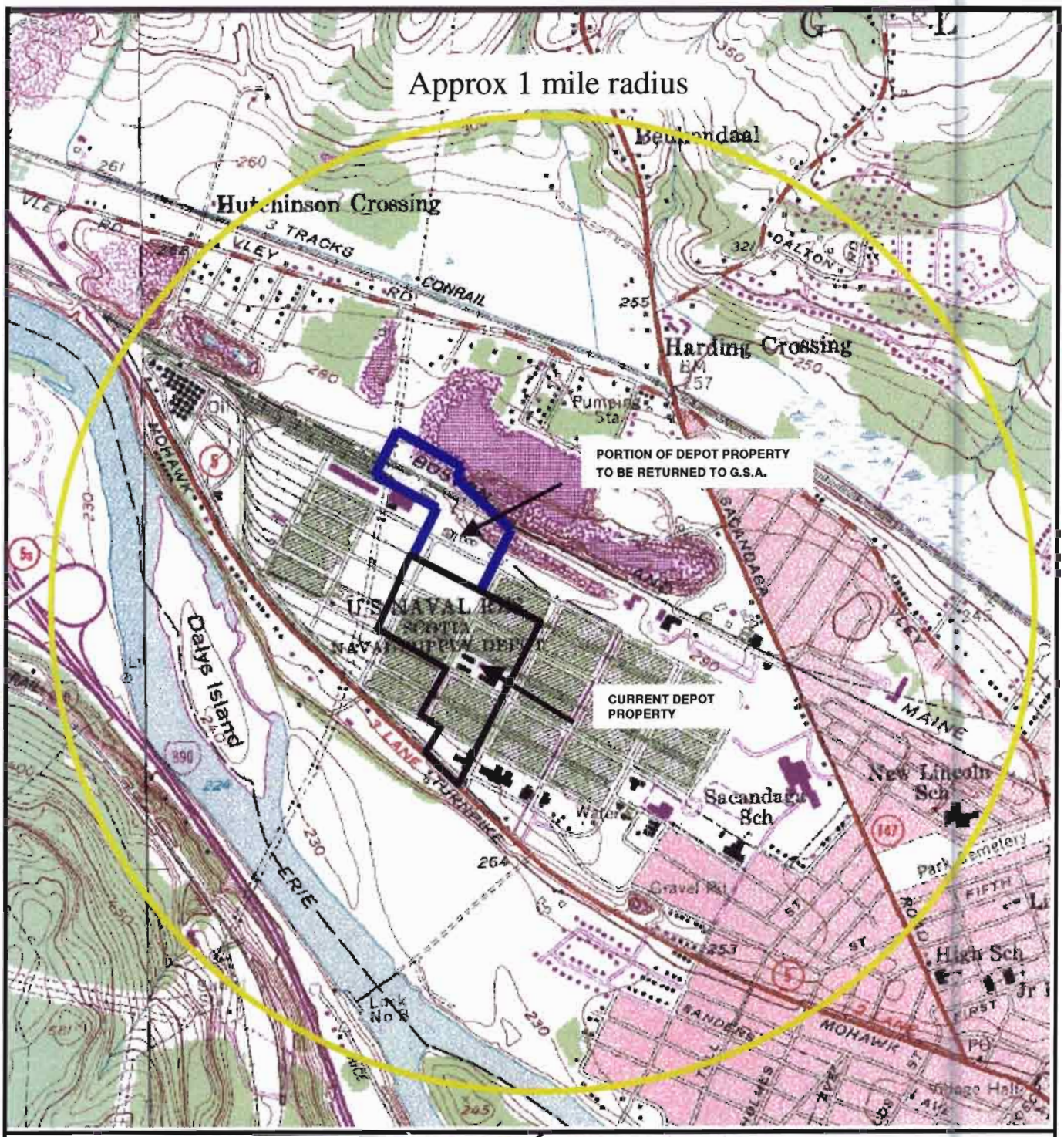

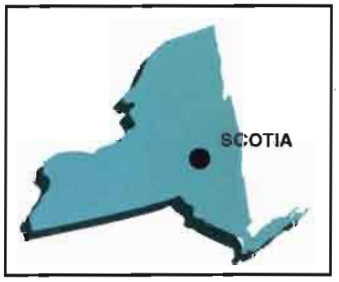

New York
Quadrangle

LATITUDE: N42° 50' 24"
LONGITUDE: W73° 59' 06"

SOURCE: DeLORME 3-D
TOPOQUAD PROGRAM

FIGURE 1

DLA/DNSC SCOTIA DEPOT
SCOTIA, NEW YORK

SITE VICINITY MAP

PARSONS
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, NY 13088 PHONE: (315) 451-9560

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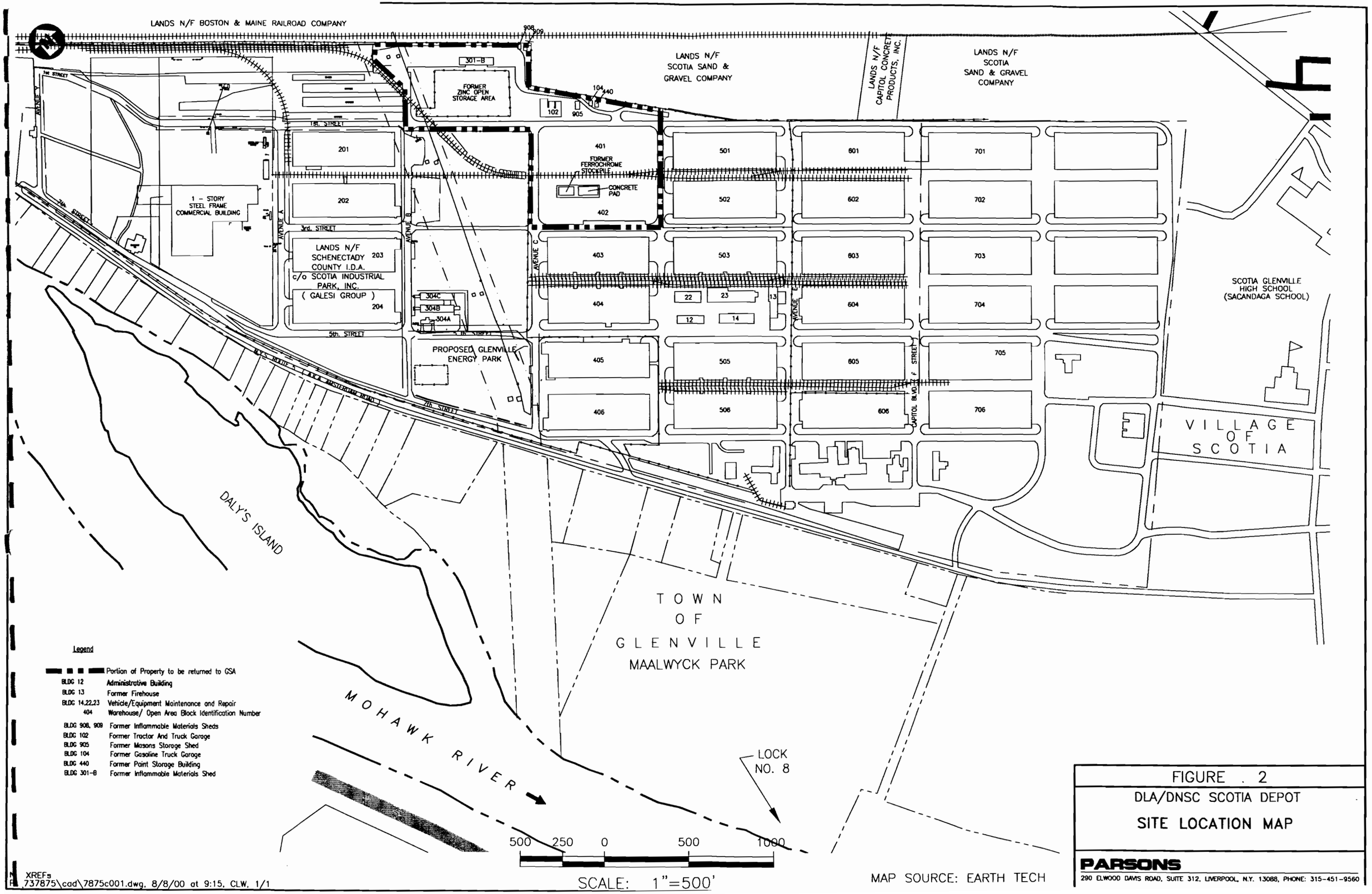

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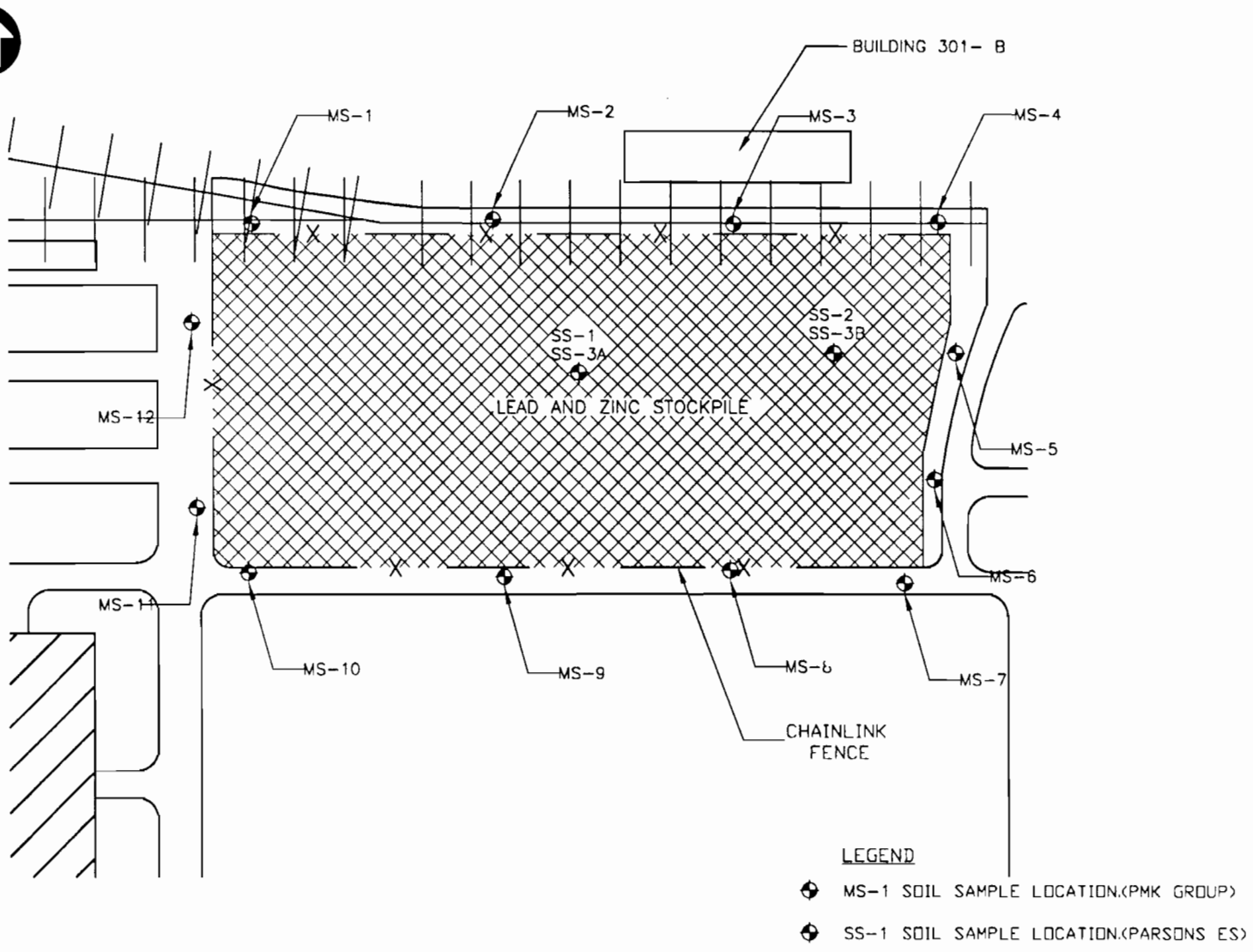
FIGURE . 2

DLA/DNSC SCOTIA DEPOT

SITE LOCATION MAP

PARSONS
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315-451-9560



LEGEND

- MS-1 SOIL SAMPLE LOCATION.(PMK GROUP)
- SS-1 SOIL SAMPLE LOCATION.(PARSONS ES)

SOURCE: PMK GROUP, 1999

FIGURE 3

DLA/DNSC SCOTIA DEPOT
LEAD/ZINC OPEN STORAGE AREA
SOIL SAMPLING LOCATIONS

PARSONS
PARSONS INFRASTRUCTURE & TECHNOLOGY GROUP INC.
PARSONS ENGINEERING SCIENCE, INC.
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315-451-9560

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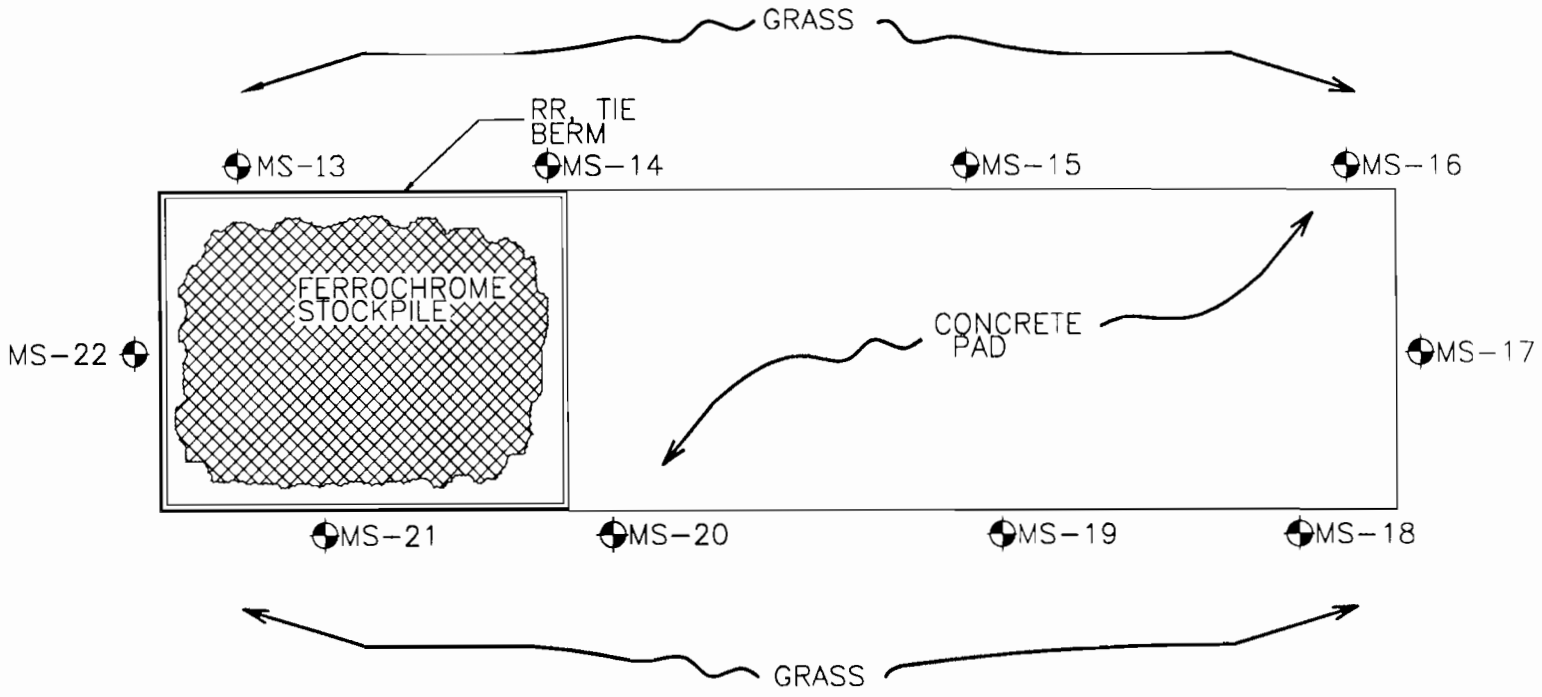

LEGEND

MS-21 SOIL SAMPLE LOCATION

SOURCE:PMK GROUP,1999

40 20 0 40 80

SCALE: 1"=40'

FIGURE 4

DLA/DNSC SCOTIA DEPOT
OUTDOOR FERROCHROME STOCKPILE
SOIL SAMPLING LOCATIONS

PARSONS
PARSONS INFRASTRUCTURE & TECHNOLOGY GROUP INC.
PARSONS ENGINEERING SCIENCE, INC.
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315-451-9560

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Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Lead Zinc Open Storage Area							
			SAMPLE ID:	MS-1	MS-2	MS-3	MS-4	MS-5	MS-6	MS-7	MS-8
			LAB ID:	100495	100496	100497	100498	100499	100500	100501	100502
			DEPTH:	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5	0.5-1.0	1.0-1.5	1.0-1.5
			SOURCE:								
			SDG:								
		Recommended Soil Cleanup Criteria	MATRIX:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			SAMPLED:	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998
			VALIDATED:								
CAS NO.	COMPOUND		UNITS:								
	VOLATILES										
74-83-9	Bromomethane	N/A	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
75-09-2	Methylene chloride	0.1	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
71-43-2	Benzene	0.06	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
156-59-2	cis-1,2-Dichloroethene	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
156-60-5	trans-1,2-Dichloroethene	0.3	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
127-18-4	Tetrachloroethene	1.4	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
108-88-3	Toluene	1.5	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
79-01-6	Trichloroethene	0.7	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
100-41-4	Ethylbenzene	5.5	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
1330-20-7	Xylene	1.2	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Total VOCs		mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	SEMIVOLATILES										
105-67-9	2,4-Dimethylphenol	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
91-57-6	2-Methylnaphthalene	36.4	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
83-32-9	Acenaphthene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
208-96-8	Acenaphthylene	41	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
120-12-7	Anthracene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
56-55-3	Benzo(a)anthracene	0.224 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
50-32-8	Benzo(a)pyrene	0.061 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
205-99-2	Benzo(b)fluoranthene	1.1	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
191-24-2	Benzo(ghi)perylene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
207-08-9	Benzo(k)fluoranthene	1.1	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
117-81-7	bis (2-Ethylhexyl) phthalate	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
86-74-8	Carbazole	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
218-01-9	Chrysene	0.4	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
53-70-3	Dibenzo(a,h)anthracene	0.014 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
132-64-9	Dibenzofuran	6.2	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
206-44-0	Fluoranthene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
86-73-7	Fluorene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	3.2	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
91-20-3	Naphthalene	13	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
87-86-5	Pentachlorophenol	1 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
85-01-8	Phenanthrene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
108-95-2	Phenol	0.03 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
129-00-0	Pyrene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Total SVOCs		mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Pesticides/PCBs										
7421-93-4	Endrin aldehyde	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Herbicides										
94-75-7	2,4-D	0.5	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA

The criteria referenced are recommended soil cleanup objectives (TAGM 4046) for organic compounds, and are the hazardous characteristic levels for TCLP (40 CFR Part 261.1)

Sample concentrations that exceed the criteria and background range are shaded

- Not Detected

NS - No Standard,

R - Rejected Value

J - Estimated Value

N - Compound is tentatively identified.

NA - Not analyzed

MDL - Method Detection Limit

TCLP BNAs - Toxicity characteristic Leaching procedure
Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Lead Zinc Open Storage Area							
		Range of Background Soil Concentrations	SAMPLE ID:	MS-1	MS-2	MS-3	MS-4	MS-5	MS-6	MS-7	MS-8
			LAB ID:	100495	100496	100497	100498	100499	100500	100501	100502
			DEPTH	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5	0.5-1.0	1.0-1.5	1.0-1.5
			SOURCE:								
			SDG:								
			MATRIX:								
			SAMPLED:	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/2/1998
CAS NO.	COMPOUND		VALIDATED								
			UNITS:								
	METALS										
7429-90-5	Aluminum	4650 - 9600	mg/Kg	7400	6610	4740	10600	6260	7080	12700	7780
7440-36-0	Antimony	0.29 - 0.49	mg/Kg	1.7	1.1	-	1.7	0.94	-	5.2	4.8
7440-38-2	Arsenic	2.7 - 6.5	mg/Kg	18.9	5.9	19.4	21.4 J	18.9	8.5	32.4	36.1
7440-39-3	Barium	21.7 - 75.4	mg/Kg	33.6	34.6	23.1	39.5	25.5	29.4	0.61	0.52
7440-41-7	Beryllium	0.26 - 0.58	mg/Kg	0.51	0.47	0.32	0.71	0.49	0.53	-	-
7440-43-9	Cadmium	0.14 - 0.29	mg/Kg	-	-	-	-	-	-	-	-
7440-70-2	Calcium	864 - 21500	mg/Kg	9800	41600	60300	7040	31900	13600	10500	15900
7440-47-3	Chromium	5.5 - 12.3	mg/Kg	10.7	11.5	7.4	14.5	8.8	10.9	14	11
7440-48-4	Cobalt	3.5 - 8.9	mg/Kg	6.2	5.3	4.5	7.2	4.8	5.4	8.3	5.9
7440-50-8	Copper	9.3 - 18.7	mg/Kg	58.8	103	56.8	303	19.8	25.5	16.5	46.4
7439-89-6	Iron	11000 - 21400	mg/Kg	18400	17400	13700	23000	16100	18800	22000	17200
7439-92-1	Lead	8.9 - 31.6	mg/Kg	23.7	16.9	7.5	17.1	10.7	12.5	13.1	12.4
7439-95-4	Magnesium	1940 - 7360	mg/Kg	5650	20000	12900	4770	6550	7310	5020	6640
7439-96-5	Manganese	225 - 619	mg/Kg	502	672	424	427	467	503	512	422
7439-97-6	Mercury	0.027 - 0.057	mg/Kg	0.06	0.04	0.02	0.02	0.03	0.03	0.03	0.02
7440-02-0	Nickel	6.8 - 15.8	mg/Kg	13.4	13.6	11.5	16.6	10.2	12.5	16.5	15.1
7440-09-7	Potassium	400 - 1230	mg/Kg	406	428	514	608	404	485	480	502
7782-49-2	Selenium	0.21 - 0.25	mg/Kg	-	-	-	-	-	-	-	-
7440-22-4	Silver	0.25	mg/Kg	-	-	-	-	-	-	-	-
7440-23-5	Sodium	59.9 - 82.4	mg/Kg	-	-	-	-	-	-	252	-
7440-62-2	Vanadium	12.3 - 22.7	mg/Kg	21.6	21.1	13.9	33.6	18.5	22.8	31.6	27
7440-66-6	Zinc	31.1 - 64.1	mg/Kg	111	59.3	64.6	137	50.8	79.5	48	56.7
57-12-5	Total Cyanide	***	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	TCLP BNAs	Regulatory Criteria									
	None Detected		mg/L	NA	NA	NA	NA	NA	NA	NA	NA
	TCLP METALS										
7440-38-2	Arsenic	5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA
7440-39-3	Barium	100	mg/L	NA	NA	NA	NA	NA	NA	NA	NA
7440-43-9	Cadmium	1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA
7440-47-3	Chromium	5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA

The criteria referenced are recommended soil cleanup objectives (TAGM 4046) for organ compounds, and are the hazardous characteristic levels for TCLP (40 CFR Part 261.1)
Sample concentrations that exceed the criteria and background range are shaded
- Not Detected
NS - No Standard,
R - Rejected Value
J - Estimated Value
N - Compound is tentatively identified
NA - Not analyzed
MDL - Method Detection Limit
TCLP BNAs - Toxicity characteristic Leaching procedure
Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Lead Zinc Open Storage Area							
		Recommended Soil Cleanup Criteria	SAMPLE ID:	MS-9	MS-10	MS-11	MS-12	SS-1	SS-2	SS-3A	SS-3B
			LAB ID:	100503	100504	100505	100506	C9L1670246-014	C9L1670246-015	C9L160246-016	C9L160246-017
			DEPTH:	1 0-1.5	0 5-1 0	0.5-1 0	0.5-1.0	0 2'	0.2'	1'	2
			SOURCE:					Quanterra	Quanterra	Quanterra	Quanterra
			SDG:					D6FKT	D6F7PT	D6F7T	D6F81
			MATRIX:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			SAMPLED:	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/15/1999	12/15/1999	12/15/1999	12/15/1999
			VALIDATED:					1/30/2000	1/30/2000	1/30/2000	1/30/2000
CAS NO.	COMPOUND		UNITS:								
	VOLATILES										
74-83-9	Bromomethane	N/A	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
75-09-2	Methylene chloride	0 1	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
71-43-2	Benzene	0 06	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
156-59-2	cis-1,2-Dichloroethene	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
156-60-5	trans-1,2-Dichloroethene	0 3	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
127-18-4	Tetrachloroethene	1 4	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
108-88-3	Toluene	1 5	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
79-01-6	Trichloroethene	0 7	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
100-41-4	Ethylbenzene	5 5	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
1330-20-7	Xylene	1 2	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Total VOCs		mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	SEMIVOLATILES										
105-67-9	2,4-Dimethylphenol	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
91-57-6	2-Methylnaphthalene	36 4	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
83-32-9	Acenaphthene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
208-96-8	Acenaphthylene	41	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
120-12-7	Anthracene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
56-55-3	Benzo(a)anthracene	0.224 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
50-32-8	Benzo(a)pyrene	0.061 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
205-99-2	Benzo(b)fluoranthene	1 1	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
191-24-2	Benzo(ghi)perylene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
207-08-9	Benzo(k)fluoranthene	1.1	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
117-81-7	bis (2-Ethylhexyl) phthalate	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
86-74-8	Carbazole	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
218-01-9	Chrysene	0.4	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
53-70-3	Dibenzo(a,h)anthracene	0 014 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
132-64-9	Dibenzofuran	6.2	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
206-44-0	Fluoranthene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
86-73-7	Fluorene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	3 2	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
91-20-3	Naphthalene	13	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
87-86-5	Pentachlorophenol	1 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
85-01-8	Phenanthrene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
108-95-2	Phenol	0.03 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
129-00-0	Pyrene	50	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Total SVOCs		mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Pesticides/PCBs										
7421-93-4	Endrin aldehyde	NS	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	Herbicides										
94-75-7	2,4-D	0 5	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA

The criteria referenced are recommended soil cleanup objectives (TAGM 4046) for organ compounds, and are the hazardous characteristic levels for TCLP (40 CFR Part 261.1)

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TCLP BNAs - Toxicity characteristic Leaching procedure
Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Lead Zinc Open Storage Area				Lead/Zinc Open Storage Area			
		Range of Background Soil Concentrations	SAMPLE ID:	MS-9	MS-10	MS-11	MS-12	SS-1	SS-2	SS-3A	SS-3B
			LAB ID:	100503	100504	100505	100506	C9L1670245-014	C9L1670246-015	C9L160246-016	C9L160245-017
			DEPTH:	1 0-1 5	0 5-1 0	0 5-1 0	0 5-1 0	0 2'	0.2'	1'	2'
			SOURCE:					Quanterra	Quanterra	Quanterra	Quanterra
			SDG:					D6FKT	D6F7PT	D6F7T	D6F81
			MATRIX:					Soil	Soil	Soil	Soil
			SAMPLED:	12/2/1998	12/2/1998	12/2/1998	12/2/1998	12/15/1999	12/15/1999	12/15/1999	12/15/1999
			VALIDATED					1/30/2000	1/30/2000	1/30/2000	1/30/2000
CAS NO.	COMPOUND		UNITS:								
	METALS										
7429-90-5	Aluminum	4650 - 9600	mg/Kg	8300	7610	6360	6660	NA	NA	6800	8490
7440-36-0	Antimony	0.29 - 0.49	mg/Kg	5.4	5.9	19.4	5.7	NA	NA	0.31 J	7.8 J
7440-38-2	Arsenic	2.7 - 6.5	mg/Kg	32	30.6	24.5	29.3	NA	NA	5 5	5.4
7440-39-3	Barium	21.7 - 75 4	mg/Kg	0.59	0.54	0.73	0.55	NA	NA	26 5	35.5
7440-41-7	Beryllium	0 26 - 0.58	mg/Kg	-	-	-	-	NA	NA	0 49 J	0 49 J
7440-43-9	Cadmium	0.14 - 0.29	mg/Kg	-	-	-	-	NA	NA	0 23 J	0.52 J
7440-70-2	Calcium	864 - 21500	mg/Kg	9470	5090	30100	16800	NA	NA	16800 J	13900 J
7440-47-3	Chromium	5.5 - 12 3	mg/Kg	12	11.3	11.1	11	NA	NA	9 J	23.4 J
7440-48-4	Cobalt	3 5 - 8.9	mg/Kg	6	6.8	5.8	5.3	NA	NA	6.4	6 7
7440-50-8	Copper	9 3 - 18.7	mg/Kg	55.8	17.6	21.3	35.1	NA	NA	21.1	15.6
7439-89-6	Iron	11000 - 21400	mg/Kg	19200	20600	21900	18400	NA	NA	18100	19600
7439-92-1	Lead	8 9 - 31.6	mg/Kg	12.4	7	8.8	15.4	NA	NA	6.9 J	8 J
7439-95-4	Magnesium	1940 - 7360	mg/Kg	4800	3500	4420	8840	NA	NA	7570	6520
7439-96-5	Manganese	225 - 619	mg/Kg	464	655	677	565	NA	NA	551 J	541 J
7439-97-6	Mercury	0 027 - 0 057	mg/Kg	0.03	0.02	0.02	0.02	NA	NA	0.036 J	0.039
7440-02-0	Nickel	6 8 - 15.8	mg/Kg	13.8	13.2	15.2	13.2	NA	NA	11.7	18
7440-09-7	Potassium	400 - 1230	mg/Kg	471	452	566	521	NA	NA	758	691
7782-49-2	Selenium	0 21 - 0 25	mg/Kg	-	-	0.94	-	NA	NA	-	-
7440-22-4	Silver	0 25	mg/Kg	-	-	-	-	NA	NA	-	-
7440-23-5	Sodium	59 9 - 82.4	mg/Kg	-	-	-	-	NA	NA	63.4 J	83.1 J
7440-62-2	Vanadium	12 3 - 22.7	mg/Kg	22.7	24.5	21	24.6	NA	NA	25.7	22.7
7440-66-6	Zinc	31.1 - 64 1	mg/Kg	53.4	43 8	51.7	55	NA	NA	63 3 J	117 J
57-12-5	Total Cyanide	***	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA
	TCLP BNAs	Regulatory Criteria									
	None Detected		mg/L	NA	NA	NA	NA	NA	NA	NA	NA
	TCLP METALS										
7440-38-2	Arsenic	5	mg/L	NA	NA	NA	NA	0.094 J	0 096 J	NA	NA
7440-39-3	Barium	100	mg/L	NA	NA	NA	NA	0.25 J	0 22 J	NA	NA
7440-43-9	Cadmium	1	mg/L	NA	NA	NA	NA	0.0066 J	0 017 J	NA	NA
7440-47-3	Chromium	5	mg/L	NA	NA	NA	NA	0.053 J	-	NA	NA

The criteria referenced are recommended soil cleanup objectives (TAGM 4046) for organ compounds, and are the hazardous characteristic levels for TCLP (40 CFR Part 261.1)

Sample concentrations that exceed the criteria and background range are shaded

- Not Detected

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R - Rejected Value

J - Estimated Value

N - Compound is tentatively identified

NA - Not analyzed

MDL - Method Detection Limit

TCLP BNAs - Toxicity characteristic Leaching procedure

Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Ferrochrome Open Storage Area			
		Recommended Soil Cleanup Criteria	SAMPLE ID:	MS-13	MS-14	MS-15	MS-16
			LAB ID:	100507	100508	100509	100510
			DEPTH:	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5
			SOURCE:				
			SDG:				
			MATRIX:	Soil	Soil	Soil	Soil
			SAMPLED:	12/3/1998	12/3/1998	12/3/1998	12/3/1998
			VALIDATED:				
CAS NO	COMPOUND		UNITS:				
	VOLATILES						
74-83-9	Bromomethane	N/A	mg/Kg	NA	NA	NA	NA
75-09-2	Methylene chloride	0.1	mg/Kg	NA	NA	NA	NA
71-43-2	Benzene	0.06	mg/Kg	NA	NA	NA	NA
156-59-2	cis-1,2-Dichloroethene	NS	mg/Kg	NA	NA	NA	NA
156-60-5	trans-1,2-Dichloroethene	0.3	mg/Kg	NA	NA	NA	NA
127-18-4	Tetrachloroethene	1.4	mg/Kg	NA	NA	NA	NA
108-88-3	Toluene	1.5	mg/Kg	NA	NA	NA	NA
79-01-6	Trichloroethene	0.7	mg/Kg	NA	NA	NA	NA
100-41-4	Ethylbenzene	5.5	mg/Kg	NA	NA	NA	NA
1330-20-7	Xylene	1.2	mg/Kg	NA	NA	NA	NA
	Total VOCs		mg/Kg	NA	NA	NA	NA
	SEMIVOLATILES						
105-67-9	2,4-Dimethylphenol	NS	mg/Kg	NA	NA	NA	NA
91-57-6	2-Methylnaphthalene	36.4	mg/Kg	NA	NA	NA	NA
83-32-9	Acenaphthene	50	mg/Kg	NA	NA	NA	NA
208-96-8	Acenaphthylene	41	mg/Kg	NA	NA	NA	NA
120-12-7	Anthracene	50	mg/Kg	NA	NA	NA	NA
56-55-3	Benzo(a)anthracene	0.224 or MDL	mg/Kg	NA	NA	NA	NA
50-32-8	Benzo(a)pyrene	0.061 or MDL	mg/Kg	NA	NA	NA	NA
205-99-2	Benzo(b)fluoranthene	1.1	mg/Kg	NA	NA	NA	NA
191-24-2	Benzo(ghi)perylene	50	mg/Kg	NA	NA	NA	NA
207-08-9	Benzo(k)fluoranthene	1.1	mg/Kg	NA	NA	NA	NA
117-81-7	bis (2-Ethylhexyl) phthalate	50	mg/Kg	NA	NA	NA	NA
86-74-8	Carbazole	NS	mg/Kg	NA	NA	NA	NA
218-01-9	Chrysene	0.4	mg/Kg	NA	NA	NA	NA
53-70-3	Dibenzo(a,h)anthracene	0.014 or MDL	mg/Kg	NA	NA	NA	NA
132-64-9	Dibenzofuran	6.2	mg/Kg	NA	NA	NA	NA
206-44-0	Fluoranthene	50	mg/Kg	NA	NA	NA	NA
86-73-7	Fluorene	50	mg/Kg	NA	NA	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	3.2	mg/Kg	NA	NA	NA	NA
91-20-3	Naphthalene	13	mg/Kg	NA	NA	NA	NA
87-86-5	Pentachlorophenol	1 or MDL	mg/Kg	NA	NA	NA	NA
85-01-8	Phenanthrene	50	mg/Kg	NA	NA	NA	NA
108-95-2	Phenol	0.03 or MDL	mg/Kg	NA	NA	NA	NA
129-00-0	Pyrene	50	mg/Kg	NA	NA	NA	NA
	Total SVOCs		mg/Kg	NA	NA	NA	NA
	Pesticides/PCBs						
7421-93-4	Endrin aldehyde	NS	mg/Kg	NA	NA	NA	NA
	Herbicides						
94-75-7	2,4-D	0.5	mg/Kg	NA	NA	NA	NA

The criteria referenced are recommended soil cleanup objectives (TAGM 4046) for organ
Sample concentrations that exceed the criteria and background range are shaded

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TCLP BNAs - Toxicity characteristic Leaching procedure

Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Ferrochrome Open Storage Area			
		Range of Background Soil Concentrations	SAMPLE ID:	MS-13	MS-14	MS-15	MS-16
			LAB ID:	100507	100508	100509	100510
			DEPTH:	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5
			SOURCE:				
			SDG:				
			MATRIX:				
			SAMPLED:	12/3/1998	12/3/1998	12/3/1998	12/3/1998
CAS NO.	COMPOUND		VALIDATED:				
			UNITS:				
	METALS						
7429-90-5	Aluminum	4650 - 9600	mg/Kg	4750	8960	8270	7080
7440-36-0	Antimony	0.29 - 0.49	mg/Kg	3.2	4.7	4.4	3.6
7440-38-2	Arsenic	2.7 - 6.5	mg/Kg	21.2	38.3	36.8	43.4
7440-39-3	Barium	21.7 - 75.4	mg/Kg	0.31	0.47	0.47	0.41
7440-41-7	Beryllium	0.26 - 0.58	mg/Kg	-	-	-	-
7440-43-9	Cadmium	0.14 - 0.29	mg/Kg	-	-	-	-
7440-70-2	Calcium	864 - 21500	mg/Kg	33400	4530	6260	2540
7440-47-3	Chromium	5.5 - 12.3	mg/Kg	6.8	12.5	20.3	42.4
7440-48-4	Cobalt	3.5 - 8.9	mg/Kg	4.4	6.6	5.1	4.2
7440-50-8	Copper	9.3 - 18.7	mg/Kg	12.5	13	12.5	9.9
7439-89-6	Iron	11000 - 21400	mg/Kg	12000	18000	16900	14400
7439-92-1	Lead	8.9 - 31.6	mg/Kg	4.7	13.2	13	17.8
7439-95-4	Magnesium	1940 - 7360	mg/Kg	3390	2670	2590	1850
7439-96-5	Manganese	225 - 619	mg/Kg	288	415	429	539
7439-97-6	Mercury	0.027 - 0.057	mg/Kg	-	0.08	0.08	0.06
7440-02-0	Nickel	6.8 - 15.8	mg/Kg	10	14	11	9.5
7440-09-7	Potassium	400 - 1230	mg/Kg	497	447	432	286
7782-49-2	Selenium	0.21 - 0.25	mg/Kg	-	-	-	1.2
7440-22-4	Silver	0.25	mg/Kg	-	-	-	-
7440-23-5	Sodium	59.9 - 82.4	mg/Kg	-	-	-	-
7440-62-2	Vanadium	12.3 - 22.7	mg/Kg	11.3	21.6	19.7	18.7
7440-66-6	Zinc	31.1 - 64.1	mg/Kg	31.6	44.2	40.3	40.2
57-12-5	Total Cyanide	***	mg/Kg	NA	NA	NA	NA
	TCLP BNAs	Regulatory Criteria					
	None Detected		mg/L	NA	NA	NA	NA
	TCLP METALS						
7440-38-2	Arsenic	5	mg/L	NA	NA	NA	NA
7440-39-3	Barium	100	mg/L	NA	NA	NA	NA
7440-43-9	Cadmium	1	mg/L	NA	NA	NA	NA
7440-47-3	Chromium	5	mg/L	NA	NA	NA	NA

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Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Ferrochrome Open Storage Area					
			SAMPLE ID	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22
			LAB ID:	100511	100512	100513	100514	100515	100516
			DEPTH:	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5	1.0-1.5
			SOURCE:						
			SDG:						
		Recommended	MATRIX:	Soil	Soil	Soil	Soil	Soil	Soil
		Soil Cleanup	SAMPLED:	12/3/1998	12/3/1998	12/3/1998	12/3/1998	12/3/1998	12/3/1998
		Criteria	VALIDATED						
CAS NO	COMPOUND		UNITS:						
	VOLATILES								
74-83-9	Bromomethane	N/A	mg/Kg	NA	NA	NA	NA	NA	NA
75-09-2	Methylene chloride	0.1	mg/Kg	NA	NA	NA	NA	NA	NA
71-43-2	Benzene	0.06	mg/Kg	NA	NA	NA	NA	NA	NA
156-59-2	cis-1,2-Dichloroethene	NS	mg/Kg	NA	NA	NA	NA	NA	NA
156-60-5	trans-1,2-Dichloroethene	0.3	mg/Kg	NA	NA	NA	NA	NA	NA
127-18-4	Tetrachloroethene	1.4	mg/Kg	NA	NA	NA	NA	NA	NA
108-88-3	Toluene	1.5	mg/Kg	NA	NA	NA	NA	NA	NA
79-01-6	Trichloroethene	0.7	mg/Kg	NA	NA	NA	NA	NA	NA
100-41-4	Ethylbenzene	5.5	mg/Kg	NA	NA	NA	NA	NA	NA
1330-20-7	Xylene	1.2	mg/Kg	NA	NA	NA	NA	NA	NA
	Total VOCs		mg/Kg	NA	NA	NA	NA	NA	NA
	SEMIVOLATILES								
105-67-9	2,4-Dimethylphenol	NS	mg/Kg	NA	NA	NA	NA	NA	NA
91-57-6	2-Methylnaphthalene	36.4	mg/Kg	NA	NA	NA	NA	NA	NA
83-32-9	Acenaphthene	50	mg/Kg	NA	NA	NA	NA	NA	NA
208-96-8	Acenaphthylene	41	mg/Kg	NA	NA	NA	NA	NA	NA
120-12-7	Anthracene	50	mg/Kg	NA	NA	NA	NA	NA	NA
56-55-3	Benzo(a)anthracene	0.224 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA
50-32-8	Benzo(a)pyrene	0.061 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA
205-99-2	Benzo(b)fluoranthene	1.1	mg/Kg	NA	NA	NA	NA	NA	NA
191-24-2	Benzo(ghi)perylene	50	mg/Kg	NA	NA	NA	NA	NA	NA
207-08-9	Benzo(k)fluoranthene	1.1	mg/Kg	NA	NA	NA	NA	NA	NA
117-81-7	bis (2-Ethylhexyl) phthalate	50	mg/Kg	NA	NA	NA	NA	NA	NA
86-74-8	Carbazole	NS	mg/Kg	NA	NA	NA	NA	NA	NA
218-01-9	Chrysene	0.4	mg/Kg	NA	NA	NA	NA	NA	NA
53-70-3	Dibenzo(a,h)anthracene	0.014 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA
132-64-9	Dibenzofuran	6.2	mg/Kg	NA	NA	NA	NA	NA	NA
206-44-0	Fluoranthene	50	mg/Kg	NA	NA	NA	NA	NA	NA
86-73-7	Fluorene	50	mg/Kg	NA	NA	NA	NA	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	3.2	mg/Kg	NA	NA	NA	NA	NA	NA
91-20-3	Naphthalene	13	mg/Kg	NA	NA	NA	NA	NA	NA
87-86-5	Pentachlorophenol	1 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA
85-01-8	Phenanthrene	50	mg/Kg	NA	NA	NA	NA	NA	NA
108-95-2	Phenol	0.03 or MDL	mg/Kg	NA	NA	NA	NA	NA	NA
129-00-0	Pyrene	50	mg/Kg	NA	NA	NA	NA	NA	NA
	Total SVOCs		mg/Kg	NA	NA	NA	NA	NA	NA
	Pesticides/PCBs								
7421-93-4	Endrin aldehyde	NS	mg/Kg	NA	NA	NA	NA	NA	NA
	Herbicides								
94-75-7	2,4-D	0.5	mg/Kg	NA	NA	NA	NA	NA	NA

The criteria referenced are recommended soil cleanup objectives (TAGM 4046) for organic compounds, and are the hazardous characteristic levels for TCLP (40 CFR Part 261.1)

Sample concentrations that exceed the criteria and background range are shaded

- Not Detected

NS - No Standard.

R - Rejected Value

J - Estimated Value

N - Compound is tentatively identified

NA - Not analyzed

MDL - Method Detection Limit

TCLP BNAs - Toxicity characteristic Leaching procedure
Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Ferrochrome Open Storage Area					
		Range of Background Soil Concentrations	SAMPLE ID:	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22
			LAB ID:	100511	100512	100513	100514	100515	100516
			DEPTH	1 0-1 5	1 0-1 5	1 0-1 5	1 0-1 5	1 0-1 5	1 0-1 5
			SOURCE						
			SDG						
			MATRIX:						
			SAMPLED:	12/3/1998	12/3/1998	12/3/1998	12/3/1998	12/3/1998	12/3/1998
			VALIDATED:						
CAS NO.	COMPOUND		UNITS:						
	METALS								
7429-90-5	Aluminum	4650 - 9600	mg/Kg	7220	7850	8060	9100	8690	9470
7440-36-0	Antimony	0.29 - 0.49	mg/Kg	3.6	4.2	4.8	5.5	5.4	4.8
7440-38-2	Arsenic	2.7 - 6.5	mg/Kg	34.9	21.5	43.6	125	22.7	46.2
7440-39-3	Barium	21.7 - 75.4	mg/Kg	0.41	0.51	0.44	0.62	0.57	0.47
7440-41-7	Beryllium	0.26 - 0.58	mg/Kg	-	-	-	-	-	-
7440-43-9	Cadmium	0 14 - 0.29	mg/Kg	-	-	-	-	-	-
7440-70-2	Calcium	864 - 21500	mg/Kg	15800	951	3830	832	1100	2500
7440-47-3	Chromium	5 5 - 12.3	mg/Kg	17.7	14	17.8	13.3	11.1	10.8
7440-48-4	Cobalt	3.5 - 8.9	mg/Kg	5.5	5.3	4.4	6.4	6.1	4 6
7440-50-8	Copper	9 3 - 18.7	mg/Kg	14.6	12.2	10.3	15.4	18.8	10 2
7439-89-6	Iron	11000 - 21400	mg/Kg	16000	16400	15100	21600	20700	17600
7439-92-1	Lead	8 9 - 31.6	mg/Kg	10.3	6 9	8.7	7.2	6 4	9 3
7439-95-4	Magnesium	1940 - 7360	mg/Kg	4790	1980	1950	2310	2460	1880
7439-96-5	Manganese	225 - 619	mg/Kg	444	258	650	283	387	635
7439-97-6	Mercury	0 027 - 0.057	mg/Kg	-	0.03	0.06	0.03	0.02	0.03
7440-02-0	Nickel	6 8 - 15.8	mg/Kg	12	11.2	9.9	13 8	13 2	9 9
7440-09-7	Potassium	400 - 1230	mg/Kg	505	453	381	446	487	240
7782-49-2	Selenium	0 21 - 0 25	mg/Kg	-	-	-	-	-	1.1
7440-22-4	Silver	0 25	mg/Kg	-	-	-	-	-	-
7440-23-5	Sodium	59 9 - 82.4	mg/Kg	-	-	-	-	-	-
7440-62-2	Vanadium	12.3 - 22.7	mg/Kg	17.2	18 5	17.4	23.7	19 7	20.3
7440-66-6	Zinc	31.1 - 64.1	mg/Kg	40.5	31.8	38.2	38.7	47 1	44.1
57-12-5	Total Cyanide	***	mg/Kg	NA	NA	NA	NA	NA	NA
	TCLP BNAs	Regulatory Criteria							
	None Detected		mg/L	NA	NA	NA	NA	NA	NA
	TCLP METALS								
7440-38-2	Arsenic	5	mg/L	NA	NA	NA	NA	NA	NA
7440-39-3	Barium	100	mg/L	NA	NA	NA	NA	NA	NA
7440-43-9	Cadmium	1	mg/L	NA	NA	NA	NA	NA	NA
7440-47-3	Chromium	5	mg/L	NA	NA	NA	NA	NA	NA

The criteria referenced are recommended soil cleanup objectives (TAGM 4046) for organ compounds, and are the hazardous characteristic levels for TCLP (40 CFR Part 261 1)
Sample concentrations that exceed the criteria and background range are shaded
- Not Detected
NS - No Standard,
R - Rejected Value
J - Estimated Value
N - Compound is tentatively identified
NA - Not analyzed
MDL - Method Detection Limit
TCLP BNAs - Toxicity characteristic Leaching procedure
Base neutral acid extractables

Combined Soil Analytical Data Set
Scotia Depot
Focused SI and Phase II Site Assessment

				Lead/Zinc Open Storage Area		
		Range of Background Soil Concentrations	SAMPLE ID:	SED-1	SED-2	SED-3
			LAB ID:	C9L160246-006	C9L160246-08	C9L160246-010
			SOURCE:	Quanterra	Quanterra	Quanterra
			SDG:	D6F70	D6F75	D6F78
			MATRIX:	Soil	Soil	Soil
			SAMPLED:	12/15/1999	12/15/1999	12/15/1999
			VALIDATED:	1/30/2000	1/30/2000	1/30/2000
CAS NO.	COMPOUND	(ppm)	UNITS:			
	METALS					
7429-90-5	Aluminum	4650 - 9600	mg/Kg	2890	2740	1160
7440-36-0	Antimony	0.29 - 0.49	mg/Kg	2.6 J	0.46 J	2.2 J
7440-38-2	Arsenic	2.7 - 6.5	mg/Kg	6.5	4.8	19.3
7440-39-3	Barium	21.7 - 75.4	mg/Kg	25.3 J	21.1 J	12.6 J
7440-41-7	Beryllium	0.26 - 0.58	mg/Kg	0.25 J	0.35 J	0.22 J
7440-43-9	Cadmium	0.14 - 0.29	mg/Kg	1.3	1.3	1.3
7440-70-2	Calcium	864 - 21500	mg/Kg	55300 J	184000 J	220000 J
7440-47-3	Chromium	5.5 - 12.3	mg/Kg	10.4 J	3.9 J	5.2 J
7440-48-4	Cobalt	3.5 - 8.9	mg/Kg	3.1 J	2.9 J	1.8 J
7440-50-8	Copper	9.3 - 18.7	mg/Kg	1100	198	44.4
7439-89-6	Iron	11000 - 21400	mg/Kg	9830	7230	7510
7439-92-1	Lead	8.9 - 31.6	mg/Kg	1820 J	42.8 J	40.3 J
7439-95-4	Magnesium	1940 - 7360	mg/Kg	18200	31300	96900
7439-96-5	Manganese	225 - 619	mg/Kg	169 J	281 J	251 J
7439-97-6	Mercury	0.027 - 0.057	mg/Kg	2.5	-	0.022 J
7440-02-0	Nickel	6.8 - 15.8	mg/Kg	18.8	11.9	7.8
7440-09-7	Potassium	400 - 1230	mg/Kg	539 J	456 J	306 J
7440-23-5	Sodium	59.9 - 82.4	mg/Kg	107 J	348 J	162 J
7440-66-6	Zinc	31.1 - 64.1	mg/Kg	577 J	636 J	468 J

- Concentrations which exceed the maximum soil background concentration

- = Not Detected

J = Estimated Value

ATTACHMENT A

TCLP SOIL DATA

ATTACHMENT B

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

For

SOIL REMOVAL AT SCOTIA DEPOT
SCOTIA, NEW YORK

Prepared By:

PARSONS

290 ELWOOD DAVIS ROAD

LIVERPOOL, NY 13088

August 2002

1.0 SITE DESCRIPTION

The Scotia Depot is currently owned by the Federal Government and operated by the Defense Logistics Agency (DLA), Defense National Stockpile Center (DNSC). The facility is operated under the National Stockpile Program, for the purpose of storing metallurgical ores and materials necessary for manufacturing defense materials or strategic materials used in national defense.

The Scotia Depot is located on Route 5, just west of the Village of Scotia, New York. The site can be reached via Exit 25 off the New York State Thruway by taking Interstate 890 to Exit 5 (Broadway) and following the signs to Route 5 West. The site entrance is approximately 6,000 feet west of the intersection of Routes 5 and 147 in the Village of Scotia.

The current Depot property is approximately 59 acres in size. The Depot consists of five warehouses, two outdoor open storage areas, five support buildings used primarily for vehicle and/or equipment maintenance, and an administrative building.

The current Depot property is situated in the center of an industrial/commercial business park, which was formerly part of the original 337-acre Depot. The adjacent land use to the east and west of the Depot is commercial/industrial. Further out to the east and west, the land use is mixed residential/commercial. Land use to the south of the depot is a mixture of residential, commercial, recreational, and agricultural. The Erie Canal- Mohawk River is about 2,000 feet south of the Depot. To the north of the Depot is a large sand and gravel quarry; north of the quarry, the land use is primarily residential.

2.0 SCOPE OF WORK

This health and safety plan (HASP) covers a limited soil remediation action at three areas of concern (AOCs) at Scotia Depot. It is intended to supplement the General Safety and Health Plan (GSHP; Parsons, 1999) prepared previously, and which is attached to this document. Depot workers will remove approximately 900 yd^3 (1,350 tons) of soil and sediment from the AOCs. The Depot project manager anticipates that workers will conduct the following activities:

AOC 1 Former ferrochrome storage pad

- Leave the existing concrete pad in place.
- Clean the cracks and crevices of the pad with a vacuum device.
- Remove the top 2 feet of soil surrounding the pad, starting from the edge of the pad out approximately 5 feet.
- Backfill the trench with clean soil.

AOC 2 Former lead/zinc storage area

- Leave the existing asphalt pad in place.
- Remove the top 2 feet of soil surrounding the pad, starting from the edge of the pad out approximately 5 feet.
- Backfill the trench with clean soil.

AOC 3 Storm sewer catch basins

- Remove the sediment from catch basin previously sampled (SED-1, 2, 3).

The Depot anticipates that all sediment and soil removed can be disposed as solid waste. The project manager may make minor adjustments to the activities, as needed to properly accomplish the task, without revising this HASP.

3.0 CHEMICAL HAZARDS

Arsenic is the main chemical of concern (COC) at the AOCs, and the biggest concern would be for inhalation of large amounts of arsenic-containing dust. To a lesser extent, incidental ingestion and dermal contact are potential concerns. Thus, protection against arsenic-containing soil, dust, and sediment determines the safety precautions necessary. Although other heavy metals are also present in soil and sediments, the levels are below levels of concern. Additional information on arsenic is provided in the GSHP. Site data for arsenic are as follows (mg/kg):

Risk-based conc.	Max. background	Max. in lead zinc open storage area	Max. in ferrochrome open storage area
3.8	6.5	36.1	46.2

Arsenic was detected in multiple soil samples at maximum concentrations well over both the maximum local background value, and the risk-based concentration for industrial soils (USEPA Region III value). Although the arsenic was only detected at concentrations of less than 0.005 percent, there is a concern because arsenic is very toxic.

4.0 PHYSICAL HAZARDS

Workers will follow the usual Depot safety procedures associated with the use of heavy equipment, excavation, grading, soil movement, and backfilling.

5.0 PERSONNEL PROTECTION, MONITORING, AND OTHER PRECAUTIONS

Depot workers will conduct all work for this project, and are responsible for their own health and safety. Depot workers may use this plan to help guide their safe work practices.

The minimum level of protection required for all work at the AOCs is Level D, as described in the GSHP. If visible dust is present, workers will spray water, as needed, on areas being excavated in order to suppress airborne dust. Should these measures be insufficient to eliminate visible dust, workers will don half-face or full-face air-purifying respirators with high-efficiency particulate air (HEPA) filters. The use of dust monitoring instruments is not required for this work.

Workers should observe standard safe work practices during soil removal. No eating, drinking, or smoking is allowed in potentially-contaminated areas. Workers should wash hands before engaging in any of these activities. Workers should shower following the their shifts.

Incidental spillage of small amounts of soil (less than 50 pounds) is not a concern. Larger spills should be cleaned up. Workers should secure a durable tarp over each truck load of soil to

minimize loss during transport. No special decontamination procedures are needed. Equipment may be hosed off with water, as needed.

6.0 EMERGENCY RESPONSE PLAN

In the event of an emergency situation, on-site personnel will take appropriate actions to mitigate the situation and prevent physical injury. Workers will follow Depot procedures for emergency response, and may refer to the information below, as needed.

Emergency Response	911
Site Contact (Dennis Wesolowski)	(518)-370-3347
UFPO (NYS One call system)	(800) 962-7962
Ellis Hospital 1101 Nott St Schenectady, NY 12308-2488	(518)-386-4600

Route to the Ellis Hospital: Head East on Mohawk Ave for 1.1 miles. Continue onto Western Gateway Bridge for 0.7 miles Follow for 0.4 miles as the road goes into State Street. Turn left onto Erie Blvd. and stay on it for 0.7 miles. Bear right onto Nott St and continue for 0.7 miles. Turn left onto Randolph Rd for 0.2 miles and then turn sharply right onto Teviot Rd. Bear right 0.1 miles down the road onto Wendell Ave. Go 0.1 miles and follow the signs for the hospital.

REFERENCE

Parsons, 1999. *Focused Site Investigation, General Safety and Health Plan,* (attached).

FINAL
FOCUSED SITE INVESTIGATION
GENERAL SAFETY AND HEALTH PLAN

Prepared for

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE CENTER

Contract No. DACA87-95-D-0018
Delivery Order 0041

Prepared by

PARSONS ENGINEERING SCIENCE, INC.

May 1999

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SECTION 1
INTRODUCTION

1.1 PURPOSE

1.1.1 The purpose of this Global Safety and Health Plan is to promote personnel protection standards and safety practices and procedures for the Focused Site Investigation at 13 Defense National Stockpile Center (DNSC) depots. The plan assigns responsibilities, establishes standard operating procedures, and sets forth plans for contingencies that may arise while operations are being conducted at field work sites. This plan is also being used as a resource for DNSC depot employees who will be conducting a soil removal project at Scotia Depot. As such, certain elements of this plan may be used by the Scotia Depot employees to conduct their work. However, this plan was not written to be specifically for the soil removal project. Rather, the plan was written to support the Focused Site Investigation activities at 13 depots.

1.1.2 This Global Safety & Health Plan (GSHP) provides general guidance for making decisions during field activities. Sections address responsibilities and work procedures, physical and chemical risks, emergency procedures, and levels of required personal protection. Site-specific information such as a project description and site history, a contingency plan, a list of emergency contacts, and necessary health and safety equipment are presented as depot specific health addendum. Attached to this plan are a number of appendices which address specific activities or safety and health procedures that are required for conduct of this project.

1.2 APPLICABILITY

1.2.1 The plan provisions are mandatory for on-site activities undertaken at all 13 DNSC sites by Parsons Engineering Science, Inc. (Parsons ES) personnel. All site activities comply with the provisions of the Corporate Health and Safety (H&S) Policies and Procedures Manual and applicable standards in 29 CFR Parts 1910 and 1926. As site activities change, this plan may need to be modified. Such modifications are submitted as SSHP addenda and are numbered sequentially. All SSHP addenda are reviewed and approved by the Project Safety and Health Officer (PSHO).

1.2.2 All Parsons ES and subcontractor personnel must read this plan and sign the Plan Acceptance Form prior to the start of the work at this site. The Plan Acceptance Form is included in Appendix B containing Safety and Health forms.

SECTION 2
SITE DESCRIPTION

2.1 PROJECT LOCATION

The DNSC operates depots across the country for the purpose of stockpiling metallurgical ores and materials necessary for manufacturing products used in national defense. The primary materials stockpiled were: raw ore resources, processed ore stored in ingot form, and containerized material stored in warehouses. Most of the raw ore and processed ore were stored outdoors in piles that were not covered. These depots have operated since the 1940s but the need for natural resources has diminished. The DNSC is in process of selling and consolidating the materials, and for this purpose need to find out if the sites have been contaminated. Environmental sampling will be performed at thirteen DNSC depots:

1) Baton Rouge Depot, Louisiana

2) Fort Worth Depot, Texas

3) Curtis Bay Depot, Maryland

4) Point Pleasant Depot, West Virginia

5) Marietta Depot, Pennsylvania

6) Binghamton Depot, New York

7) Scotia Depot, New York

8) Voorheesville Depot, New York

9) Somersville Depot, New Jersey

10) Warren Depot, Ohio

11) Sharonville Depot, Ohio

12) Hammand Depot, Indiana, and

13) New Haven Depot, Indiana.

A description of each site will be included in the site specific work plan.

2.2 NATURE OF CONTAMINANTS AT DNSC DEPOTS

Following are the contaminants of concern at all/some DNSC depots:

- The primary contaminants of concern at all depots are metals leaching out from metallurgical ores: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Zinc, Mercury, Selenium, Silver, Thallium.

- A few sites may have radiological contaminants of concern (alpha, and beta radiation are suspected), due to storing material under Nuclear Regulatory Commission (NRC).

- A few sites have burn pits which were used for onsite destruction of wooden palates and possibly other wastes. In addition, some sites had fire fighting training areas, where different types of waste were used for fire fuel: printer ink, paint thinners, waste oil, petroleum products, and propylene glycol.

- Most of the sites had PCB transformers, which were removed or retrofilled at some point.

- Pesticides and herbicides were used at these sites for maintenance purpose in compliance with agricultural regulations.

- Buried unidentified explosive ordnance (UXOs) have been discovered at Curtis Bay site during routine site improvements. An archive search report was prepared for this depot (USAESCH, 1993). A UXO avoidance plan is presented in the Curtis Bay focused site investigation addendum.

SECTION 3
PURPOSE AND SCOPE OF DNSC PROJECT

3.1 SCOPE OF WORK

The result of Preliminary Assessments indicated that contamination is possible at these depots. The scope of the work is to conduct a Focused Site Investigation to confirm or deny the presence of contamination. Major contaminants of concern are metals, volatile and semi volatile organics (site specific), and pesticides (site specific). The toxic nature of these materials make worker awareness/ understanding of safety and health concerns critical to the safe conduct of this project. This plan is also intended to heighten the awareness/understanding of the Health & Safety aspects of the project.

This GSHP provides general guidance for making decisions during field activities. The following sections address responsibilities and work procedures, physical and chemical risks, emergency procedures, and levels of required personal protection. Site-specific information such as a project description and site history, a contingency plan, a list of emergency contacts, and necessary health and safety equipment will be provided in a depot specific Safety & Health addendum Attached to this plan are a number of appendices which address specific activities or safety and health procedures that are required for conduct of this project.

3.2 PURPOSE

During focused site investigation environmental samples, and data collection will be collected to determine whether the depots have been contaminated after approximately 40 years of operation. The major components of the work that will be conducted include the following:

- Visually inspect the sites, and collect any additional relevant data that may be locally available;
- Prepare planning documents for the field investigation that specifically address:
  - Management of the effort,
  - Chemical data, laboratory, and field sampling procedures,
  - Environmental protection,
  - Investigative derived waste (IDW) monitoring and disposal,
  - Site mobilization/demobilization and support,

- Quality control,
- Site Safety and Health (including site briefings, monitoring, decontamination, emergency response and site control),
- Protective Action

- Conduct field operations including collecting soil, surface water, groundwater, and sediment samples for laboratory analysis.
- Evaluate site investigation results and prepare the report; and
- Provide project management.

SECTION 4
STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

Parsons ES' policy is to provide its employees, subcontractors, and authorized visitors with information and procedures involved in site assessment. All personnel involved with this project will follow the Safety and Health procedures set forth in this plan.

4.1 SITE SAFETY AND HEALTH OFFICER

4.1.1 Parsons ES designates a site safety and health officer (SSHO) who defines, implements and enforces the site safety program and procedures. The SSHO conducts daily safety meetings and interfaces with other site representatives. The SSHO specifies level of personal protective equipment (PPE) and follows GSHP to specify PPE to be used. The SSHO takes the following action(s) when appropriate:

- Orders the immediate shut-down of site activities in the case of a medical emergency or unsafe practice.
- Ensures protective clothing and equipment are properly stored and maintained.
- Ensures that the environmental and personnel monitoring operations are on-going and in accordance with this SSHP.
- Restricts visitors from areas of potential exposure to harmful substances.

A daily log will be maintained on-site by the SSHO. This log will include:

- Date
- Daily safety meeting topic
- Briefing
- Area(s) checked
- Employees in each work area(s)
- Equipment being used by employees
- Protective clothing being worn by employees
- Protective devices being used by
  - Subcontractor's personnel
  - Visitors

  - Designated state and federal representatives
- First aid administered
- Visits by all outside personnel
- Any incidents of a Safety and Health nature
- Site Safety and Health Officer's signature

4.1.2 The Site Manager/SSHO has responsibility for implementing and enforcing the site safety program and procedures. They will oversee any personnel monitoring and will decide (in conjunction with the PSHO – if necessary) when action levels have been reached which require more stringent personnel protection. The SSHO enforces the personal protective equipment to be used for various site activities. The SSHO will maintain contact with the Parsons ES PSHO and keep her informed of all significant Safety and Health incidents/decisions.

4.1.3 The Site Manager/SSHO will be responsible for safety inspection of the work sites, material and equipment. Safety and health deficiencies and the corrective action(s) taken will be recorded. All pertinent information will be recorded in the daily log.

4.1.4 The Site Manager/SSHO will be responsible for compliance with Safety and Health issues at the project site. They have the authority to stop work if any operation or activity threatens worker safety or public health.

4.2 PROJECT MANAGER

The Project Manager is ultimately responsible for implementation and enforcement of the SSHP. They have the authority to access the required resources throughout Parsons ES and our subcontractors to ensure compliance with the contract requirements: including operational, QA/QC, Safety and Health, and regulatory matters.

4.3 PROJECT SAFETY AND HEALTH OFFICER

The Project Health and Safety Officer will be responsible for oversight and direction to ensure full compliance with all Safety and Health issues at the project site. They will oversee the Site Safety and Health Officer and interface as required with the QA/QC personnel.

4.4 EQUIPMENT OPERATORS

Equipment operators will be responsible for the maintenance, inspection, and safe operation of their equipment. Operators are responsible for daily inspection of their equipment and assuring it is in safe operating condition. Heavy equipment inspection logs will be completed and maintained on-site (refer to Appendix B).

4.5 EMPLOYEE SAFETY RESPONSIBILITY

Each employee is responsible for his own safety as well as the safety of those around him. The employee shall use all equipment provided in a safe and responsible manner as directed by Site Manager/SSHO. Personnel will follow the policies set forth in the Parsons Safety and Health procedures relevant to site operations which are included within or attached to this GSHP or appendices/addendums.

4.6 RESPONSIBLE PARSONS ES SAFETY AND HEALTH PERSONNEL

The depot personnel are responsible for Safety and Health on site.

Table 4.1 provides a more detailed listing of responsibilities of personnel working on this project.

Table 4.1
Responsibilities of Parsons ES Team Members
Defense National Stockpile Center Depots

Title	General Description	Responsibilities
Project Manager	Reports to upper-level management. Has authority to direct response operations. Assumes total control over site activities.	• Prepares and organizes the background review of the situation, the Quality Assurance Plan, the SSHP, and the field team. • Obtains permission for site access and coordinates activities with appropriate officials. • Briefs the field teams on their specific assignments. • Uses the Project Safety and Health Officer to ensure that safety and health requirements are met. • Serves as a liaison with public officials.
Project Safety and Health Officer (PSHO)	Advises Project Manager on all aspects of S&H	• Provides technical support concerning Safety and Health issues. • Manages/oversees the preparation of the SSHP. • Ensures that the Parsons ES Safety and Health protocols being followed conform with established industry protocols and standards. • Confirms each team member's suitability for work based on a physician's recommendation. • Conducts field Safety and Health audits to ensure SSHP conformance and Parsons ES policy compliance. • Certifies that all workers have proper training. • Reports all accidents to Parsons ES Corporate S&H Manager and investigates each accident or reportable incident.

Site Safety and Health Officer (SSHO)	Reports to the PSHO on all aspects of Safety and Health on site. Performs day-to-day H&S tasks. Stops work if any operation threatens worker or public health and/or safety.	• Specify level of PPE and follow GSHP for PPE to be used, and in case of any questions refer to PHSO. • Ensures that Parsons ES and all subcontractors perform personal inspections of protective equipment and clothing prior to, during, and after each use. • Ensures that Parsons ES's and all subcontractors' protective clothing and equipment are properly stored and maintained. • Controls entry and exit at the Access Control Points. • Ensures personnel are monitored for signs of stress, such as cold exposure, heat stress, and fatigue. • Implements the SSHP. • Prior to each work event, conducts inspections to determine if the SSHP is being followed. • Knows emergency procedures, evacuation routes, and telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department. • Coordinates decontamination procedures/provisions for medical care with USAESCH*. • Notifies USAESCH of emergency conditions. • Ensures that all required equipment is available. • Advises medical personnel of potential exposures and consequences. • Notifies emergency response personnel by telephone or radio in the event of an emergency. • Maintains log book for site workers and visitors. • Acts as spokesperson if OSHA inspector arrives on site. • Conducts initial on-site H&S briefing concerning pertinent H&S issues and new concerns. • conducts daily tailgate briefings. • Reports all accidents or H&S incidents to the PSHO and USAESCH.
Site Manager	Responsible for field team operations and safety.	• Manages field operations. • Oversees subcontractors' field operations. • Coordinates with the Site Safety and Health Officer in determining protection level. • Enforces site control. • Documents field activities. • Serves as liaison with public officials during field operations

Field Team	The work party must consist of at least two people.	• Safely completes the on-site tasks. • Complies with Site Safety and Health Plan. • Notifies SSHO/Site Manager or Supervisor of suspected unsafe conditions. • Inspects personal protective equipment prior to, during, and after each use.

* United States Army Engineering Support Center at Huntsville.

On this project the Site Manager role and the SSHO role will be performed by the senior member of a two person field team.

SECTION 5
JOB HAZARD ANALYSIS

Both physical and chemical hazards will present a risk to workers at DNSC Depots. The level of risk is dependent upon the type of work being done. Table 5.1 presents each activity, the associated hazards, the control measures planned to prevent accident, injury or illness. The subsections that follow describe (in greater detail) the physical and chemical hazards associated with the planned activities at the Defense National Stockpile Center Depots.

5.1 CHEMICAL HAZARD ASSESSMENT

5.1.1 Contaminants of Concern

Following are the contaminants of concern at DNSC sites:

- At all depots, the primary contaminants of concern are metals leaching from metallurgical ores: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Zinc, Mercury, Selenium, Silver, Thallium.

- A few sites may have some radiological contaminants of concern (alpha, and beta radiation are suspected) due to storing material under Nuclear Regulatory Commission

- Some of the sites have burn pits which were used for onsite destruction of wooden palates and possible waste disposal. In addition, some sites had fire fighting training areas, where different types of waste were used for fire fuel: printer ink, paint thinners, waste oil, petroleum products, and propylene glycol.

- Most of the sites had PCB transformers, which were removed or retrofilled at some point.

- Pesticides and herbicides were used for maintenance purpose in compliance with agricultural regulations.

- Buried unidentified explosive ordnance (UXOs) have been discovered at Curtis Bay site during routine site improvements. An archive search report was prepared for this depot (USAESCH, 1993). A UXO avoidance plan is presented in the Curtis Bay focused site investigation addendum.

5.1.2 Chemical Properties

Table 5.1 lists the potential routes of exposure and the symptoms for each contaminant. Other information such as Threshold Limit Values (TLVs), Permissible Exposure Limits (PELs), Immediately Dangerous to Life or Health (IDLH) values, physical properties, health effects, and immediately required first aid treatment.

5.1.3 Material Safety Data Sheets (MSDSs)

Material Safety data sheets for the primary contaminants of concern are provided in Appendix C. The Hazard Communication Program (29 CFR 1910.1200) has as its stated purpose: *"to ensure that the hazards of all chemicals produced or imported by chemical manufacturers or importers are evaluated and that information concerning their hazards are transmitted to affected employers and employees."*

5.2 IDENTIFICATION AND ANALYSIS OF PHYSICAL HAZARDS

5.2.1 Underground Utilities Hazards

Before any intrusive hand auguring or excavation activities, efforts must be made to determine if underground utilities, including sewers, telephone, water, fuel, or electrical lines, will be encountered, and, if so, where such underground utilities are located. Utilities company personnel or a utilities locator service shall be contacted and information concerning buried utilities will be obtained before starting any subsurface activities. A digging or intrusive clearance will be obtained by the Parsons Site Manager prior to commencing any intrusive activities.

5.2.2 Thunderstorms

Operation of heavy equipment and other fieldwork will cease during severe thunderstorms or severe rainstorms. The SSHO will determine when these conditions exist.

5.2.3 Slip, Trip, and Fall Hazards

5.2.3.1 Work sites may contain slip, trip, and fall hazards for site workers, such as:

- Holes, pits, or ditches;
- Slippery surfaces;
- Steep grades;
- Uneven grades;
- Sharp objects, such as nails, metal shards, and broken glass;
- Weather conditions, such as snow that will make surfaces slippery and obscure visibility.

5.2.3.2 Site personnel will be instructed to look for these potential safety hazards and immediately inform the SSHO or the Site Manager about any new hazards. If the hazard cannot be immediately removed, action must be taken to warn site workers about the hazard.

Table 5.2
Hazard Analysis By Site Activity
Defense National Stockpile Center Depot

Activity	Hazards	Control Measures
Manual sample collection using hand auger, and sledge hammer etc.,.	Environmental Hazards: • Storms - Tornadoes and Thunderstorms • Heat and Cold Injuries • Snakes/Spiders/Poisonous Plant	Education as to hazard(s), Avoidance of hazard or injury
	Slips, Trips and Falls, Ordnance Items(Curtis Bay)	Education and Exercise of Caution Recognition - Escort and Surface Clearance by EOD Specialist; No intrusive activities (e.g., putting stake into ground) without EOD clearance.
	Ionizing radiation exposure (Binghamton/Curtis Bay)	Radiological screening with Geiger Mueller Counter/Eberline HP-260 prior to sampling.
Mobilize and Construct Temporary Facilities	Slips, Trips and Falls	Educate and Exercise Caution
	Safety Issues Associated with Construction: • Vehicle and Heavy Equipment Operation • Materials Handling • Electrical Hazards • Noise • Pressurized Cylinders	Follow procedures outlined in the Appendices of SSHP. Provide Education/Training and SSHO monitors compliance.
	Environmental Hazards	Educate and Avoid
	Ordnance Items	No drilling/boring activities are permitted without utility clearance; and geophysical survey and EOD clearance.

5.2.4 Motor Vehicles and Heavy Equipment

5.2.4.1 Working with large motor vehicles and heavy equipment such as drill rigs can be a major hazard. Injuries can result from equipment hitting or running over personnel, or overturning of vehicles. Vehicles and heavy equipment design and operation will be according to 29 CFR Subpart 0, 1926.600 through 1926.602. The following precautions will be taken to help prevent injuries and accidents.

- Brakes, cables, hooks, light signals, fluid levels, steering, tires, and other safety devices will be checked and maintained in good working order throughout the duration of field activities.
- Large construction motor vehicles will not be backed up unless the vehicle has a reverse signal alarm audible above the surrounding noise level, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.
- Drill rig will be provided with necessary safety equipment including seat belts, roll-over protection, emergency shut-off during roll-over, backup warning lights, and audible alarms.
- Field support vehicles will be equipped with a first-aid kit and an appropriate fire extinguisher.

5.2.4.2 A daily inspection form for Heavy Equipment/Vehicles is included in Appendix B. This form should be completed by operators of Heavy Vehicles and Equipment during field operations at the DNSC depots.

5.2.5 Noise-Induced Hearing Loss

Planned activities will involve the use of heavy equipment, such as drilling rigs and generators. The unprotected exposure of site workers to this noise during activities can result in noise-induced hearing loss. The SSHO will ensure that either earmuffs or disposable foam earplugs are made available to, and used by, all personnel near operating heavy equipment, or other sources of high intensity noise.

Noise monitoring will be accomplished by field determination - if the whispered voice cannot be heard at a minimum three foot distance - hearing protection will be required.

5.2.6 Ionizing Radiation

Ionizing radiation exposure can possibly occur at Binghamton and Curtis Bay, due to the fact that these depots stored material under NRC. The components of ore which may contribute to radioisotopic activity include Uranium-238 and Thorium-232 which occur naturally, the daughter products of both these elements are α-particle and β-particle emitting isotopes. Hazard of being exposed to ionizing radiation arises as a result of digging or any other intrusive activity that raises dust particles that can be inhaled.

Personal monitoring from ionizing radiation will be accomplished using Geiger Mueller Counter/Eberline H-260 ZnS probe. When background ionizing radiation levels are exceeded, Air Purifying Respirator with N100 cartridge will be donned.

5.3 ENVIRONMENTAL HAZARDS

5.3.1 Snakes

A person bitten by a snake should try to lie still and be quiet. If the bite is in the arm or leg, keep the bite lower than the heart. Staying still and holding the bite lower than the heart will help to slow any poison spreading through the body. Ice the affected area if swelling or color change occur. Get medical care as soon as possible, even if the snake was known to be non-poisonous. The use of snake bite kits is prohibited. If possible, (without significant risk to additional personnel) the snake should be obtained for identification as to whether it is poisonous.

5.3.2 Ticks

If found crawling on a person, ticks should be removed and burned or smashed between two rocks. Do not smash ticks with fingers. If a tick is found to be holding onto the skin, the tick should be covered with Vaseline until it can no longer breathe and backs out of the skin. At that time, all parts of the tick should be removed with tweezers. Areas of the skin where the tick may have crawled, as well as bite area will be scrubbed with soap and water. Hot showers are to be taken as soon as possible after site departure to wash away all ticks that have not adhered to the skin.

5.3.3 Insect Bites/Stings

5.3.3.1 Mild insect bites should be treated by applying a baking soda paste or ice wrapped in a wet cloth. Bee stingers should be gently scraped off the skin, working from the side of the sting.

5.3.3.2 Persons who are believed to have been bitten by a brown recluse or black widow spider should be immediately transported to a hospital. The spider should be collected for confirmation of the species. Reactions to a brown recluse spider bite include mild to severe pain within two to eight hours and a star shaped area around the bite within three to four days. Reactions to a black widow spider include intense pain at the site of the bite after approximately 15 to 60 minutes, followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils, and generalized swelling of face and extremities.

5.3.3.3 If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought. Immediate care is needed if a person is allergic to insect bites/stings. Personnel with insect allergies should inform the Pro

5.3.3.4 If an allergic person receives a spider bite or insect bite/sting, medical attention should be sought immediately, the victim should be kept calm, and the

individual's vital signs should be monitored frequently. Rescue breathing should be given if necessary to supply oxygen to the victim.

5.3.4 Poisonous Plants

5.3.4.1 The majority of skin reactions following contact with offending plants are allergic in nature and are characterized by:

- General symptoms of headache and fever;
- Itching;
- Redness; and
- A rash.

5.3.4.2 Some of the most common and severe allergic reactions result from contact with plants of the poison ivy group, including poison oak and poison sumac. Such plants produce a severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim also may develop a high fever and may be very ill. Ordinarily, the rash begins within a few hours after exposure, but it may be delayed for 24 to 48 hours.

5.3.4.3 The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each. In certain seasons, both plants also have greenish-white flowers and berries that grow in clusters.

5.3.4.4 A person experiencing symptoms of poison ivy or poison oak should remove contaminated clothing; wash all exposed areas thoroughly with soap and water. Apply calamine or other poison ivy/oak lotion if the rash is mild. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity. Oak and ivy cleanser can be used after site work or after potential exposure to reduce chances of irritation.

5.3.5 Bloodborne Pathogens

5.3.5.1 Bloodborne pathogens enter the human body and blood circulation system through punctures, cuts or abrasions of the skin or mucous membranes. They are not transmitted through ingestion (swallowing), through the lungs (breathing), or by contact with whole, healthy skin. However, under the principle of universal precautions (see below) all blood should be considered infectious, and all skin and mucous membranes should be considered to have possible points of entry for pathogens.

5.3.5.2 There are a number of infections that are transmitted by insects and arthropods where the infection cycle includes the human blood system. Examples include malaria and Lyme disease, which are transmitted by mosquitoes and ticks, respectively. These diseases are serious, and the possibility for infection should be considered in planning field operations in areas where these disease vectors are present.

5.3.5.3 These diseases cannot be transmitted through personal contact with human blood, and are not covered by the OSHA *Bloodborne Pathogen Standard.*

5.3.5.4 Potential bloodborne pathogen exposure include:

- Contact with contaminated medical equipment or medical waste or sharps
- Medical emergency response operations such as administering first aid or CPR
- Contact with human wastes such as domestic sewage

5.3.5.5 Site personnel with first-aid and CPR responsibilities have received bloodborne pathogens briefing.

Table 5.1: Primary Contaminants at DNSC Depots PEL, TLVs, IDLH and Route of Exposure

Cont.	PEL mg/m^3	TLV mg/m^3	IDLH mg/m^3	Physical State Appearance	Exposure Route	Symptoms	First Aid
Arsenic	0.01	0.01	5	Silver gray or tin-white odorless solid	Inhalation, ingestion, dermal contact	Ulceration of nasal septum, skin and GI disturbance, peri neur, respiratory irritation, hypering of skin, carcinogen	Irr immediately; prompt soap wash; respiratory support; immediate medical attention
Chromium	1.0	0.5	250	Blue-white to steely gray lustrous metal, brittle, hard, odorless solid	Can be absorbed into the body by inhalation of its aerosol and by ingestion	Irritate eyes, skin, lung fiber (histologic)	Eyes, skin, Respiratory system
Lead	0.05	0.05	100	Heavy ductile soft gray solid	Ingestion, dermal contact, ingestion	Weak, lass, insomnia; facial pallor; pale eyes; anorexia, low weight; constipation, abdominal pain; anemia; gingival lead line; encephalopathy; kidney disease; irritate eyes; hypotension	Eyes, GI tract, CNS, kidneys, blood, gingival tissues
Mercury	0.1	0.025	10	Silver-white heavy, odorless liquid	Inhalation, absorption, ingestion, dermal contact	Irritate eyes, skin; cough, chest pain, bronchitis; tremor; insomnia, irritability, indecision, head fatigue, weakness; stomatitis; anorexia, low weight	Eyes. Skin, CNS, PNS, kidneys
Benzene	1 ppm ST 5ppm		500 ppm	Colorless to light yellow liquid, aromatic odor	Inhalation, absorption, ingestion, dermal contact	Irritate eyes, skin, respiratory system, skin; cough, wheezing, pneuitis; head, dizziness, CNS depression, nausea, vomit, kidney, liver, and spleen damage.	Irr immediately, immediate soap wash, respiratory support, immediate medical attention.
Gasoline products	-	300 ppm	-	Clear liquid with a characteristic odor	Inhalation, absorption, ingestion, congestion	Irritate eyes, skin, mucous membrane; head, fatigue, blurred vision, slurred speech, convulsion; chemical pneu (aspir); possible liver, kidney damage; carcinogen	Eyes, skin, respiratory system, CNS, liver, kidneys
Petroleum distillate	2000 ppm	300 ppm	-	Colorless liquid with a gasoline-like odor	Inhalation, ingestion, dermal contact	Irritate eyes, nose, throat; dizziness, drowsiness, head, nausea; dry cracked skin; chemical pneu (aspir liq)	Irr immed, soap wash prompt, respiratory support, immed medical attention
Propylene glycol	50ppm						

SECTION 6
ACCIDENT PREVENTION

6.1 INTRODUCTION

6.1.1 All field personnel will receive site-specific Safety and Health briefing before starting any site activities. On a day-to-day basis, individual personnel should watch for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Emergencies can be averted by rapid recognition of dangerous situations. Before assigning daily tasks, tailgate safety meetings will be held.

6.1.2 The Site Manager/SSHO supervises the field team to ensure they are meeting safety and health requirements. If deficiencies are noted, work is stopped and corrective action is taken (e.g., obtain, purchase additional safety equipment). Reports of Safety and health deficiencies and the corrective action taken are forwarded to the Project Manager and PSHO.

6.2 ACCIDENT PREVENTION PROGRAM

6.2.1 Parsons ES has a policy of compliance with all governing safety standards and regulations, and a safety performance goal of zero accidents, operational mishaps, and injuries/disease. Accident prevention is a key program element if we are to achieve compliance and strive towards our ultimate goal of zero incidents. The accident prevention program which will be implemented at DNSC depots will include:

- Daily Safety and health inspections by the Site Manager/SSHO.
- Initial site-specific and daily tailgate safety and health briefing will be provided by the SSHO and/or the Safety Officer from the UXO subcontractor (specific to Curtis Bay depot). The topics for tailgate briefings will include:
  1. Recent safety violations/problems or incidents;
  2. Seasonal topics (e.g., heat/cold injuries);
  3. Review of SSHP elements that inspections have indicated are needed; and
- Inspection dates/time, inspectors name and results of inspection will be recorded in the Site Manager/SSHO's logbook.
- Sign-in sheets with dates/topics of tailgate briefing will be completed for each session. The Site Manager/SSHO will record each session in the logbook and file the sign-in sheets in project files.

- Reporting of safety hazards by site personnel.
- Aggressive reporting and follow-up on all safety violations, accidents, injuries, and illnesses. Forms for this reporting include those found in Appendix B and the SSHO's daily logbook.
- Compliance with the SSHP for all personnel working at DNSC depots.

6.2.2 Personnel responsible for implementing this accident prevention program are those previously identified in Table 4.1.

6.3 SURVEILLANCE OF SUBCONTRACTOR SAFETY

6.3.1 Requirements

6.3.1.1 Achieving a high standard of safety where human life or property is involved requires full and complete compliance with and acceptance of requirements on the manner in which work is performed. All personnel, whether employers or employees, must share responsibility in performing all work in such a manner and under such conditions as to preclude or minimize the possibility of damage to property or injury to themselves or others.

6.3.1.2 Subcontractors are responsible for their own safety and health programs and for their agents and employees, regardless of whether the prime contractor employs a safety and health representative at the site. Safety equipment and safeguards suitable to the occupational hazards involved and conforming to the safety regulations at the work site must be furnished by each subcontractor (when not furnished by Parsons).

6.3.1.3 In the event of an apparent violation of a safety standard, Parsons' Site Manager/SSHO will call the violation to the subcontractor's attention and request that the situation be corrected. The seriousness of the violation dictates the abatement period allowed. In the event of imminent danger to life, limb, or property, the Parsons' Site Manager/SSHO will insist that the portion of the work affected be stopped until the situation is corrected to minimize the hazards relative to the specific area of work. The Site Manager/SSHO will inform the subcontractor at the time a violation is noted, using one of the following methods.

6.3.2 Non-Serious Violation

A non-serious violation is defined as a situation where an accident or an occupational illness resulting from a deviation from standard probably would not cause death or serious physical harm, but would have a direct or immediate relationship to the safety or health of employees. For incidents that are considered non-serious, the subcontractor will be verbally advised and the violation entered in the Site Manager/SSHO's daily log and the project file.

6.3.3 Serious Violation

A serious violation is defined as having a high probability of death or serious physical harm to employees resulting from a condition that exists on the job site. In matters that the SSHO or the Site Manager deems serious, the subcontractor will be informed both verbally and by means of a violation form (Figure 6.1) citing the regulatory standard violated.

6.3.4 Imminent Danger Violation

Imminent danger is defined as any condition or practice that could reasonably be expected to cause death or serious physical harm. In cases that the Site Manager/SSHO feels are immediately dangerous to life, limb, or property, the Site Manager/SSHO will insist that the subcontractor cease site activities until the hazardous conditions are minimized. In such cases, the Site Manager/SSHO will issue a written statement of the standard or standards violated (Figure 6.1 or a letter) and approve acceptable activities to minimize the hazards specific to the incident.

6.4 TRAINING

Training at the site will include a site-specific initial briefing session prior to commencing activities at the site to cover all aspects of this HSP, and daily "tailgate" briefings prior to beginning work each day.

6.5 DAILY SAFETY INSPECTIONS

The Site Manager/SSHO will conduct daily inspections of sites and site operations. The results of the inspections will be recorded in the logbook and be provided to the PSHO.

6.6 TRAFFIC CONTROL

An area near each depot will be designated for parking. Personnel will follow all local vehicular laws, especially posted speed-limits.

6.7 SITE HOUSEKEEPING

Personnel will maintain the site facilities in a clean, neat, and sanitary condition at all times. Each depot has facilities that will be used for personal hygiene.

Figure 6.1
Notification of Violation of Safety Policies

PARSONS

SUBJECT: SAFETY/HEALTH VIOLATION Job No. _____

Location: _____

In the interest of safety and health, the following violation/s were noted:

Contractor _____

Date _____ Date complied with _____

Representative _____

Repeat Violation Yes ☐ No ☐

Violation:

Recommendation:

Abatement Period _____

Standard Source _____

OSHA ☐ STATE ☐

LOCAL ☐ ANSI ☐

OTHER ☐ NFPA ☐

SUBCONTRACTOR

6.8 FIRE PREVENTION AND PROTECTION

Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation, and flying objects, but may also cause the release of toxic chemicals into the environment. Such releases can threaten both personnel on-site and members of the general public living or working nearby. Site personnel involved with potentially flammable material or operations will follow the guidelines listed below to prevent fires and explosions:

- Prior to initiation of site activities involving explosive/flammable materials, all potential ignition sources will be removed or extinguished;
- Dilution or induced ventilation may be used to decrease the airborne concentration of explosive/flammable atmospheres;
- Smoking is prohibited at work sites, or in the vicinity of, operations which may present a fire hazard, and the area will be conspicuously posted with signs stating "No Smoking or Open Flame Within 50 Feet";
- Flammable and/or combustible liquids must be handled only in approved, properly labeled metal safety cans equipped with flash arresters and self-closing lids;
- The motors of all equipment being fueled will be shut off during the fueling operations;

The following safe work practices will be used to protect against fires:

- At least one portable fire extinguisher having a rating of not less than 20:ABC will be located at each work site.

6.10 FALL PROTECTION

6.10.1 Activities to be performed at DNSC depots are not expected to require fall protection. However, a body harness with lanyard will be worn by any personnel working at risk of falling more than 6 feet. The lanyard will be adjusted to limit free-fall to no more than 6 feet. Lanyards must be secured to strong structural components or static lines.

6.10.2 If lanyards and safety harnesses are deemed impractical, safety nets must be provided.

6.11 SAFE CLEARANCE

Extra precautions will be taken when using drill rigs near overhead electrical lines. The minimum clearance between overhead electrical lines of 50 kilovolts (kV) or less and any extended portion (e.g., boom/bucket on backhoe) is 10 feet. For lines rated over 50 kV, the minimum clearance between the line and any part of the heavy equipment is 10 feet plus 0.4 inches for each kV over 50 kV.

6.12 SEVERE WEATHER

In the event of severe weather: high winds, electrical storms, tornadoes, extremely hot weather (>100°F), or extremely cold weather (<0°F), it may be necessary to cease operations and evacuate the site. The Site Manager/SSHO will be responsible for monitoring the weather Should severe weather threaten, the Site Manager/SSHO is responsible for deciding (in conjunction with the Depot Manager) if site operations should cease.

All operations will cease during thunderstorms.

6.13 ACCIDENT INVESTIGATION AND REPORTING

In the event an accident occurs at the site, the SSHO will investigate the accident after all emergency actions have been taken. The Parsons ES accident form (see Appendix B) will be filled out by the Site Manager/SSHO and submitted to the Parsons ES PSHO.

An accident will be reported immediately to the USACE if any of the following occur as a result of an accident,

- Fatal injury;
- Injury to three or more persons who are admitted to the hospital;
- Property damage in the amount of $1,000 or more; or
- May result in unfavorable criticism of the Army.

Other lost-time or OSHA reportable accidents will be reported to the USACE within seven working days.

6.14 HAZARD REDUCTION PROGRAM

As identified and described in paragraph 6.1, the Hazard Reduction Program for work at DNSC depots include:

- Education of site personnel as to the hazards and measures to minimize/prevent these hazards;
- Inspections to determine compliance with required SSHP and general safety provisions – with reporting and retraining as needed; and
- Reporting and follow-up on safety violations, accidents, injuries and illnesses.

SECTION 7
PERSONAL PROTECTIVE EQUIPMENT

7.1 INTRODUCTION

Parsons ES staff will work onsite during sampling work. If at any point in the investigation contaminants/concentration of higher level of concern is detected, the level of protection will be re-evaluated by the SSHO/PSHO and the other actions outlined in the Emergency Response Plan will be taken immediately.

7.2 LEVELS OF PROTECTION

Different activities at the site will require different levels of protection. The possible levels of protection to be used at the site are outlined below. Table 7.1 shows a list of activities to be performed at the site and the associated levels of PPE.

7.2.1 Level D

The minimum level of protection required of all personnel at the site is Level D. The following is Level D protection:

- Short or long sleeve cotton coveralls or work clothing;
- Sturdy work boots/shoes, steel toe when working around heavy equipment. Geophysical survey personnel will not use steel toe boots;
- Safety glasses with side shields or goggles when an eye hazard exists;
- Hard hat, when a head hazard exists;
- Leather or canvas work gloves when a scrape/cut hazard exists; and
- Hearing protection, when working around drilling rigs or powered hand tools.

7.2.2 Level C

For locations with confirmed presence of radioactive contaminants Tyvek suit and Air Purifying Respirator with contaminant specific cartridge will be used. For locations with confirmed mercury vapors Air Purifying Respirator with mercury cartridge will be used.

Table 7.1
Site Activities and Required Levels of Protection

Site	Activities	Level(s) of Protection	Notes
All DNSC depots	Routine environmental sampling	Level D	-
Depots with historical burn area	When benzene concentration is detected 1-50 ppm using Draegar tube with organic vapor cartridge	Level C	Respiratory protection using Air Purifying Respirator with organic cartridge.
Curtis Bay Site (Radiation)	When ionizing radiation is detected above the background level using Eberline H-260 ZnS probe	Level C	Mist water on sampling area to reduce the risk of particle inhalation. Respiratory protection using Air Purifying Respirator with N100 cartridge.
All DNSC Depots	If mercury vapors are detected using Draegar tubes	Level C	Respiratory protection using Air Purifying Respirator with mercury vapor cartridges.

Notes:

1 ***Level D*** - Coveralls, safety boots, hard-hats (if near heavy equipment).1

2 ***Level C*** - Air purifying respirator, Tyvek suit, boots, gloves.

SECTION 8
MEDICAL SURVEILLANCE AND MEDICAL SUPPORT

8.1 Personnel engaged in hazardous waste operations are required to be enrolled in a medical monitoring program as required by 29 CFR 1910.120(f). Parsons ES utilizes the services of licensed, local physicians for medical examinations and a contract occupational health physician to review all medical records to provide medical surveillance of employees at the various Parsons ES offices (Medical Services Network: 1-800-874-4676 Ext.111). Medical monitoring is also required for subcontractors. A letter (signed by a physician) attesting to each individual's fitness for duty must be provided to the Project Manager (by Parsons ES and Subcontractor personnel) prior to beginning work

8.2 The medical support plan for work at this site is contained in Appendix D to this GSHP, it describes Parsons ES' medical surveillance and medical records procedure

SECTION 9
ENVIRONMENTAL AND PERSONAL MONITORING

9.1 AIR MONITORING

Air monitoring will be conducted during subsurface soil sampling (i.e., greater than 6 inches deep), and drilling activities. Monitoring will be conducted by Parsons ES personnel. The purpose of this air monitoring is three-fold:

- To determine the airborne concentrations of contaminants to which personnel working on the site would be exposed without PPE or other control measures, and to evaluate the adequacy of PPE or other control measures used by site workers.
- To determine the airborne concentrations of contaminants being released from on-going site activities and to evaluate the need for additional engineering controls during drilling.
- To determine the airborne contaminant concentrations leaving the site during intrusive activities and to evaluate/document potential public exposures.

9.2 AIR MONITORING INSTRUMENTS

The air contaminants to be measured include volatile organic compounds (VOCs), and mercury vapors. The air monitoring instruments or methods used to evaluate airborne concentrations of these contaminants are indicated below:

9.2.1 VOCs

Photoionization detector (PID) with an 10.2 electron volt (eV) lamp will be used to conduct general VOC monitoring.

9.2.2 Mercury Vapor Analysis

Mercury vapor Draegar tubes (measure concentration range of 0.05 - 2 mg/m^3) will be used as qualitative indicator of mercury vapors, at specific depots where mercury storage occurred..

9.3 ACTION LEVELS

The following action levels will be used to control site activities, and potential worker and public exposures.

VOCs detected on the PID will be used as shown in Table 9.1.a to determine the appropriate levels of protection:

Table 9.1.a: VOC Concentration detected and Required Level of Protection

Concentration of total VOCs at Breathing Height (5-5.5 ft)	Required Level of Protection
0 - 50 ppm*	Level D
> 50 ppm	Stop work; reevaluate activities at site area.

* If PID records total VOC concentration ≥ 10 ppm, Benzene Draegar tube will then be used to monitor the concentration of benzene. The concentration of benzene detected on the Draegar tube will be used as shown in Table 9.1.b. to determine the appropriate level of protection:

Table 9.1.b: Benzene Concentration detected and Required Level of Protection

Concentration of Benzene at Breathing Height (5-5.5 ft)	Required Level of Protection
0 - 1 ppm	Level D
> 1 - 50 ppm	Level C
> 50 ppm	Stop work, reevaluate activities at site area

9.4 Ionizing Radiation

Geiger Mueller Counter/Eberline H-260 Zinc sulfide probe will be used where radiation (beta, and alpha are primary radiation of concern) is suspected. If the radiation is found above the background level, the sampling area will be misted with water to reduce the risk of particle inhalation, and a full face Air Purifying Respirator with 100 N cartridge will be donned.

SECTION 10
HEAT AND COLD STRESS

10.1 HEAT STRESS

10.1.1 Sweating does not cool the body unless the sweat is evaporated from the body. Working in the field under sun with the use of personal protective equipment (PPE) reduces the body's ability to eliminate large quantities of heat because the evaporation of sweat is decreased. The body's effort to maintain an acceptable temperature may become impaired and this may cause heat stress. Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks. If semi-permeable and impermeable PPE is used at these sites, heat stress is a **MAJOR HAZARD** to involved site workers.

10.1.2 Heat stress related problems include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke. Heat rash occurs because sweat is not evaporating, making the skin wet most of the time. Standing erect and immobile in the heat allows blood to pool in the lower extremities. As a result, blood does not return to the heart to be pumped back to the brain and fainting may occur. Heat cramps are painful spasms of the muscles due to excessive salt loss from profuse sweating. Heat exhaustion occurs due to the large fluid and salt loss from profuse sweating. A person's skin is clammy and moist; and nausea, dizziness, and headaches may occur.

10.1.3 Heat stroke occurs when the body's temperature regulatory system has failed. Skin is hot, dry, red, and spotted. The affected person may be mentally confused, delirious, and convulsions may occur. A person exhibiting signs of heat stroke should be removed from the work area to be shaded area immediately. The person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately. EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.

10.1.4 Monitoring of personnel wearing PPE should begin when the ambient temperature is 70°F or above. Table 10.1 presents the suggested frequency for such monitoring. Monitoring frequency should increase as the ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by a person with a current first-aid certification who is trained to recognize heat stress symptoms.

Table 10.1[1]
Suggested Frequency of Physiological Monitoring
For Fit and Acclimatized Workers[a]
DNSC DEPOTS

Adjusted Temperature[b]	Normal Work Ensemble[c]
90°F (32.2°C) or above	After each 45 minutes of work
87.5°-90°F(30.8°-32.2°C)	After each 60 minutes of work
82.5°-87.5°F (28.1°- 30.8°C)	After each 90 minutes of work
77.5°-82.5°F (25.3°- 28.1°C)	After each 120 minutes of work
72.5°-77.5°F (22.5°- 25.3°C)	After each 150 minutes of work

(1) NIOSH/OSHA/USCG/EPA, 1985.

(a) For work levels of 250 kilocalories/hour.

(b) Calculate the adjusted air temperature (ta adj) by using the equation:
ta adj = ta + (13 x percent sunshine)
where: ta is the air temperature in °F.

Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat.

Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow (100 percent sunshine = no cloud cover and a sharp, distinct shadow; zero percent sunshine = no shadows.)

(c) A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

10.2 EARLY SYMPTOMS OF HEAT STRESS RELATED PROBLEMS

10.2.1 Early symptoms of heat stress related problems include the following:

1. Decline in task performance
2. Lack of coordination
3. Decline in alertness
4. Unsteady walk
5. Excessive fatigue
6. Muscle cramps
7. Dizziness

10.2.2 To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.

  - If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

  - If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

- Oral temperature. Use a clinical thermometer or similar device to measure the oral temperature at the end of the work period (before drinking).

  - If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.

  - If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third.

  - Do not permit a worker to wear a semipermeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

10.3 PREVENTION OF HEAT STRESS

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illnesses. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.

  - Modify work/rest schedules according to monitoring requirements.

  - Mandate work slowdowns as needed.

- Perform work during cooler hours of the day, if possible, or at night if adequate lighting can be provided.

- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluids intake must approximately equal the amount of water lost in sweat, e.g. 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kg) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

  - Maintain water temperature at 50° to 60°F (10°-16.6°C).

  - Provide small disposable cups that hold about 4 ounces (0.1 liter).

  - Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.

  - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

- Train workers to recognize the symptoms of heat-related illnesses.
- Rotate personnel and alternate job functions.

10.4 COLD-RELATED ILLNESS

Exposure to low temperatures presents a risk to employee safety and health both through the direct effect of the low temperature on the body and collateral effects such as slipping on ice, decreased dexterity, and reduced dependability of equipment. Work conducted in the winter months can become a hazard for field personnel due to cold exposure. All personnel must exercise increased care when working in cold environments to prevent accidents that may result from the cold. The effects of cold exposure include frostbite and hypothermia. Wind increases the impact of cold on a person's body. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite. Recognition of the symptoms of cold-related illness will be discussed during the health and safety briefing conducted prior to the onset of site activities during cold weather.

- **Hypothermia.** Hypothermia is defined as a decrease in a person's core temperature below 96°F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interference with any of these mechanisms can result in hypothermia, even in the absence of "cold" ambient temperatures. The first symptom of systemic hypothermia is shivering. Maximum shivering starts when the core body temperature drops below 95°F. The next set of symptoms as the body's cooling progresses is apathy, listlessness, and sleepiness. The person remains

conscious and responsive with normal blood pressure and a core temperature of 93.2°F. The person must be removed immediately to a facility with heat. As hypothermia advances beyond this point, the person has a glassy stare, slow pulse, slow respiratory rate, and may lose consciousness. Severe hypothermia starts when the core body temperature reaches 91.4°F. Finally, the extremities start to freeze and death may result.

- **Work Practices**

Adequate insulating dry clothing should be worn if work is performed in air temperature < 40^0F. Wind chill cooling rate and cooling power of air are critical factors (wind chill cooling rate is defined as heat loss from a body expressed in Watts/m^2 which is a function of the air temperature and wind velocity upon the exposed body). The higher the wind speed and lower the temperature in the work area, greater the insulation value of clothing required. The use of extra insulating clothing and/or a reduction in the duration of exposure period are among special precautions. The work should be arranged in such a way that sitting still or standing still for long periods are minimized. If work is performed continuously in the cold at an Equivalent Chill temperature of 19.4^0F (see Table 10.2), the workers should take a 10-minute break every hour in Depot Manager's office/heated storage warehouse, the frequency will also depend upon the severity of cold. Dehydration, or the loss of body fluids occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to significant change in blood flow to the extremities. Warm sweet drinks or soups may be taken to regulate caloric intake and fluid volume. The intake of coffee should be limited because of diuretic and circulatory effect.

Table 10.2: Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)

	Actual Temperature Reading (^{0}F)					
Estimated Wind Speed (mph)	**50**	**40**	**30**	**20**	**10**	**0**
	Equivalent Chill Temperature (^{0}F)					
calm	50	40	30	20	10	0
5	48	37	27	16	6	-5
10	40	28	16	4	-9	-24
15	36	22	9	-5	-18	-32
20	32	18	4	-10	-25	-39
25	30	16	0	-15	-29	-44
30	28	13	-2	-18	-33	-48
35	27	11	-4	-20	-35	-51
40	26	10	-6	-21	-37	-53

The following is suggested as a guide for estimating wind velocity if accurate information is not available:

- 5 mph: light flag moves;
- 10mph: light flag fully extended;
- 15 mph: raises newspaper sheet;
- 20 mph: blowing and drifting snow.

SECTION 11
SITE CONTROL

11.1 INTRODUCTION

The purpose of site control is to minimize potential contamination of workers, protect the public, and prevent unauthorized entry. Site control involves the physical arrangement and controlling access into established work zones.

11.2 SITE WORK ZONES

To reduce the spread of hazardous materials by workers from the contaminated areas to the clean areas, zones will be delineated on each site to aid in controlling the flow of personnel and equipment between the zones. The establishment of the work zones will help ensure that personnel are properly protected against the hazards present where they are working; work activities and contamination are confined to the appropriate areas; and personnel can be located and evacuated in an emergency. Site work zones will be established for drilling activities. Exclusion zone, contamination-reduction zone, and the support zone are described in greater detail below.

11.2.1 Exclusion Zone (EZ)

The EZ is work area where intrusive investigation will take place. Within the EZ, PPE, and respiratory protection (where required) may be worn by all personnel. The hotline, or EZ boundary, will be established through visual observations and/or general air monitoring requirements. All Parsons personnel and subcontractors will be properly trained in controlling and minimizing access to the EZ. Should an unauthorized person enter the EZ they will be stopped and escorted to the support zone. If necessary, work will be stopped until the situation is resolved. Unauthorized entry will be recorded in the field notebook.

11.2.2 Contamination-Reduction Zone (CRZ)

The CRZ is the transition area between the contaminated area and the clean area. This zone provides an area to prevent or reduce the transfer of hazardous materials which may have been picked up by personnel or equipment leaving the EZ.

11.2.3 Support Zone

11.2.3.1 The support zone is considered a clean area. The support zone for each site will be located at sufficient distance from intrusive activity, it contains sampling vehicles and support supplies. Level D PPE is appropriate apparel within this zone. Contaminated clothing and equipment are not permitted in the support zone. If activities

are to be conducted during the winter months, special types of PPE and other safety equipment susceptible to freezing (e.g., eye wash and decontamination solutions) will be stored in a heated space.

11.3 EMERGENCY PROTOCOL

Should an emergency occur while personnel are in site work zones, cellular phones will be used to alert site personnel that an emergency exists. The call will indicate to site personnel that work activities are to cease and be secured, and personnel are to proceed back through the decontamination zone (if they are in the EZ or CRZ) and assemble at the Depot manager's office. Emergency Response and Contingency Plan Section 14, contains details on this and other emergency procedures which will be used at DNSC depots.

SECTION 12
PERSONNEL DECONTAMINATION

12.1 PERSONNEL DECONTAMINATION

This section discusses personnel decontamination. To prevent harmful materials from being transferred into clean areas or from exposing unprotected workers, all field personnel and equipment exiting an area of potential contamination should undergo decontamination. The extent of decontamination depends on a number of factors, the most important being the type and concentration of the contaminant involved.

12.1.1 Level D decontamination will consist of rinsing, removal and bagging of PVC or Neoprene gloves. An exclusion zone will be established for Level C activities (if needed) to prevent personnel from entering these areas without proper safety equipment (e.g., hard hat, steel-toe boots, respirators, etc.). Personnel should wash hands and face before eating and before leaving the site.

12.1.2 Level C Decontamination Procedures

If Level C protection is required, decontamination procedures will be divided into 5 stations. These stations represent procedures and are not necessarily separate locations. Level C decontamination will consist of the following:

Station 1: Segregated Equipment Drop

Deposit equipment used on the Site (tools, sampling devices and containers, monitoring instruments, clipboards, etc.,.) on plastic drop cloths and in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Necessary equipment includes:

1. Containers of various sizes;

2. Plastic liners; and

3. Plastic drop cloths.

Station 2: Wash Gloves and Boot Removal

Wash the gloves and remove boots and deposit in individually marked plastic bags.

Necessary equipment includes:

1. Plastic bag; and

2. Bench or stool.

Station 3: Cartridge Change

If a worker leaves the exclusion zone to change cartridges, this is the last step in the decontamination process. The worker's cartridges are exchanged, new outer gloves and boots donned, and joints taped. Worker returns to duty. Otherwise the worker proceeds to Station 5.

Necessary equipment includes:

1. Cartridges;

2. Tape;

3. Boot covers; and

4. Gloves.

Station 4: Removal of Chemically Resistant Suit

With assistance of helper, remove Tyvek suit. Deposit in a container with plastic liner.

Necessary equipment includes:

1. Container (20 gallon)

2. Chair; and

3. Plastic liner.

Station 5: Respirator and Glove Removal

Remove face piece. Avoid touching face. Wash respirator in clean sanitized solution, allow to dry and deposit facepiece in plastic bag. Store in clean area. Remove inner gloves and deposit in container with plastic liner.

Necessary equipment includes:

1. Plastic bags;

2. Sanitizing solution;

3. Towels; and

4. Container with plastic liner.

Modifications can be made to the 5 station decontamination procedures depending upon the extent of contamination. The effectiveness of the decontamination procedure should be checked by visual inspection

12.2 EQUIPMENT DECONTAMINATION

A decontamination area will be established in an area of the site considered free from contamination. Equipment decontamination activities will be centralized in this area. Decontamination water and solids will be collected at the decontamination area.

Clean, disposable gloves, and eye protection (safety glasses) will be worn while handling sampling equipment during the decontamination. Distilled/Deionized, organic-free water and isopropanol will be stored in glass containers and applied via labeled, Teflon wash bottles.

12.3 DECONTAMINATION PROCEDURES DURING MEDICAL EMERGENCIES

Decontamination procedures during medical emergencies must be thorough to prevent exposure of unprotected medical personnel and facilities. Cutting away disposable clothing and other similar decontamination activities should be undertaken to expedite decontamination to the maximum extent possible.

12.3.1 Chemical Exposure

12.3.1.1 Exposure to chemicals can be divided into two categories:

- Injuries from direct contact, such as acid burns or inhalation of toxic chemicals, and
- Potential injury caused by gross contamination of clothing or equipment.

12.3.1.2 For inhaled contaminants, treatment can only be performed by qualified physicians. If the contaminant is on the skin or in the eyes, first-aid treatment generally includes flooding the affected area with water. For a few chemicals, however, water may cause more severe problems.

12.3.1.3 When protective clothing is grossly contaminated, contaminants may be transferred from the wearer to treatment personnel and cause injuries. The protective clothing should be washed off as rapidly as possible and then carefully removed.

SECTION 13
EMERGENCY RESPONSE AND CONTINGENCY PLAN

Emergencies such as chemical exposure of a worker, or a personal injury may occur during work. In the event that an emergency develops, the procedures outlined in this section are to be followed.

13.1 EMERGENCY EQUIPMENT

In each operative decontamination area, the SSHO will establish an emergency equipment station containing the following: first-aid kit, a portable fire extinguisher having a rating of not less than 20:ABC, and a portable cellular telephone. Copies of pertinent figures including emergency phone numbers, and maps with hospital routes will be provide in SSHP

Emergency Contacts

These contacts and maps should be posted prominently at the site. Should any situation or unplanned occurrence require outside assistance or support services, the appropriate contact from the following list should be made:

Responsible Person	Telephone Number	
	Work	Home
Phil Nixon (Parsons ES Proj. Mgr.)	678-969-2430	770-831-8924
Parsons ES Site Mgr./ S&H Officer (TBD)	-	-
Fatima Zaidi (Parsons ES Project S&H Officer)	678-969-2352	678-377-0401
Medical Services Network (Dr. Mitchell)	1-800-874-4676, ext. 111	

13.2 GENERAL EMERGENCY PROCEDURES

General emergency procedures are as follows:

- Notify the emergency contacts listed in the SSHP when an emergency occurs. This list is posted prominently at the site.
- Use the "buddy" system (pairs).
- Maintain visual contact between "pairs." Each team member remains close to the other to assist in case of emergencies.

- If any member of the field crew experiences any adverse effects or symptoms of exposure, the entire field crew will immediately halt work and act according to the instructions provided by the Site Manager.
- Any condition that suggests a situation more hazardous than anticipated will result in evacuating the field team and reevaluating the hazard and the level of protection required.
- If an accident occurs, the Site Manager/SSHO is to complete an Accident Report Form (Appendix B). Follow-on action will be taken to correct the situation that caused the accident.

13.3 Site Specific Emergency Procedures

The site specific emergency contacts and route to medical facilities will be included in a Site Specific Safety & Health Plan addendum.

SECTION 14
STANDARD OPERATING PROCEDURES, ENGINEERING CONTROLS, AND SAFE WORK PRACTICES

14.1 GENERAL SAFETY

The following are considered standard safe work practices.

1. Eating, drinking, chewing tobacco, smoking, and carrying matches or lighters are prohibited in a contaminated or potentially contaminated area or where the possibility for contamination transfer exists.
2. Avoid contact with potentially contaminated substances or materials. Do not walk through puddles, pools, mud, or handle soils without protective gloves, etc. Avoid, whenever possible, kneeling on the ground, leaning or sitting on equipment or the ground. Do not place monitoring equipment on potentially contaminated surfaces (e.g., ground, etc.).
3. All field crew members should be alert to all potentially dangerous situations e.g., presence of strong, irritating, unusual, or nauseating odors.
4. Field crew members shall be familiar with the physical characteristics of a site during intrusive investigations, including:
   - Wind direction in relation to nearby buildings;
   - Accessibility to associates, equipment, vehicles, communication;
   - Hot zone (areas of known or suspected contamination);
   - Site access; and
   - Nearest water sources.
5. Protective equipment as specified in this SSHP will be used by workers during field activities.
6. Use of heavy equipment on-site, e.g., drilling rigs, presents additional hazards for site workers.
7. Wearing personal protective equipment can result in an impairment of the ability to operate site equipment. All field crew members should pay specific attention to decreased performance capabilities resulting from the use of personal protective equipment, such as poor tactile skills when wearing certain types of gloves. Prior knowledge of limitations imposed by the use of such equipment and clothing will allow the worker to assess the decrease in his or her capability to perform field operations in a safe manner.

8. Wearing of jewelry, such as rings and loose bracelets and necklaces, is prohibited in order to avoid its entanglement in site machinery.
9. Overhead power lines, downed electrical wires, and buried cables pose a danger of shock or electrocution if workers contact or sever them during site operations. The location of these potential hazards should be ascertained before beginning site activities.
10. Buddy system procedures will be enforced during field operations.
11. Field personnel will perform only those tasks which they are qualified to perform.
12. Site visitors are to be escorted by qualified personnel at all times.
13. Running and horseplay are prohibited in all areas of the site.
14. The number of personnel in the exclusion zone (EZ) will be the minimum number necessary to perform work tasks in a safe and efficient manner.

14.2 ORDNANCE SAFETY

Subcontractor at Curtis Bay Site screening out the UXOs will provide Health & Safety Plan pertaining to UXOs.

SECTION 15
TRAINING

15.1 OSHA TRAINING

15.1.1 As required by OSHA, Parsons employees receive 40 hours of initial off-site training and a minimum of 3 days of supervised field experience before being permitted to work at hazardous waste sites. Initial training, consisting of classroom lectures and field exercises, is performed by the Corporate Health and Safety staff. Site supervisors responsible for employees engaged in hazardous waste operations receive eight hours of additional training on managing such operations.

Field workers and on-site management personnel receive eight hours of refresher training annually, emphasizing the types of operations performed by those personnel. The training generally includes the following topics:

- Review of and retraining on relevant topics covered in the initial training;
- Updates on developments with respect to material covered in the initial training;
- Review of changes to pertinent provisions of EPA or OSHA standards or laws;
- Hands-on training of personal protective equipment and decontamination equipment;
- Review of newly developed air and contaminant monitoring equipment;
- Bloodborne Pathogens training (see Section 5.2.5); and
- Introduction of additional subject areas (i.e. First Aid, CPR, UXO) as appropriate.

In addition to the 40-hour initial training and 8-hour refresher training, a depot-specific briefing will be conducted by Field Manager/ SSHO. This briefing will cover the following topics:

- Names of personnel responsible for site safety and health;
- Safe work practices;
- Site history;
- Safety, health, and other hazards at site;
- Work zones and other locations;
- Emergency procedures, evacuation routes, emergency phone numbers;
- Proper use (e.g., donning and doffing) of personal protective equipment;
- Safe use of engineering controls and equipment on the site;
- Ordnance recognition and reporting; and
- Prohibitions in areas and zones, including:
    - Site layout, and

- Procedures for entry and exit of work areas and zones.

15.2 TAILGATE SAFETY MEETINGS

The Field Manager/SSHO is responsible for ensuring daily "tailgate" briefing is provided to all Parsons ES personnel and Parsons ES subcontractors under Parsons ES H&S supervision that are to work at the DNSC depots. The SSHO is also responsible for providing initial site-specific briefing for Parsons ES and subcontractor personnel who are on-site when non-intrusive tasks are being performed. This briefing will cover the following topics:

- Tasks to be performed;
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, or danger signals;
- Emergency procedures; and

15.3 TRAINING DOCUMENTATION

The Field Manager/SSHO will keep written documentation for all briefings given to personnel including personnel present and subjects covered. Documentation will be kept by Field Manager/SSHO for site-specific initial training, tailgate briefing/subjects, and any other special or additional training.

15.4 HAZARD COMMUNICATION

All project work will be conducted in accordance with Parsons ES's standard policies for hazard communication. Copies of Material Safety Data Sheets (MSDSs) for any chemicals brought on site will be maintained. Site orientation and training will be provided to all new employees brought on site and this will include an overview of all known hazards associated with the site. A copy of Parsons ES's hazard communication program for this site is contained in Appendix E.

15.5 UNEXPLODED ORDNANCE (UXO) TRAINING

Prior to beginning site activities (and as part of the initial site-specific training), orientation training will be provided in aspects of to Parsons ES and subcontractor personnel. HFA Environmental personnel will provide UXO recognition and awareness training which focuses on recognizing avoidance and reporting of UXO potentially present at the Curtis Bay depot .

15.6 BLOODBORNE PATHOGEN TRAINING

Personnel working at this site will be provided bloodborne pathogen briefing. This briefing will be given initially at the same time as the site specific initial briefing (paragraph 15.1). The topics covered in the tbriefing will include the following:

- An overview of the Bloodborne Pathogen Standard
- Epidemiology and symptoms of bloodborne diseases
- Modes of transmission of bloodborne pathogens
- A discussion of Exposure Control

- A discussion of tasks that may involve exposure to blood and other potentially infectious materials
- A review of the methods that will prevent or reduce exposure
- Selection and use of PPE

Information on the post-exposure evaluation and follow-up program

15.7 VISITOR TRAINING AND CONTROL

All visitors to the site will be given a H&S briefing prior to gaining access to the site. Following this briefing, visitors will be asked to sign SSHP - Plan Acceptance Forms. The Field Manager/SSHO will also ensure that visitors have applicable health and safety equipment, medical surveillance, and training for the activities/areas they will be visiting. Should questions arise as to whether or not specific training or equipment is needed - the Project Health and Safety Officer will be contacted.

APPENDIX A

AIR MONTIORING INSTRUMENT CALIBRATION & MAINTENANCE

A.1

PHOTOIONIZATION DETCETOR (10.2 eV)

A.1.0 GUIDELINE

The guideline for operational check, operation, and maintenance of Photoionization Detector (PID) is outlined below. Operational checks will be performed daily in accordance with the manufacture's instructions. The manufacturer's operation manual should be consulted for detailed instructions concerning the operation of various makes and models of photoionization meters.

A.1.1 Operational Check

1. Check to see that the batteries are sufficiently charged.
2. Confirm that the instrument is in the survey mode or read mode
3. Confirm that the previously entered standard gas value is consistent with the current gas value. Make adjustments as required.
4. Connect the standard calibrations gas bottle.
5. Turn the calibration gas cylinder on.
6. The reading should be close to the actual gas concentration. If not wait a few seconds and then repeat this process until the calibration gas has stabilized to 1-2 ppm with the calibration gas range.
7. Exit the calibration mode, turn off the gas and disconnect the calibration gas cylinder from instrument.

The calibration gas typically used for calibration is isobutylene at a concentration of 100 ppm. The use of this calibration gas will result in a reading of 100 ppm in the calibration mode.

A.1.2 Operations

1. Turn the instrument on.
2. Place sensor near the sample or location to be measured.
3. After the necessary measurements have been observed and recorded, turn the instrument off.

A.1.3 Preventive Maintenance

After daily use of the photoionization meter for field investigations, the unit shall be inspected and cleaned as necessary. The battery should be recharged daily (if needed) while in continuous use.

A.2
EBERLINE HP-260

A.2.0 PROCEDURE

The procedure for operation and maintenance of the Eberline HP-260 is outlined below. The operation manual supplied by the manufacturer should be consulted for instructions concerning the operation of various makes and models.

A.2.1 Operational Check

Background determination and instrument performance as described in this procedure shall be performed prior to the first use of the instrument each day or if sporadic readings occur. Prior to entering a radiological survey area, the instrument should be determined to be fully functional. The calibration controls shall not be adjusted in the field. An operational check shall be performed in the following manner:

1. Visually check the instrument for signs of physical damage and check the calibration status of the instrument.
2. Turn the instrument on.
3. Test the batteries to ensure that the instrument is functional by turning the dial to the "BATT" portion of the scale. The meter should deflect to the battery check portion of the meter scale.
4. Replace the batteries if they are dead and recheck.
5. Press the speaker button to the "ON" position.
6. Set the dial for the appropriate scale.
7. Use the designated beta source identified on the label located on the side of the instrument to determine if the instrument is functioning. Handle the check source by the outer rim only.
8. Place the source in contact with the middle portion of the detector probe.
9. Verify that the reading obtained corresponds to the beta source concentration.
10. If the reading is not within 20% refer to owner's manual for further action.

A.2.2 Procedure

1. Determine that the instrument is operational using the procedure listed above.
2. Perform the survey holding the instrument 0.5 inches from the surface to be measured.
3. Note and record reading.

A.2.3 Preventive Maintenance

The instrument will be checked daily for signs of physical damage. Calibration adjustments of the instrument shall be performed in a controlled environment by certified personnel.

APPENDIX B

EXAMPLE HEALTH & SAFETY FORMS FOR HEALTH & SAFETY ACTIVITIES

PLAN ACCEPTANCE FORM
SITE SAFETY AND HEALTH PLAN

I have read and agree to abide by the contents of the Safety and Health Plan for the following project:

_____

_____
Name (print)

_____
Signature

_____
Date

Return to Project Health and Safety Officer before work at the site.

EMPLOYER

1. Name: _____

2. Mail Address: _____
(No. and Street) (City or Town) (State and Zip)

3. Location :_____
(if different from mail address)

INJURED OR ILL EMPLOYEE

4. Name:_____Social Sec. No.:_____
(first) (middle) (last) Employee No:_____

5. Home Address: _____
(No. and Street) (City or Town) (State and Zip)

6. Age:_____ 7. Sex: male ( ) female ( )

8. Date of injury or illness: _____ Time of accident:_____

9. Occupation: _____
(specific job title, not the specific activity employee was performing at time of injury)

10. Department: _____
(enter name of department in which injured person is employed, even though they may have been temporarily working in another department at the time of injury)

THE ACCIDENT OR OCCUPATIONAL ILLNESS

11. Place of accident of exposure:_____
(No. and Street) (City or Town) (State and Zip)

12. Project: _____

13. Was place of accident or exposure on employer's premises? Yes ( ) No ( )

14 How did the accident occur? _____
(describe fully the events that resulted in the injury or occupational illness.

_____
Tell what happened and how. Name objects and substances involved. Give details on all factors that led to

_____
accident. Use separate sheet for additional space).

15. What was the employee doing when injured? _____
(be specific--was employee using tools or equipment

_____
or handling material?)

_____

16 WITNESS TO ACCIDENT _____
(Name) (Affiliation) (Phone No.)

_____
(Name) (Affiliation) (Phone No.)

17 Name the object or substance that directly injured the employee. _____
(for example, object that struck

_____
employee; the vapor or poison inhaled or swallowed; the chemical or radiation that irritated the skin; or in

_____
cases of strains, hernias, etc., the object the employee was lifting, pulling, etc.)

18. Did the accident result in employee fatality? Yes ( ) No ( )

19. Number of lost days ____/restricted workdays ____ resulting from injury or illness?

OTHER

20. Name and address of physician:_____
(No. and Street) (City or Town) (State and Zip)

21. If hospitalized, name and address:_____
(No. and Street) (City or Town) (State and Zip)

22. Initial diagnosis of injury/occupational illness: _____

Date of report: _____ Prepared by:_____

Official position:_____

23. Treatment rendered: ❒ first aid ❒ medical treatment

_____

_____

APPENDIX C
MATERIAL SAFETY DATA SHEETS

PARSONS

PARSONS INFRASTRUCTURE & TECHNOLOGY

ACCIDENT REPORT FOLLOW-UP

Employee:_____ Date of injury or illness: _____

ANALYSIS - What caused the accident. Why did it happen:

Primary cause:

_____

_____

_____

_____

_____

_____

Contributing factors:

_____

_____

_____

_____

_____

_____

PREVENTIVE/CORRECTIVE ACTION - State what will be done to prevent re-occurrence.

Immediate action:

_____

_____

_____

_____

_____

_____

Who is responsible _____ Completion date(s):_____

Long-term action:

_____

_____

_____

_____

_____

Who is responsible _____ Completion date(s):_____

Closed by _____

Facility Health and Safety Representative date

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MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ISOPROPYL ALCOHOL (90 - 100%)

MSDS Number: I8840 --- ***Effective Date: 09/08/97***

1. Product Identification

Synonyms: 2-Propanol; sec-propyl alcohol; isopropanol; sec-propanol; dimethylcarbinol
CAS No.: 67-63-0
Molecular Weight: 60.10
Chemical Formula: (CH3)2 CHOH
Product Codes:
J.T. Baker: 5082, 9080, U298
Mallinckrodt: 3027, 3031, 3032, 3035, 3037, 3043, 4359, 6569, H604, V073, V345, V555, V566

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Isopropyl Alcohol	67-63-0	90 - 100%	Yes
Water	7732-18-5	0 - 10%	No

3. Hazards Identification

Emergency Overview

WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 4 - Extreme (Flammable)
Reactivity Rating: 2 - Moderate
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
Inhalation of vapors irritates the respiratory tract. Exposure to high concentrations has a narcotic effect, producing symptoms of dizziness, drowsiness, headache, staggering, unconsciousness and possibly death.
Ingestion:
Can cause drowsiness, unconsciousness, and death. Gastrointestinal pain, cramps, nausea, vomiting, and diarrhea may also result. The single lethal dose for a human adult = about 250 mls (8 ounces).
Skin Contact:
May cause irritation with redness and pain. May be absorbed through the skin with possible systemic effects.
Eye Contact:
Vapors cause eye irritation. Splashes cause severe irritation, possible corneal burns and eye damage.
Chronic Exposure:
Chronic exposure may cause skin effects.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or impaired liver, kidney, or pulmonary function may be more susceptible to the effects of this agent.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Flash point: 12C (54F) CC
Autoignition temperature: 399C (750F)
Flammable limits in air % by volume:

lel: 2.0; uel: 12.7
Listed fire data is for Pure Isopropyl Alcohol.
Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Contact with strong oxidizers may cause fire or explosion. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.
Fire Extinguishing Media:
Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

J. T. Baker SOLUSORB(tm) solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Isopropyl Alcohol (2-Propanol):
-OSHA Permissible Exposure Limit (PEL):
400 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):
400 ppm (TWA), 500 ppm (STEL)
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing

dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are recommended materials.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.

Odor:
Rubbing alcohol.

Solubility:
Miscible in water.

Specific Gravity:
0.79 @ 20C/4C

pH:
No information found.

% Volatiles by volume @ 21C (70F):
100

Boiling Point:
82C (180F)

Melting Point:
-89C (-128F)

Vapor Density (Air=1):
2.1

Vapor Pressure (mm Hg):
44 @ 25C (77F)

Evaporation Rate (BuAc=1):
2.83

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Heat and sunlight can contribute to instability.

Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:
Will not occur.

Incompatibilities:

Heat, flame, strong oxidizers, acetaldehyde, acids, chlorine, ethylene oxide, hydrogen-palladium combination, hydrogen peroxide-sulfuric acid combination, potassium tert-butoxide, hypochlorous acid, isocyanates, nitroform, phosgene, aluminum, oleum and perchloric acid.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 5045 mg/kg; skin rabbit LD50: 12.8 gm/kg; inhalation rat LC50: 16,000 ppm/8-hour; investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Isopropyl Alcohol (67-63-0)	No	No	3
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to quickly evaporate. When released into the soil, this material may leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. When released into water, this material may biodegrade to a moderate extent. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.

Environmental Toxicity:

The LC50/96-hour values for fish are over 100 mg/l. This material is not expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ISOPROPANOL
Hazard Class: 3

UN/NA: UN1219
Packing Group: II
Information reported for product/size: 355LB

International (Water, I.M.O.)

Proper Shipping Name: ISOPROPANOL
Hazard Class: 3.2
UN/NA: UN1219
Packing Group: II
Information reported for product/size: 355LB

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Isopropyl Alcohol (67-63-0)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Isopropyl Alcohol (67-63-0)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Isopropyl Alcohol (67-63-0)	No	No	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Isopropyl Alcohol (67-63-0)	No	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): Yes CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2[S]2
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **2** Flammability: **3** Reactivity: **0**

Label Hazard Warning:
WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN.

Label Precautions:
Keep away from heat, sparks and flame.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid breathing vapor or mist.
Avoid contact with eyes, skin and clothing.

Label First Aid:
If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:
Laboratory Reagent.

Revision Information:
MSDS Section(s) changed since last revision of document include: 15.

Disclaimer:
****

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

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24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT J.T.Baker

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

MERCURY

MSDS Number: M1599 --- *Effective Date: 12/08/96*

1. Product Identification

Synonyms: Quicksilver; hydrargyrum; Liquid Silver
CAS No.: 7439-97-6
Molecular Weight: 200.59
Chemical Formula: Hg
Product Codes: J.T. Baker: 2564, 2567, 2569, 2572 Mallinckrodt: 1278, 1280, 1288

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Mercury	7439-97-6	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Mercury vapor is highly toxic via this route. Causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, headache, muscle weakness, anorexia, gastrointestinal disturbance, ringing in the ear, liver changes, fever, bronchitis and pneumonitis. Can be absorbed through inhalation with symptoms similar to ingestion.

Ingestion:
May cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea. May be followed by a rapid and weak pulse, shallow breathing, paleness, exhaustion, tremors and collapse. Delayed death may occur from renal failure. Gastrointenstinal uptake of mercury is less than 5% but its ability to penetrate tissues presents some hazard. Initial symptoms may be thirst, possible abdominal discomfort.

Skin Contact:
Causes irritaton and burns to skin. Symptoms include redness and pain. May cause skin allergy and sensitization. Can be absorbed through the skin with symptoms to parallel ingestion..

Eye Contact:
Causes irritation and burns to eyes. Symptoms include redness, pain, blurred vision; may cause serious and permanent eye damage.

Chronic Exposure:
Chronic exposure through any route can produce central nervous system damage. May cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of the teeth, digestive disorders, skin rashes, brain damage and kidney damage. Can cause skin allergies and accumulate in the body. Repeated skin contact can cause the skin to turn gray in color. A suspected reproductive hazard; may damage the developing fetus and decrease fertility in males and females.

Aggravation of Pre-existing Conditions:
Persons with nervous disorders, or impaired kidney or respiratory function, or a history of allergies or a known sensitization to mercury may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by

mouth to an unconscious person. Get medical attention immediately.

Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.

Explosion:
Not considered to be an explosion hazard.

Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Undergoes hazardous reactions in the presence of heat and sparks or ignition. Smoke may contain toxic mercury or mercuric oxide. Smoke may contain toxic mercury or mercuric oxide.

6. Accidental Release Measures

Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from vapor. Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate misting. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Do not flush to sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. J. T. Baker CINNASORB(tm) and RESISORB(tm) are recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Do not use or store on porous work surfaces (wood, unsealed concrete, etc.). Follow strict hygiene practices. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

% Volatiles by volume @ 21C (70F):
100

Boiling Point:
356.7C (675F)

Melting Point:
-38.87C (-38F)

Vapor Density (Air=1):
7.0

Vapor Pressure (mm Hg):
0.0018 @ 25C (77F)

Evaporation Rate (BuAc=1):
4

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
At high temperatures, vaporizes to form extremely toxic fumes.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Acetylenes, ammonia, ethylene oxide, chlorine dioxide, azides, metal oxides, methyl silane, lithium, rubidium, oxygen, strong oxidants, metal carbonyls.

Conditions to Avoid:
Heat, flames, ignition sources, metal surfaces and incompatibles.

11. Toxicological Information

Toxicological Data:
Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:
All forms of mercury can cross the placenta to the fetus, but most of what is known has been learned from experimental animals. See Chronic Health Hazards.

Carcinogenicity:
EPA / IRIS classification: Group D1 - Not classifiable as a human carcinogen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category

Mercury 7439-97-6	No	No	3

12. Ecological Information

Environmental Fate:
This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material is expected to significantly bioaccumulate.

Environmental Toxicity:
This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

International (Water, I.M.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

International (Air, I.C.A.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Mercury (7439-97-6)	Yes	Yes	No	Yes

-------- Chemical Inventory Status - Part 2 ----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Mercury (7439-97-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Mercury (7439-97-6)	No	No	Yes	No

-------- Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Mercury (7439-97-6)	1	U151	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

Prop 65:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 2Z
Poison Schedule: S7

WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: 3 **Flammability:** 0 **Reactivity:** 0

Label Hazard Warning:
DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

Label Precautions:
Do not get in eyes, on skin, or on clothing. Do not breathe vapor. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.

Product Use:
Laboratory Reagent.

Revision Information:
Pure. New 16 section MSDS format, all sections have been revised.

Disclaimer:
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Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

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MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
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National Response in Canada
CANUTEC: 613-996-6666

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Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

LEAD METAL

MSDS Number: L2347 --- *Effective Date: 12/08/96*

1. Product Identification

Synonyms: Granular lead, pigment metal; C.I. 77575
CAS No.: 7439-92-1
Molecular Weight: 207.19
Chemical Formula: Pb
Product Codes: J.T. Baker: 2256, 2266 Mallinckrodt: 5668

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Lead	7439-92-1	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.

Ingestion:
POISON! The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.

Skin Contact:
Lead and lead compounds may be absorbed through the skin on prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain.

Eye Contact:
Absorption can occur through eye tissues but the more common hazards are local irritation or abrasion.

Chronic Exposure:
Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. The symptoms of chronic exposure are like those of ingestion poisoning; restlessness, irritability, visual disturbances, hypertension and gray facial color may also be noted.

Aggravation of Pre-existing Conditions:
Persons with pre-existing kidney, nerve or circulatory disorders or with skin or eye problems may be more susceptible to the effects of this substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.

Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard. Powder/dust is flammable when heated or exposed to flame.

Explosion:
Not considered to be an explosion hazard.

Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Can produce toxic lead fumes at elevated temperatures and also react with oxidizing materials.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Areas in which exposure to lead metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For lead, metal and inorganic dusts and fumes, as Pb: -OSHA Permissible Exposure

Limit (PEL): 0.05 mg/m3 (TWA) For lead, elemental and inorganic compounds, as Pb: -ACGIH Threshold Limit Value (TLV): 0.05 mg/m3 (TWA), A3 animal carcinogen ACGIH Biological Exposure Indices (BEI): 30 ug/100ml, notation B (see actual Indices for more information). For lead, inorganic: -NIOSH Recommended Exposure Limit (REL): 0.1 mg/m3 (TWA)

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face high efficiency dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:
Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1025).

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9. Physical and Chemical Properties

Appearance:
Small, white to blue-gray metallic shot or granules.

Odor:
Odorless.

Solubility:
Insoluble in water.

Density:
11.34

pH:
No information found.

% Volatiles by volume @ 21C (70F):
0

Boiling Point:
1740C (3164F)

Melting Point:
327.5C (622F)

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
1.77 @ 1000C (1832F)

Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
Does not decompose but toxic lead or lead oxide fumes may form at elevated temperatures.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Ammonium nitrate, chlorine trifluoride, hydrogen peroxide, sodium azide, zirconium, disodium acetylide, sodium acetylide and oxidants.

Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicological Data:
Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:
Lead and other smelter emissions are human reproductive hazards. (Chemical Council on Environmental Quality; Chemical Hazards to Human Reproduction, 1981).

Carcinogenicity:
EPA / IRIS classification: Group B2 - Probable human carcinogen, sufficient animal

evidence.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Lead (7439-92-1)	No	No	2B

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to leach into groundwater. This material may bioaccumulate to some extent.

Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Lead (7439-92-1)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Lead (7439-92-1)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.

Lead (7439-92-1	No	No	Yes	No

-------- Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Lead (7439-92-1	10	No	No

Chemical Weapons Convention: No TSCA 12 (b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Prop 65:
THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: No information found.
Poison Schedule: S6

WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 **Flammability:** 1 **Reactivity:** 0

Label Hazard Warning:
POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

Label Precautions:
Do not get in eyes, on skin, or on clothing. Do not breathe dust. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:
Laboratory Reagent.

Revision Information:
Pure. New 16 section MSDS format, all sections have been revised.

Disclaimer:

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

CHROMIUM
Chrome
(powder)
Cr (metal)
Atomic mass: 52.0

CAS = 7440-47-3
RTECS # GB4200000
ICSC # 0029

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible if in very fine powder. Gives off irritating or toxic fumes (or gases) in a fire.	No open flames if in powder form.	In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
• SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
• EYES	Redness.	Face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place (extra personal protection: P2 filter respirator for harmful particles).	Fireproof. Separated from strong oxidants.	

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

I	PHYSICAL STATE; APPEARANCE: STEEL GREY LUTROUS METAL.	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.
M	PHYSICAL DANGERS:	

P O R T A N T D A T A	Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** Reacts violently with strong oxidants such as hydrogen peroxide, causing fire and explosion hazard. Reacts with diluted hydrochloric and sulfuric acids. Incompatible with alkalis and alkali carbonates. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV: ppm; 0.5 mg/m^3 (as TWA) (ACGIH 1994-1995).	**INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization.

PHYSICAL PROPERTIES	Boiling point: 2642°C Melting point: 1900°C	Relative density (water = 1): 7.14 Solubility in water: none
ENVIRONMENTAL DATA		

NOTES

Explosive limits are unknown in literature. Depending on the degree of exposure, periodic medical examination is indicated.

ADDITIONAL INFORMATION

ICSC: 0029 **CHROMIUM**

MATERIAL SAFETY DATA SHEET

BENZENE (AMOCO/TOTAL)

MSDS No. 11697000 ANSI/ENGLISH

1.0 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: BENZENE (AMOCO/TOTAL)

MANUFACTURER/SUPPLIER:

Amoco Oil Company
200 East Randolph Drive
Chicago, Illinois 60601 U.S.A.

EMERGENCY HEALTH INFORMATION:
1 (800) 447-8735

EMERGENCY SPILL INFORMATION:
1 (800) 424-9300 CHEMTREC (USA)

OTHER PRODUCT SAFETY INFORMATION:
(312) 856-3907

2.0 COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS#	Range % by Wt.
Benzene	71-43-2	99.80
Toluene	108-88-3	0.20

(See Section 8.0, "Exposure Controls/Personal Protection", for exposure guidelines)

3.0 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Danger! Extremely flammable. Causes eye and skin irritation. Inhalation causes headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness. Harmful or fatal if liquid is aspirated into lungs. Danger! Contains Benzene. Cancer hazard. Can cause blood disorders. Harmful when absorbed through the skin.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: Causes mild eye irritation.

SKIN CONTACT: Causes mild skin irritation. Causes skin irritation on prolonged or repeated

contact. Harmful when absorbed through the skin.

INHALATION: Cancer hazard. Can cause blood disorders. Inhalation causes headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness. See "Toxicological Information" section (Section 11.0).

INGESTION: Harmful or fatal if liquid is aspirated into lungs. See "Toxicological Information" section (Section 11.0).

HMIS CODE: (Health:2) (Flammability:3) (Reactivity:0)

NFPA CODE: (Health:2) (Flammability:3) (Reactivity:0)

4.0 FIRST AID MEASURES

EYE: Flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists.

SKIN: Wash exposed skin with soap and water. Remove contaminated clothing, including shoes, and thoroughly clean and dry before reuse. Get medical attention if irritation develops.

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

INGESTION: If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention.

5.0 FIRE FIGHTING MEASURES

FLASHPOINT: 12°F(-11°C)

UEL: 8.0%

LEL: 1.5%

AUTOIGNITION TEMPERATURE: 928°F (498°C)

FLAMMABILITY CLASSIFICATION: Extremely Flammable Liquid.

EXTINGUISHING MEDIA: Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, foam, steam) or water fog.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Extremely flammable liquid. Vapor may explode if ignited in enclosed area.

FIRE-FIGHTING EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus.

PRECAUTIONS: Keep away from sources of ignition (e.g., heat and open flames). Keep container closed. Use with adequate ventilation.

HAZARDOUS COMBUSTION PRODUCTS: Incomplete burning can produce carbon monoxide and/or carbon dioxide and other harmful products.

6.0 ACCIDENTAL RELEASE MEASURES

Remove or shut off all sources of ignition. Remove mechanically or contain on an absorbent material such as dry sand or earth. Increase ventilation if possible. Wear respirator and spray with water to disperse vapors. Keep out of sewers and waterways.

7.0 HANDLING AND STORAGE

HANDLING: Use with adequate ventilation. Do not breathe vapors. Keep away from ignition sources (e.g., heat, sparks, or open flames). Ground and bond containers when transferring materials. Wash thoroughly after handling. After this container has been emptied, it may contain flammable vapors; observe all warnings and precautions listed for this product.

STORAGE: Store in flammable liquids storage area. Store away from heat, ignition sources, and open flame in accordance with applicable regulations. Keep container closed. Outside storage is recommended.

8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE: Do not get in eyes. Wear eye protection.

SKIN: Do not get on skin or clothing. Wear protective clothing and gloves.

INHALATION: Do not breathe mist or vapor. If heated and ventilation is inadequate, use supplied-air respirator approved by NIOSH/MSHA.

ENGINEERING CONTROLS: Control airborne concentrations below the exposure guidelines.

EXPOSURE GUIDELINES:

Component	CAS#	Exposure Limits
Benzene	71-43-2	OSHA PEL: 1 ppm OSHA STEL: 5 ppm ACGIH TLV-TWA: 10 ppm
Toluene	108-88-3	OSHA PEL: 100 ppm (1989); 200 ppm (1971) OSHA STEL: 150 ppm (1989); Not established. (1971) OSHA Ceiling: 300 ppm (1971) ACGIH TLV-TWA: 50 ppm (skin)

9.0 CHEMICAL AND PHYSICAL PROPERTIES

APPEARANCE AND ODOR: Liquid. Colorless. Sweet odor.

pH: Not determined.

VAPOR PRESSURE: 74.6 mm Hg at 20 °C

VAPOR DENSITY: Not determined.

BOILING POINT: 176°F(80°C)

MELTING POINT: 42°F(6°C)

SOLUBILITY IN WATER: Slight, 0.1 to 1.0%.

SPECIFIC GRAVITY (WATER=1): 0.88

10.0 STABILITY AND REACTIVITY

STABILITY: Stable.

CONDITIONS TO AVOID: Keep away from ignition sources (e.g. heat, sparks, and open flames).

MATERIALS TO AVOID: Avoid chlorine, fluorine, and other strong oxidizers.

HAZARDOUS DECOMPOSITION: None identified.

HAZARDOUS POLYMERIZATION: Will not occur.

11.0 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY DATA:

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: 3.8 g/kg (rat).

INHALATION LC50: 10000 ppm (rat)

OTHER TOXICITY DATA: Acute toxicity of benzene results primarily from depression of the central nervous system (CNS). Inhalation of concentrations over 50 ppm can produce headache, lassitude, weariness, dizziness, drowsiness, or excitation. Exposure to very high levels can result in unconsciousness and death.

Long-term overexposure to benzene has been associated with certain types of leukemia in humans. In addition, the International Agency for Research on Cancer (IARC) and OSHA consider benzene to be a human carcinogen. Chronic exposures to benzene at levels of 100 ppm and below have been reported to cause adverse blood effects including anemia. Benzene exposure can occur by inhalation and absorption through the skin.

Inhalation and forced feeding studies of benzene in laboratory animals have produced a carcinogenic response in a variety of organs, including possibly leukemia, other adverse effects on the blood, chromosomal changes and some effects on the immune system. Exposure to benzene at levels up to 300 ppm did not produce birth defects in animal studies; however, exposure to the higher dosage levels (greater than 100 ppm) resulted in a reduction of body weight of the rat pups (fetotoxicity). Changes in the testes have been observed in mice exposed to benzene at 300 ppm, but reproductive performance was not altered in rats exposed to benzene at the same level.

Aspiration of this product into the lungs can cause chemical pneumonia and can be fatal. Aspiration into the lungs can occur while vomiting after ingestion of this product. Do not siphon by mouth.

12.0 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product.

13.0 DISPOSAL INFORMATION

Disposal must be in accordance with applicable federal, state, or local regulations. Enclosed-controlled incineration is recommended unless directed otherwise by applicable ordinances. Residues and spilled material are hazardous waste due to ignitability.

14.0 TRANSPORTATION INFORMATION

U.S. DEPT OF TRANSPORTATION

Shipping Name	Benzene
Hazard Class	3
Identification Number	UN1114
Packing Group	II
RQ	RQ

INTERNATIONAL INFORMATION:

Sea (IMO/IMDG)

Shipping Name Not determined.

Air (ICAO/IATA)

Shipping Name Not determined.

European Road/Rail (ADR/RID)

Shipping Name Not determined.

Canadian Transportation of Dangerous Goods

Shipping Name Not determined.

15.0 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is reportable under 40 CFR Part 302.4 because it contains the following substance(s):

Component/CAS Number	Weight %	Component Reportable Quantity (RQ)
Benzene 71-43-2	99.80	10 lbs.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTIONS 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370): This product is defined as hazardous by OSHA under 29 CFR Part 1910.1200(d).

SARA TITLE III SECTION 313 (40 CFR Part 372): This product contains the following substance(s), which is on the Toxic Chemicals List in 40 CFR Part 372:

Component/CAS Number	Weight Percent
Benzene 71-43-2	99.80

U.S. INVENTORY (TSCA): Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Flammable liquid. Carcinogen. Irritant. CNS Effects. Target organ effects.

EC INVENTORY (EINECS/ELINCS): In compliance.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

16.0 OTHER INFORMATION

Prepared by:

Environment, Health and Safety Department

Issued: November 14, 1995

This material Safety Data Sheet conforms to the requirements of ANSI Z400.1.

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

APPENDIX D
MEDICAL SURVEILLANCE, CONTROL/ACCESS TO EMPLOYEE MEDICAL RECORDS, AND EMERGENCY CARE

APPENDIX D
MEDICAL SURVEILLANCE, CONTROL/ACCESS TO EMPLOYEE MEDICAL RECORDS, AND EMERGENCY CARE

INTRODUCTION

The medical surveillance program is a major element in the Parsons ES Health and Safety Program. The three major components of the medical surveillance program are: (1) routine medical monitoring of the health of Parsons ES personnel whose work may expose them to health hazards, (2) arrangements for emergency medical care in the event of a work-related injury, and (3) maintenance of employee medical records.

MEDICAL SURVEILLANCE

Enrollment Criteria

A medical examination is essential to assess and monitor a worker's health and fitness both before placement and during the course of work. The criteria for medical surveillance enrollment is dependent upon the employee's exposure potential. An employee whose work involves the regular, potential exposure to toxic substances or physical agents above established OSHA permissible exposure limits (PELs), OSHA action levels, or American Conference of Governmental Industrial Hygienist (ACGIH) threshold limit values (TLV) shall be enrolled in the medical surveillance program. Examples of operations where employee enrollment would be necessary include.

- field investigations or remedial operations at gasoline stations or bulk storage terminals;
- field investigations in a designated exclusion zone;
- work requiring respirator usage;
- laboratory use of hazardous substances;
- asbestos or lead sampling or abatement;
- stack sampling and source evaluation operations; and
- industrial wastewater and process water characterization surveys.

An employee assigned to a task where there is no reason to believe there is a potential for exposure above OSHA PELs, OSHA action levels, or ACGIH TLVs would be exempt from the medical surveillance program. Examples of exempted operations would include the following:

- project management oversight from support zone;

- site visits/walk overs without ground disturbance;
- geotechnical and land surveys without ground disturbance;
- property transfer audits where there is no environmental sampling;
- laboratory operations confined to dip and read tests; and
- ecological surveys.

Medical Oversight Contractor

Parsons ES has hired a medial oversight contractor (MOC) to manage its medical surveillance program. The MOC is Medical Services Network (MSN), 2625 Cumberland Parkway, Suite 320, Atlanta, Georgia 30339, phone: 800-874-4676. The responsibilities of the MOC are:

- develop medical examination protocols specific to Parsons ES operations;
- contract local clinics;
- issue employee medical reports to the Facility Health and Safety Representative;
- track personnel enrolled in medical monitoring program; and
- archive employee medical and exposure records.

The MOC provides Parsons ES with consistency in examination content and quality.

Clinic Selection

The Parsons ES MOC or the Facility Health and Safety Representative perform initial clinic selection. Only after MOC approval may the clinic be used by Parsons ES. The Corporate Health and Safety Manager, Mr. Edward Grunwald is co-located in the Atlanta office and can be contacted with questions concerning medical monitoring - 678-969-2394. The clinic used for medical monitoring and records. Maintenance for the Parsons ES Atlanta office is located in Atlanta, Georgia and operated by MSN – 404-333-1090.

Pre-Placement Screening

All employees who will be involved in the medical surveillance program have an initial physical examination before assignment to work requiring regular health monitoring. The pre-placement screening has two major functions: (1) to determine the employee's fitness for duty, including the ability to work while wearing protective equipment and (2) to establish a baseline physiological profile for comparison with future medical data. The physical examination will be given by an approved clinic and will follow the examination protocol established by the MOC.

Periodic Examinations

Physical examinations are repeated annually for personnel involved in HAZWOPER projects such as those at DNSC depots. Records of project personnel working at DNSC

depots will be checked to ensure that periodic examination has occurred within the last year.

Termination Examination

A physical examination shall be performed as a part of the checkout procedure for terminating employees. The content of this examination shall comply with the protocol established by the MOC.

Special Examination

Special medical examinations and counseling will be provided in cases of known or suspected exposure to a toxic substance above its occupational exposure limit. Special testing must be approved by the Project H&S Officer and Corporate H&S Manager after consulting the MOC physician.

Information Provided to the Examining Physician

Each employee participating in the medical surveillance program will present to the examining physician a completed History and Physical Form at the time of the examination. The History and Physical Form is designed to elicit information necessary for the physician to understand the employee's past and current health status. Additionally, the form provides an opportunity for the employee to express possible concerns about his or her occupational environment.

Medical Examination Reports

Data obtained during the examination is sent to the MOC physician for analysis. After reviewing the data, the MOC physician submits a report to the Parsons ES Atlanta Health and Safety Representative. This report contains the following information:

- physician's opinion of the employee's fitness to perform their assigned duties;
- any recommended limitations upon the employee's assigned duties; and
- statement that the employee has been informed of the physician's findings and of any medical conditions that require further examination or treatment.

Additionally, the employee receives a report from the MOC physician that discusses all aspects and findings of the medical examination.

Disposition of Medical Records of Terminated Employees

When an employee is terminated from Parsons ES, the MOC shall seal the employee's medical file for archiving. The medical file will be maintained in the custody of the MOC for 30 years after the employee's termination date.

Confidentiality of Reports

The medical report that is submitted to the Office Health and Safety Representative or Corporate Health and Safety Manager shall not reveal any specific findings or diagnoses unrelated to occupational exposures, illnesses, or accidents. The physician's

report shall be kept in the custody of the Office Health and Safety Representative in a locked file separate from the employee's personnel records. Access to the physician's report shall be limited to the Corporate Health and Safety Manager and the Office Health and Safety Representative unless authorized in writing by the employee or except where the opinions are required for settlement of workers' compensation claims.

Subcontractor's Medical Certification

Subcontractors assigned to work at the former Camp Sibert sites are required to furnish the Project Manager or Project Health and Safety Officer a doctor's certification of each assigned employee's ability to wear personal protective equipment. The certification should be dated not more than 1 year before the employee begins on-site work.

EMERGENCY MEDICAL CARE

Emergency treatment is integrated into the Emergency Response and Fire Prevention Plan. This plan requires posting of the name, a map showing its location, phone number, and address of the nearest emergency care center. In addition, phone numbers and procedures for contacting fire, police and ambulance services are included in the emergency response portions of this plan. The Emergency Response and Fire Prevention Plan designates roles and responsibilities to be assumed by personnel in an emergency. At least two members of the field team will be currently certified in cardiopulmonary resuscitation (CPR) and first aid.

A map with directions to the nearest medical facility will be posted at the worksite. All field Managers/personnel working at the site should know the location of the nearest medical facility. The Site Health and Safety Officer will report all incidents requiring emergency medical attention to the Project Health and Safety Officer or Corporate Health and Safety Manager.

APPENDIX E
HAZARD COMMUNICATION PROGRAM

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INTRODUCTION

The OSHA Hazard Communications Standard (29 CFR 1910.1200) was promulgated to ensure that all chemicals would be evaluated and information regarding the associated chemical hazards would be communicated to employers and employees. The goal of the standard is to reduce the number of chemically related occupational illnesses and injuries.

In order to comply with the OSHA Hazard Communication Standard, this written program has been established by Parsons ES for work at the DNSC depots, AL. All Parsons ES and subcontractor personnel working at DNSC depots are included in this program. Copies of this written program will be available for review by any employee at DNSC depots - by contacting the SSHO or from the PSHO:

Fatima M. Zaidi
Parsons Engineering Science, Inc.
5390 Triangle Parkway
Norcross, GA 30092
678-969-2352

HAZARDOUS CHEMICAL INVENTORY LIST

Hazardous chemicals used at DNSC depots include: toxic metals such as lead, and mercury; volatile organic compounds (site specific); ionizing radiation (site specific). The SSHO will maintain an inventory of hazardous chemicals brought onto DNSC depot.

HAZARD DETERMINATION

The most hazardous chemicals potentially present at DNSC depots are mercury vapors (site specific), ionizing radiation. These chemicals are toxic, Parsons ES will therefore rely upon the hazard information contained in the MSDSs . Copies of these MSDSs are included in Appendix C of this GSHP.

MATERIAL SAFETY DATA SHEETS (MSDS)

MSDSs are prepared by manufacturers or producers to provide specific information on the safety precautions and health effects of a particular chemical or mixture. The MSDS contains at a minimum the following information:

- Chemical and common names
- Physical and chemical characteristics

- Physical hazards
- Health hazards
- Primary routes of entry
- Exposure limits
- Carcinogenic potential
- Handling and protective precautions
- Control measures
- Emergency and first aid procedures
- Date of MSDS preparation
- Name and address of manufacturer

A complete file of MSDSs for all hazardous chemicals to which an employee of Parsons ES may be exposed will be kept in labeled files on-site. MSDSs are located in Appendix C of this Safety and Health Plan. In the event that a MSDS is missing the employee should immediately contact the SSHO or PSHO.

LABELS AND OTHER FORMS OF WARNING

The Hazard Communication Standard requires that hazardous chemicals be labeled by manufacturers. The label must contain the following:

- Chemical identity
- Appropriate warnings
- Name and address of manufacturer, importer, or other responsible party.

If the labels are incomplete or missing, Parsons ES personnel will refuse the shipment.

When chemicals are transferred from the manufacturer's container's to secondary containers, the Site Manager or SSHO will ensure that the containers are labeled with the identity of the chemicals and appropriate hazard warnings. Labels for secondary containers can be obtained from the SSHO.

The entire labeling procedure will be reviewed at least annually and changed as necessary.

EMPLOYEE INFORMATION AND BRIEFING

Prior to starting work Parsons ES and its subcontractors' employees will attend a site specific safety and health briefing. This briefing will include Hazard Communication Briefing to review the contents of this program and learn the hazards associated with each listed hazardous chemical. The briefing will be performed by Site Manager/SSHO.

6.1. Training Topics

The site training or HAZCOM will include:

- An overview of the requirements of the Hazard Communication Standard;
- The labeling system and how to use it;
- How to review MSDS and where they are kept;
- Chemicals present in work operations;
- Physical and health effects of hazardous chemicals;
- Methods and observation techniques used to determine the presence or release of hazardous chemicals in the area;
- Personal protective equipment and work practices to reduce or prevent exposure to chemicals;
- Steps to be taken to prevent or reduce exposure to chemicals;
- Safety-emergency procedures to follow if exposure occurs; and
- Location and availability of written program/MSDSs.

Following the training session(s), each employee will sign and date the training record. Additional training may be provided by the SSHO with the introduction of each new hazardous chemical. Records of additional training will be maintained.

ON-SITE CONTRACTORS AND VISITORS

Parsons ES understands that at times other persons may be on the work site. New contractors, subcontractors and visitors will be required to attend site health and safety briefing to familiarize them with the contents of this document and the specific hazards associated with DNSC depots. New contractors, subcontractors and visitors will be provided with the following information:

- Hazardous chemicals to which the contractor's employees or visitors may be exposed;
- Precautions necessary to protect employees during normal operating conditions and foreseeable emergencies; and
- Labeling system used in the work place.

It is the responsibility of the Site Manager/SSHO to ensure that all MSDSs of chemicals to which the contractor's employees or visitors may be exposed are made available at a central location in the work place along with an example of the labeling system in use. Visitors and subcontractors will be informed of the availability of this information and its location.

PROGRAM REVIEW

This written hazard communications program for Parsons ES will be reviewed by the PSHO or Corporate Health and Safety Manager at least annually and updated as necessary.

Reviewed and Approved:

Project Safety and Officer Health: _____

Site Manager: _____