NPL-U29-2-11-R8

HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: Jacobs Smelter
EPA ID No. UT0002391472

Contact Persons

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Pathways, Components, or Threats Not Scored

Ground Water Migration Pathway

The Jacob Smelter/Stockton study area is sparsely populated, with most individuals receiving their drinking water from municipal sources and not from localized ground water aquifers drawn within a four mile radius. The effects of the surficial soil contamination on area ground water was not evaluated. Based on the lack of data and a limited number of targets, the Ground Water pathway has not been scored as part of this Hazard Ranking System (HRS) package.

Surface Water Migration Pathway

The most prominent surface water feature subject to site contamination in this area is Rush Lake; however, the lake is located over one mile west of the area of documented soil contamination and there were no identified drinking water intakes along the 15-mile target distance limit. To date, the likelihood of site contaminants migrating from the Jacobs Smelter area to fisheries and wetlands associated with Rush Lake has not been evaluated. The Surface Water pathway has not been scored as part of this HRS package.

Air Migration Pathway

There are insufficient data to satisfy HRS requirements for establishing an observed release of hazardous substances to the air in the Jacobs Smelter study area. The Air Migration pathway has not been scored as part of this HRS package.

JACOBS SMELTER
Stockton, Utah

The Jacobs Smelter site covers over three acres in northeast and southwest Stockton, Utah. In 1998, the Utah Department of Environmental Quality collected 29 soil and sediment samples from residential yards, fields, and former smelting locations in the Rush Lake area of Tooele County situated to the south of Tab Hill. These samples were collected to determine if a threat to human health existed in the area from historical smelting operations. Analysis of the soil and sediment samples indicated levels of arsenic and lead to be present at concentrations of 30,400 milligrams per kilogram (mg/kg) and 68,400 mg/kg, respectively. The discovery of these concentrations prompted the need to further investigate the extent of arsenic and lead present in soils in this region of the Rush Lake Valley.

Historically, the Rush Lake/Stockton area was a major smelting center for this part of Utah, receiving and milling ore from most of the mines in the valley. As many as nine smelters could have operated in the Rush Lake Valley, but only four have been positively located: the Waterman, Chicago, Carson-Buzzo, and the Jacobs. All operated in the study area from the 1860s through the turn of the century refining gold, silver, copper, lead, and zinc. The nearest of these smelters to the study area was the Jacobs Smelter.

Subsequent investigations were performed by the Bureau of Reclamation in conjunction with several government contractors. These investigations included the collection of a total of 5,296 surface soil samples from 252 parks, residences, and lots in Stockton. Using an X-Ray Fluorescence Spectrometer in the field, the majority of samples were found to contain concentrations of arsenic above the analytical target level of 100 mg/kg, or the lead analytical target level of 400 mg/kg. Samples were sent for laboratory confirmation, and the data resulting from the laboratory analysis were used to delineate an area of observed arsenic contamination in surface soils encompassing at least three acres.

An evaluation of residences within the area of observed soil contamination indicates that there are an estimated 62 residences subject to arsenic concentrations exceeding the Cancer Risk Screening Concentration, Health Based Benchmark. In addition, there are 18 residences on which a release of lead has been documented.

[The description of the site (release) is based on information available at the time the site was scored. The description may change as additional information is gathered on the sources and extent of contamination. See 56 FR 5600, February 11, 1991, or subsequent FR notices.]

HRS DOCUMENTATION RECORD

Name of Site: Jacobs Smelter

EPA Region: Region VIII

Date Prepared: May 15, 1999

Street Address of Site: Near the intersection of Smith and Johnson Streets

City, County, State: Stockton, Tooele County, Utah

General Location in the State: The Jacobs Smelter site is located in Stockton, approximately seven miles southwest of the Town of Tooele, and 40 miles southwest of Salt Lake City, in the north-central portion of the state.

Topographic Map: Stockton, Utah, 7.5 minute quadrangle (Ref. 3).

Latitude: 40 ° 27 ' 15.0 " North

Longitude: 112 ° 21 ' 30.0 " West

(Ref. 4)

Scores	
Air Pathway	0.00
Ground Water Pathway	0.00
Soil Exposure Pathway	100.00
Surface Water Pathway	0.00
HRS SITE SCORE	50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	NS	—
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	NS	
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS	
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	NS	—
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	100	10,000
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	—
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		10,000
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root	50.00	

NS - Not Scored

TABLE 5-1
SOIL EXPOSURE PATHWAY SCORE SHEET

	Factor Categories and Factors	Maximum Value	Value Assigned
	RESIDENT POPULATION THREAT		
	Likelihood of Exposure		
1.	Likelihood of Exposure	550	550
	Waste Characteristics		
2.	Toxicity	a	10,000
3.	Hazardous Waste Quantity	a	10
4.	Waste Characteristics	100	18
	Targets		
5.	Resident Individual	50	50
6.	Resident Population		
	6a. Level I Concentrations	b	1,984
	6b. Level II Concentrations	b	58
	6c. Resident Population (lines 6a + 6b)	b	2,042
7.	Workers	15	0
8.	Resources	5	0
9.	Terrestrial Sensitive Environments	c	0
10.	Targets (lines 5 + 6c + 7 + 8 + 9)	b	2,092
	Resident Population Threat Score		
11.	Resident Population Threat (lines 1 x 4 x 10)	b	20,710,800

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to maximum to 60.
d Do not round to nearest integer.
NS-Not Scored

TABLE 5-1
SOIL EXPOSURE PATHWAY SCORE SHEET
(continued)

	Factor Categories and Factors	Maximum Value	Value Assigned
	NEARBY POPULATION THREAT		
	Likelihood of Exposure		
12.	Attractiveness/Accessibility	100	0
13.	Area of Contamination	100	0
14.	Likelihood of Exposure	500	NS
	Waste Characteristics		
15.	Toxicity	a	0
16.	Hazardous Waste Quantity	a	0
17.	Waste Characteristics	100	NS
	Targets		
18.	Nearby Individual	1	0
19.	Population Within 1 Mile	b	0
20.	Targets (lines 18 + 19)	b	NS
	Nearby Population Threat Score		
21.	Nearby Population Threat (lines 14 x 17 x 20)	b	NS
	SOIL EXPOSURE PATHWAY SCORE		
	Soil Exposure Pathway Score[d]		
22.	(S_s), (lines [11 + 21] ÷ 82,500 subject to a maximum of 100)	100	100

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to maximum to 60.
d Do not round to nearest integer.
NS-Not Scored

REFERENCES

Ref. No.	Description of the Reference
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System, 40 CFR Part 300, Appendix A, 55 FR 51533. December 14, 1990. 1 page, excerpt.
2.	U.S. Environmental Protection Agency (EPA). Superfund Chemical Data Matrix. June 1996. 95 pages.
3.	U.S. Geological Survey (USGS). 7.5-minute Series Topographic Quadrangle Maps of : Stockton, Utah, 1980, 1:24,000 scale. 1 map (modified).
4.	U.S. Environmental Protection Agency (EPA). Latitude and Longitude Calculation Worksheet. 1 page.
5.	Utah Department of Environmental Quality. 1998. Preliminary Assessment and Site Inspection Analytical Results Report, Jacobs Smelter, Tooele County, Utah. December 8, 1998. 31 pages.
6.	Tullidge, Edward W. 1889. Tullidge's Histories, Volume II. Juvenile Instructor Press, Salt Lake City, Utah. 3 pages, excerpt.
7.	URS Operating Services, Inc. (UOS). 1999. Logbook 392, Documentation of Site Reconnaissance and Project Notes, Jacobs Smelter, UOS Project 75-90122.00. April, 1999. 13 pages, excerpt.
8.	United States Department of the Interior, Geological Survey. 1932. Geology and Ore Deposits of the Stockton and Fairfield Quadrangles, Utah. Professional Paper 173. 18 pages, excerpt.
9.	United States Department of the Interior, Census Office. 1885. Statistics and Technology of the Precious Metals, Washington, Government Printing Office. 5 pages, excerpt.
10.	Stoughton, B., and Butts, A. 1926. Engineering Metallurgy, A Textbook For Users Of Metals. McGraw-Hill Book Company, New York, New York. 441 pages.
11.	URS Operating Services, Inc. (UOS). 1999. Sampling Analysis Report for the Removal Site Assessment, Jacobs Smelter Stockton Soils, TDD 9806-0015, March 26, 1999. 199 pages.
12.	URS Operating Services, Inc. (UOS). 1999. Appendix B, Laboratory Data and Validation Reports, Confirmation samples submitted by UOS for the Jacobs Smelter Stockton Soils Investigation, March 26, 1999. 732 pages.
13.	ISSI, Inc., 1999. GIS Map depicting Areas of Observed Arsenic and Lead Contamination based on laboratory analytical results for the Jacobs Smelter Residential Soils Investigation. 1 sheet.
14.	URS Operating Services, Inc. (UOS). 1999. Memorandum to File by Rebecca Laramie (LT Corp.), subject: Background samples from Jacobs Smelter. 1 page.
15.	Shacklette, Hansford T., and Boerngen, Josephine G. 1984. Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States. United States Geological Survey Professional Paper 1270. 105 pages.

16. Utah Department of Environmental Quality, (UDEQ) DERR, Various dates, Inorganic Background Soil Data, Salt Lake City Area, Compiled From APA Site Inspections, 140 pages.

17. United States Department of Commerce, Bureau of Census. 1990. Census of Population and Housing, Summary Population and Housing Characteristics, Colorado. 104 pages.

18. Office of Solid Waste and Emergency Response (OSWER). 1996. Directive 9285.7-14FS, Using Qualified Data To Document An Observed Release, November, 1996. 18 pages.

19. UOS. 1999. Printout of Integrated Jacob Smelter Database showing ID No., Lab Results for Observed Release Quantities, Street Address, Sampling Date, and property owner.

20. URS Greiner Woodward Clyde. 1999. Email from Chris Stotler to Rebecca Laramie (LT Corp.), subject: Jacobs Smelter- Base Drawing Information. June 18, 1999. 1 page.

21. Tooele County Recorders Office, June 25, 1999. Telephone conversation of Joann Torres with Bryan Williams (TTEMI), subject: Tooele County Maps. 1 page.

22. Galson Laboratories. 1999. Summary Data Package for URS Operating Services, Inc. Project: Jacobs Smelter. 2 pages, excerpt.

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Name of source: Lead and Arsenic Contaminated Soil (North Area) Number of source: 1

Source Type: Contaminated Surface Soils

Description of Source:

A number of smelters have operated in the Stockton area over the years; however, only four of the larger ones have been located in the study area: the Waterman, the Chicago, the Carson- Buzzo, and the Jacobs. Of these, only the Jacobs was located in town, the others being found almost one mile to the southwest and topographically downgradient (Ref. 5, pp. 1-2; 7, pp. 8-10). Construction on the Jacobs smelter was completed in 1872 by the Lilly Leisenring & Company and production began on a small rise just northeast of town (Refs. 6, p. 77; 7, p. 2). The Jacobs used a single stack with three vertical blast furnaces below to handle ores brought primarily from the Kearsage, Honorine, and 4th of July Mines (Refs. 6, p. 77; 8, p. 119; 9, p. 449). In 1879 the smelter was purchased by the Great Basin Mining and Smelting Company who installed large concentrator jigs capable of milling 100 tons of ore a day. Jacobs began reducing up to 25 tons of ore a day, turning out 5.5 tons of bullion which assayed at 100 ounces of silver per ton (Refs. 8, p. 119; 9, p. 447). There is no record of when the Jacobs smelter ceased operations; however, interviews with residents of Stockton indicate that no smelters were in operation or still standing as of 1914 (Ref. 7, pp. 3-4). In all smelting processes, it is not possible to completely separate the desired metal from the dross, and a portion is lost in the slag, in the flue dust, and some in the exhaust gases (Ref. 10, p. 92). Some of the major impurities in lead bullion are gold, silver, copper, arsenic, and zinc, valuable by-products in their own right (Ref. 10, p. 314).

Lead ores mined in Utah during the latter part of the 19th century were classified as primary ores, or those containing as much as 20% to 30% lead, and secondary ores which typically had a lead concentration of 10% to 20%. Smelting technology at that time was still developing in the Rush Valley, and it was difficult to smelt secondary ores unless they were "concentrated" or "jigged"; that is, put through a series of screens and crushers which would concentrate the mineral (Ref. 7, pp. 8-9). Typically, mines in the area would ship the primary ores to the smelter, and stockpile the secondary ores on site until the primary played out, or until out of room to store the secondary ores at the mine (Ref. 7, pp. 12-13). Both types of ores were hauled to the smelter by wagon through town to the Jacob Smelter site where they would be piled then gravity fed into the furnaces or jigs. Although it is possible that some aerial deposition occurred from the Jacob stack, the high concentrations found along the runoff pathways and the historical routes into town from the mines supports runoff and human action as the causes of deposition (Ref. 7, pp. 5-8, 10).

Three additional smelting and refining operations have been identified in the Stockton area, where operations similar to those of the Jacobs took place: the Waterman, the Chicago, and the Carson-Buzzo (Refs. 5, p. 2; 6, p. 77; 8, p. 119; 9, p. 450). Although the site of the former Jacobs smelter is quite close to Highway 36 and is located within the town limits of Stockton, the area has seen little travel or commerce during the emergency response action (Refs. 3; 5, p. 2). A background sample collected south and east of the Jacobs smelter area is considered to reflect metal concentrations in the immediate study area yet outside the influence of the smelters (Ref. 5, pp. 5, 6, 8, 10).

The Utah Department of Environmental Quality (UDEQ) collected 29 soil and sediment samples and 5 surface water samples from the Stockton area in 1997. Sample collection included soils from the Waterman Smelter site, Chicago Smelter site, Carson-Buzzo Smelter site, and Jacobs Smelter site. These samples were analyzed for total metals and indicated the presence of lead and arsenic concentrations as great as 68,400 milligrams per kilogram (mg/kg) and 30,400 mg/kg, respectively. The 1998 sampling activities focused on the Jacobs Smelter site where lead and arsenic concentrations were detected at levels as high as 68,400 mg/kg and 6,550 mg/kg, respectively (Refs. 5, pp. 25-31; 11, pp. 1, 2).

The discovery of these concentrations prompted the need to further investigate the extent of arsenic and lead present in soils in this region of Tooele County.

The additional investigation conducted by the Bureau of Reclamation (BOR) and Environmental Protection Agency (EPA) contractors included the collection of a total of 5,296 surface soil samples (collected from less than two feet below ground surface (bgs)) from 252 parks, residences, or lots in Stockton (Refs. 11, pp. 2-3, Figure 2; 12).

The results of the laboratory confirmation samples were utilized to delineate an area of approximately three acres of surficial arsenic and lead soil contamination (Ref. 13).

Location of the source, with reference to a map of the site:

The area of contaminated soils covers the majority of the northern portion of the Town of Stockton; more specifically, an area bounded on the west by the sand and gravel bar west of Highway 36, the north by Kings Way, the east by Rogers Street, and the south by Silver Avenue and includes the site of the former Jacob Smelter (Refs. 3; 11, Figure 2; 12).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

Hazardous Substance	Evidence		References
	Station Location Nº	Laboratory Sample Nº	
Arsenic	J1392C18 (9,790 mg/kg)	L45711-5	12, p. 131
Lead	J1931A18 (110,000 mg/kg)	L46650-10	12, p. 562

Source Background Sample Information/Association

The soil samples listed above were collected during the 1998 Jacobs Smelter sampling effort conducted by BOR. Analytical results from soil samples submitted to the laboratory indicate the presence of arsenic concentrations in surface soils (0 to 2 feet bgs) ranging from 87.6 mg/kg (lowest concentration for establishing significance above background) to a maximum of 9,790 mg/kg, and lead concentrations up to 110,000 mg/kg (Refs. 11, Table 1; 12). This area of contamination is delineated based on a comparison of confirmation sample results to the background arsenic level of 19.9 mg/kg and background lead concentration of 163 mg/kg collected during the sampling event (Refs. 12, p. 573; 13).

Sample locations with significantly elevated concentrations are displayed on Reference 13. These coordinates, in conjunction with the laboratory analytical data, were utilized to derive the area of contaminated soil as shown on Reference 13.

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1 Hazardous Constituent Quantity

Hazardous Constituent Quantity Assigned Value: NE

2.4.2.1.2 Hazardous Wastestream Quantity

Hazardous Wastestream Quantity Assigned Value: NE

2.4.2.1.3 Volume

Volume Assigned Value: NE

2.4.2.1.4 Area

Description

Surface soil samples indicate the presence of arsenic and lead at levels significantly above background as defined in the HRS Table 2-3. The area of surface soil contamination (Refs. 11; 12) covers an expanse of 143,131.61 square feet (Ref. 13).

The assigned area value as follows Section 2.4.2 and Table 5-2 of the HRS (Ref. 1):

$$143{,}131.61/34{,}000 = 4.21$$

Area Assigned Value: 4.21

2.2.1 Source Identification

Name of source: Lead and Arsenic Contaminated Soil (South Area) Number of source: 2

Source Type: Contaminated Surface Soils

Description of Source:

A number of smelters have operated in the Stockton area over the years; however, only four of the larger ones have been located in the study area: the Waterman, the Chicago, the Carson- Buzzo, and the Jacobs. Of these, only the Jacobs was located in town, the others being found almost one mile to the southwest and topographically downgradient (Ref. 5, pp. 1-2; 7, pp. 8-10). Construction on the Jacobs smelter was completed in 1872 by the Lilly Leisenring & Company and production began on a small rise just northeast of town (Refs. 6, p. 77; 7, p. 2). The Jacobs used a single stack with three vertical blast furnaces below to handle ores brought primarily from the Kearsage, Honorine, and 4th of July Mines (Refs. 6, p. 77; 8, p. 119; 9, p. 449). In 1879 the smelter was purchased by the Great Basin Mining and Smelting Company who installed large concentrator jigs capable of milling 100 tons of ore a day. Jacobs began reducing up to 25 tons of ore a day, turning out 5.5 tons of bullion which assayed at 100 ounces of silver per ton (Refs. 8, p. 119; 9, p. 447). There is no record of when the Jacobs smelter ceased operations; however, interviews with residents of Stockton indicate that no smelters were in operation or still standing as of 1914 (Ref. 7, pp. 3-4). In all smelting processes, it is not possible to completely separate the desired metal from the dross, and a portion is lost in the slag, in the flue dust, and some in the exhaust gases (Ref. 10, p. 92). Some of the major impurities in lead bullion are gold, silver, copper, arsenic, and zinc, valuable by-products in their own right (Ref. 10, p. 314).

Lead ores mined in Utah during the latter part of the 19th century were classified as primary ores, or those containing as much as 20% to 30% lead, and secondary ores which typically had a lead concentration of 10% to 20%. Smelting technology at that time was still developing in the Rush Valley, and it was difficult to smelt secondary ores unless they were "concentrated" or "jigged"; that is, put through a series of screens and crushers which would concentrate the mineral (Ref. 7, pp. 8-9). Typically, mines in the area would ship the primary ores to the smelter, and stockpile the secondary ores on site until the primary played out, or until out of room to store the secondary ores at the mine (Ref. 7, pp. 12-13). Both types of ores were hauled to the smelter by wagon through town to the Jacob Smelter site where they would be piled then gravity fed into the furnaces or jigs. Although it is possible that some aerial deposition occurred from the Jacob stack, the high concentrations found along the runoff pathways and the historical routes into town from the mines supports runoff and human action as the causes of deposition (Ref. 7, pp. 5-8, 10).

Three additional smelting and refining operations have been identified in the Stockton area, where operations similar to those of the Jacobs took place: the Waterman, the Chicago, and the Carson-Buzzo (Refs. 5, p. 2; 6, p. 77; 8, p. 119; 9, p. 450). Although the site of the former Jacobs smelter is quite close to Highway 36 and is located within the town limits of Stockton, the area has seen little travel or commerce during the emergency response action (Refs. 3; 5, p. 2). A background sample collected south and east of the Jacobs smelter area is considered to reflect metal concentrations in the immediate study area yet outside the influence of the smelters (Ref. 5, pp. 5, 6, 8, 10).

The Utah Department of Environmental Quality (UDEQ) collected 29 soil and sediment samples and 5 surface water samples from the Stockton area in 1997. Sample collection included soils from the Waterman Smelter site, Chicago Smelter site, Carson-Buzzo Smelter site, and Jacobs Smelter site. These samples were analyzed for total metals and indicated the presence of lead and arsenic concentrations as great as 68,400

milligrams per kilogram (mg/kg) and 30,400 mg/kg, respectively. The 1998 sampling activities focused on the Jacobs Smelter site where lead and arsenic concentrations were detected at levels as high as 68,400 mg/kg and 6,550 mg/kg, respectively (Refs. 5, pp. 25-31; 11, pp. 1, 2).

The discovery of these concentrations prompted the need to further investigate the extent of arsenic and lead present in soils in this region of Tooele County.

The additional investigation conducted by the Bureau of Reclamation (BOR) and Environmental Protection Agency (EPA) contractors included the collection of a total of 5,296 surface soil samples (collected from less than two feet below ground surface (bgs)) from 252 parks, residences, or lots in Stockton (Refs. 11, pp. 2-3, Figure 2; 12).

The results of the laboratory confirmation samples were utilized to delineate an area of approximately three acres of surficial arsenic and lead soil contamination (Ref. 13).

Location of the source, with reference to a map of the site:

The area of contaminated soils lies in the southwestern part of the town, south of Silver Avenue and almost entirely west of Highway 36 (Refs. 11, Figure 1; 12).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

Hazardous Substance	Evidence		References
	Station Location Nº	Laboratory Sample Nº	
Arsenic	J2742A06 (1,920 mg/kg)	L46656-4	12, p. 704
Lead	J2742A06 (27,600 mg/kg)	L46656-4	12, p. 704

Source Background Sample Information/Association

Analytical results from soil samples submitted to the laboratory indicate the presence of arsenic concentrations in surface soils (0 to 2 feet bgs) ranging from 87.6 mg/kg to a maximum of 9,790 mg/kg, and lead concentrations up to 110,000 mg/kg (Refs. 11, Table 1; 12). This area of contamination is delineated based on a comparison of sample results to the background arsenic level of 19.9 mg/kg and background lead concentration of 163 mg/kg collected during the sampling event (Refs. 11; 12, p. 573).

Sample locations with significantly elevated concentrations are displayed on Reference 13. These coordinates, in conjunction with the laboratory analytical data, were utilized to derive the area of contaminated soil as shown on Reference 13.

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1 Hazardous Constituent Quantity

Hazardous Constituent Quantity Assigned Value: NE

2.4.2.1.2 Hazardous Wastestream Quantity

Hazardous Wastestream Quantity Assigned Value: NE

2.4.2.1.3 Volume

Volume Assigned Value: NE

2.4.2.1.4 Area

Description

Surface soil samples indicate the presence of arsenic and lead at levels significantly above background as defined in the HRS Table 2-3. The area of surface soil contamination has not been completely characterized for this source, although several samples were identified as being at elevated levels by a comparison of these samples to established background levels (Refs. 11; 12).

Area Assigned Value: >0

2.4.2.1.5 Source Hazardous Waste Quantity Value

Highest assigned value assigned from Table 2-5: >0

SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Y/N)	Available to Pathway (X)				
			Ground Water (GW)	Surface Water (SW)		Air	
				Overland/Flood	GW to SW	Gas	Particulate
1	4.21	N	NS	NS	NS	NS	NS
2	>0	N	NS	NS	NS	NS	NS
Total	4.21						

NS-Not Scored

2.4.2.2 Hazardous Waste Quantity Factor Value

According to Table 2-6 in the HRS Final Rule, based on a source hazardous waste quantity value of 4.21, the hazardous waste quantity factor value is 10 (Ref. 1, Table 2-6, p. 51592)

Source Hazardous Waste Quantity Factor Value: 10

5.0 SOIL EXPOSURE PATHWAY

5.0.1 GENERAL CONSIDERATIONS

Letter by which this area is to be identified: A

Name of area: Arsenic and lead contaminated soils

Location and description of area (with reference to a map of the site): Two areas of contaminated soils are found in the Stockton area; the northern area is bounded on the west by the sand and gravel bar west of Highway 36, on the north by Kings Way, on the east by Rogers Street, and on the south by Silver Avenue (Refs. 3; 10, Figure 2; 13).

Letter by which this area is to be identified: B

Name of area: Arsenic and lead contaminated soils

Location and description of area (with reference to a map of the site): The southern area of contaminated soil lies in the southwestern part of the town, south of Silver Avenue and almost entirely west of Highway 36 (Refs. 10, Figure 2; 13).

It should be noted that these two areas are similar in both contaminants present and the method in which they became contaminated. Less than 100 feet separates them at their nearest points. Insufficient sampling has been performed in area B, however, to adequately characterize the source associated with it.

- Background Concentrations:

In 1998, BOR, in conjunction with the EPA Region VIII Superfund Technical Assistance Response Team (START) collected a sample from location J2044 to serve as a background from a location south and east of the former Jacobs Smelter site (Refs. 12, p. 573; 14). Soil sample location J2044 is considered representative of local background conditions due to its location outside of the apparent area of contaminant deposition, and its proximity to the former Jacobs Smelter site. The arsenic level in sample J2044E06 was reported at 19.9 mg/kg (Ref. 11, p. 573). Further, Shacklette (1984) has shown arsenic concentrations in the Tooele valley area to be lower than those used in this package (Ref. 15, p. 18). In addition, UDEQ has compiled a table of inorganic background soil values for the Salt Lake City area that shows a mean value for arsenic at 14.90 mg/kg (Ref. 16, p. 4). As such, the background concentration used for scoring purposes will be the highest of these values, 19.9 mg/kg.

The lead result for sample J2044E06 was reported as 163 mg/kg (Ref. 12, p. 573). Other samples collected from the background area show values that are consistent with this number. As such, this value will be used for the lead background. The table on the following page summarizes these data.

Three additional smelting and refining operations have been identified in the Stockton area: the Waterman, the Chicago, and the Carson-Buzzo, where operations similar to those of the Jacobs took place (Refs. 5, page 2; 6, p. 77; 8, p. 119; 9, p. 450). Although the site of the former Jacobs Smelter is quite close to Highway 36 and is located within the town limits of Stockton, the area has seen little travel or commerce during the emergency response fieldwork (Refs. 3; 5, p. 2). A background sample collected south and east of the Jacobs Smelter area is considered to be reflective of the immediate study area (Ref. 5, pp. 5, 6, 8, 10).

Sample ID	Sample Medium	Depth	Date	Reference
J2044E06	surface soil	6 inches bgs	10/2/98	11, pp. 2,3; 12, p. 573

Sample ID	Hazardous Substance	Concentration (mg/kg)	Instrument Detection Limit (IDL) (μg/l)	Reference
Shacklette	Arsenic	10	N/A	15, p. 18
UDEQ	Arsenic	14.90	N/A	16, p. 4
J2044E06	Arsenic	19.9	4	12, p. 573
UDEQ	Lead	101.36	N/A	16, p. 4
J2044E06	Lead	163	1	12, p. 573

- Level I Contaminated Samples

Surface Soil, <2 ft. bgs, all samples show concentration of arsenic.

Sample ID	Date	Concentration of arsenic (mg/kg)		IDL (μg/l)†	Reference
			(Conv.)*		
Area Letter A:					
J0052E18 136 E. Silver Ave.	8/31/98	136	-	4	12, p. 189; 13; 14
J0142C18 70 E. Silver Ave.	9/29/98	71.9	-	4	12, p. 458; 13; 14
J0481E18 30 N. Roger St.	9/22/98	153	-	4	12, p. 214; 13; 14
J0532E18 124 E. Clark St.	10/5/98	193	-	4	12, p. 469; 13; 14
J0542D06 52 N. Johnson St.	9/21/98	192	-	4	12, p. 490; 13; 14

Sample ID	Date	Concentration of arsenic (mg/kg)		IDL (μg/l)†	Reference
			(Conv.)*		
J0552E18 44 N. Johnson St.	9/4/98	407	-	4	12, p. 221; 13; 14
J0591D18 35 N. Johnson St.	10/5/98	60.8	-	4	12, p. 493; 13; 14
J0621D06 40 N. Sheridan St.	9/11/98	114	-	4	12, p. 233; 13; 14
J0661C06 69 E. Silver Ave.	9/15/98	99.1	-	4	12, p. 240; 13; 14
J0701B12 37 N. Sheridan St.	9/10/98	76.8	-	4	12, p. 245; 13; 14
J0762E18 42 N. Connor Ave.	8/28/98	341	-	4	12, p. 36; 13; 14
J0771A06 32 N. Connor Ave.	8/28/98	1,870	-	4	12, p. 37; 13; 14
J0791E06 24 N. Connor Ave.	8/28/98	715	-	4	12, p. 256; 13; 14
J0841F06 43 N. Connor Ave.	8/28/98	386	-	4	12, p. 259; 13; 14
J0891C18 29 W. Clark St.	9/2/98	118	-	4	12, p. 261; 13; 14
J0921A06 29 W. Silver Ave.	8/28/98	216	-	4	12, p. 496; 13; 14
J0992F18 40 W. Clark St.	9/28/98	1,190	-	4	12, p. 508; 13; 14
J1011A18 91 N. Connor Ave.	9/28/98	662	-	4	12, p. 507; 13; 14
J1031A18 113 N. Connor Ave.	9/8/98	285	-	4	12, p. 268; 13; 14
J1051F12 129 N. Connor Ave.	9/8/98	194	-	4	12, p. 291; 13; 14
J1071F18 10 E. Smith St.	8/27/98	860	-	4	12, p. 86; 13; 14

Sample ID	Date	Concentration of arsenic (mg/kg)		IDL (µg/l)†	Reference
			(Conv.)*		
J1081B18 128 N. Connor Ave.	8/27/98	243	-	4	12, p. 87; 13; 14
J1091A06 116 N. Connor Ave.	8/27/98	99.7	-	4	12, p. 89; 13; 14
J1112B12 94 N. Connor Ave.	8/27/98	197	-	4	12, p. 94; 13; 14
J1152C18 97 N. Sheridan St.	9/3/98	276	-	4	12, p. 300; 13; 14
J1161A18 115 N. Sheridan St.	9/3/98	82.4	-	4	12, p. 303; 13; 14
J1191C18 124 N. Sheridan St.	8/18/98	124	-	4	12, p. 504; 13; 14
J1242E12 79 N. Johnson St.	9/3/98	194	-	4	12, p. 319; 13; 14
J1252D12 91 N. Johnson St.	9/4/98	212	-	4	12, p. 322; 13; 14
J1262E18 107 N. Johnson St.	8/19/98	115	-	4	12, p. 111; 13; 14
J1334F12 212 N. Sheridan St.	8/17/98	770	-	4	12, p. 525; 13; 14
J1381A06 158 N. Sheridan St.	8/18/98	4,810	-	4	12, p. 125; 13; 14
J1392C18 174 N. Sheridan St.	8/17/98	9,790	-	4	12, p. 131; 13; 14
J1402F06 188 N. Sheridan St.	8/17/98	1,130	-	4	12, p. 135; 13; 14
J1411C18 194 N. Sheridan St.	8/17/98	203	-	4	12, p. 137; 13; 14
J1422D06 36 E. Dutch Ave.	8/20/98	127	-	4	12, p. 141; 13; 14
J1472E12 37 E. Smith Ave.	8/19/98	6,430	-	4	12, p. 152; 13; 14

Sample ID	Date	Concentration of arsenic (mg/kg)		IDL (µg/l)†	Reference
			(Conv.)*		
J1492E06 182 N. Connor Ave.	8/27/98	1,870	-	4	12, p. 157; 13; 14
J1501D06 194 N. Connor Ave.	9/10/98	209	-	4	12, p. 353; 13; 14
J1511A12 206 N. Connor Ave.	8/27/98	99.3	-	4	12, p. 160; 13; 14
J1522D12 220 N. Connor Ave.	8/27/98	97.3	-	4	12, p. 164; 13; 14
J1611F12 231 N. Connor Ave.	9/11/98	154	-	4	12, p. 339; 13; 14
J1661B06 273 N. Connor Ave.	10/2/98	198	-	4	12, p. 539; 13; 14
J1842F12 263 N. Johnson St.	10/6/98	66.4	-	4	12, p. 559; 13; 14
J2282C06 41 N. Sherman Ave.	9/2/98	1,320 J	758.62	4	12, p. 583; 13; 14
J2291B06 66 W. Silver Ave.	9/2/98	138 J	79.31	4	12, p. 584; 13; 14
J2311F18 65 N. Sherman Ave.	9/17/98	2,070 J	1,189.65	4	12, p. 593; 13; 14
J2331C18 76 W. Clark St.	9/17/98	107	-	4	12, p. 602; 13; 14
J2352C18 75 W. Silver Ave.	9/17/98	139	-	4	12, p. 613; 13; 14
J2541E18 80 W. Silver Ave.	9/23/98	3,870	-	4	12, p. 643; 13; 14
J2881E12 241 N. 7th Street	10/2/98	83.9	-	4	12, p. 722; 13; 14
J2921F18 122 E. Dutch Ave.	10/5/98	109	-	4	12, p. 728; 13; 14
Area Letter: B					
J1931A18 147 S. Grant St.	9/29/98	1,620	-	4	12, p. 562; 13; 14

Sample ID	Date	Concentration of arsenic (mg/kg)		IDL (µg/l)†	Reference
			(Conv.)*		
J2472F12 146 W. Railroad St.	9/23/98	444	-	4	12, p. 629; 13; 14
J2531F12 224 S. Old County Rd.	9/24/98	64.5	-	4	12, p. 637; 13; 14
J2562B12 72 W. Silver Ave.	9/17/98	326	-	4	12, p. 651; 13; 14
J2611F18 110 S. Don't Walk St.	9/25/98	768	-	4	12, p. 660; 13; 14
J2641A12 138 Old County Rd.	9/25/98	500 J	287.35	4	12, p. 684; 13; 14
J2724A12 155 W. Railroad St.	9/25/98	137 J	78.73	4	12, p. 697; 13; 14
J2742A06 288 S. Old County Rd.	9/24/98	1,920	-	4	12, p. 704; 13; 14
J2841B12 60 S. Plaza St.	9/23/98	269	-	4	12, p. 713; 13; 14
J2862B06 213 Connor Ave.	9/29/98	1,130	-	4	12, p. 719; 13; 14

* J values shown in the contaminated samples table have been converted using multipliers found in the EPA quick reference sheet "Using Qualified Data to Document an Observed Release" (Ref. 18).

† Instrument Detection Limits (IDLs) supplied by Galson Laboratories for non-CLP analysis by contract to UOS (Ref. 22, p. 34).

- Level II Contaminated Samples

Surface Soil, <2 ft. bgs, all samples show concentration of lead.

Sample ID	Date	Concentration of lead (mg/kg)		IDL (µg/l)†	Reference
			(Conv.)*		
Area Letter: A					
J0071F18 30 S. Rogers St.	8/31/98	784	-	1	12, p. 191; 13; 14
J0261F12 42 E. Silver Ave.	10/1/98	902	-	1	12, p. 461; 13; 14
J0561C06 32 N. Johnson St.	9/21/98	509	-	1	12, p. 491; 13; 14
J0581E18 75 E. Silver Ave.	9/1/98	984	-	1	12, p. 223; 13; 14
J0602B12 45 N. Johnson St.	9/16/98	2,720	-	1	12, p. 225; 13; 14
J1101C06 110 N. Connor Ave.	8/27/98	865 J	600.69	1	12, p. 92; 13; 14
J1131A12 37 E. Clark St.	9/3/98	935	-	1	12, p. 295; 13; 14
J1631C12 262 N. Sherman Ave.	9/11/98	1,850	-	1	12, p. 342; 13; 14
J1642A06 280 N. Sherman Ave.	9/11/98	544	-	1	12, p. 343; 13; 14
J1681A12 238 N. Connor Ave.	8/27/98	564	-	1	12, p. 168; 13; 14
J1702E12 270 N. Connor Ave.	8/21/98	1,670	-	1	12, p. 175; 13; 14
J1732A12 33 E. Dutch Ave.	9/11/98	493	-	1	12, p. 348; 13; 14
J1761A18 248 N. Sheridan St.	8/20/98	804	-	1	12, p. 180; 13; 14

Sample ID	Date	Concentration of lead (mg/kg)		IDL (μg/l)†	Reference
			(Conv.)*		
J1831A18 251 N. Johnson St.	10/6/98	1,330	-	1	12, p. 550; 13; 14
J1872F18 314 N. Connor Ave.	8/20/98	1,290	-	1	12, p. 360; 13; 14
J1922E12 140 S. Grant St.	9/30/98	491	-	1	12, p. 560; 13; 14
J2651A12 126 S. Old County Rd.	9/25/98	910	-	1	12, p. 686; 13; 14
Area Letter: B					
J2584A06 244 Old County Rd.	9/24/98	1,070	-	1	12, p. 654; 13; 14

* J values shown in the contaminated samples table have been converted using multipliers found in the EPA quick reference sheet "Using Qualified Data to Document an Observed Release" (Ref. 18)

† Instrument Detection Limits (IDLs) supplied by Galson Laboratories for non-CLP analysis by contract to UOS (Ref. 22, p. 34).

Attribution

A comparison of soil samples to background samples collected during the 1998 sampling event resulted in the delineation of an area of arsenic and lead contaminated soils encompassing an estimated 114,505 square feet after subtracting the paved area found within the areas of contamination (Refs. 3; 4; 7, p. 11). The area of contaminated soils was delineated by comparing the site soil samples to the background arsenic concentration of 19.9 mg/kg and lead background of 163 mg/kg (Refs. 10; 11).

A number of smelters have operated in the Stockton area over the years; however, only four of the larger ones have been located in the study area: the Waterman, the Chicago, the Carson- Buzzo, and the Jacobs. Of these, only the Jacobs was located in town, the others being found almost one mile to the southwest and topographically downgradient (Ref. 5, pp. 1-2; 7, pp. 8-10). Construction on the Jacobs Smelter was completed in 1872 by the Lilly Leisenring & Company and production began on a small rise just northeast of town (Refs. 6, p. 77; 7, p. 2). The Jacobs used a single stack with three vertical blast furnaces below to handle ores brought primarily from the Kearsage, Honorine, and 4th of July Mines (Refs. 6, p. 77; 8, p. 119; 9, p. 449). In 1879 the smelter was purchased by the Great Basin Mining and Smelting Company who installed large concentrator jigs capable of milling 100 tons of ore a day. Jacobs began reducing up to 25 tons of ore a day, turning out 5.5 tons of bullion which assayed at 100 ounces of silver per ton (Refs. 8, p. 119; 9, p. 447). There is no record of when the Jacobs Smelter ceased operations; however, interviews with residents of Stockton indicate that no smelters were in operation or still standing as of 1914 (Ref. 7, pp. 3-4). In all smelting processes, it is not possible to completely separate the desired metal from the dross, and a portion is lost in the slag, in the flue dust, and some in the exhaust gases (Ref. 10, p. 92). Some of the major impurities in lead bullion are gold, silver, copper, arsenic, and zinc, valuable by-products in their own right (Ref. 10, p. 314).

Lead ores mined in Utah during the latter part of the 19th century were classified as primary ores, or those containing as much as 20% to 30% lead, and secondary ores which typically had a lead concentration of 10% to 20%. Smelting technology at that time was still developing in the Rush Valley, and it was difficult to smelt secondary ores unless they were "concentrated" or "jigged"; that is, put through a series of screens and crushers which would concentrate the mineral (Ref. 7, pp. 8-9). Typically, mines in the area would ship the primary ores to the smelter, and stockpile the secondary ores on site until the primary played out, or until out of room to store the secondary ores at the mine (Ref. 7, pp. 12-13). Both types of ores were hauled to the smelter by wagon through town to the Jacob Smelter site where they would be piled then gravity fed into the furnaces or jigs. Although it is possible that some aerial deposition occurred from the Jacob stack, the high concentrations found along the runoff pathways and the historical routes into town from the mines supports runoff and human action as the causes of deposition (Ref. 7, pp. 5-8, 10).

Three additional smelting and refining operations have been identified in the Stockton area, where operations similar to those of the Jacobs took place: the Waterman, the Chicago, and the Carson-Buzzo (Refs. 5, p. 2; 6, p. 77; 8, p. 119; 9, p. 450). Although the site of the former Jacobs smelter is quite close to Highway 36 and is located within the town limits of Stockton, the area has seen little travel or commerce during the emergency response action (Refs. 3; 5, p. 2). A background sample collected south and east of the Jacobs smelter area is considered to reflect metal concentrations in the immediate study area yet outside the influence of the smelters (Ref. 5, pp. 5, 6, 8, 10).

The Utah Department of Environmental Quality (UDEQ) collected 29 soil and sediment samples and 5 surface water samples from the Stockton area in 1997. Sample collection included soils from the Waterman Smelter site, Chicago Smelter site, Carson-Buzzo Smelter site, and Jacobs Smelter site. These samples were analyzed for total metals and indicated the presence of lead and arsenic concentrations as great as 68,400

milligrams per kilogram (mg/kg) and 30,400 mg/kg, respectively. The 1998 sampling activities focused on the Jacobs Smelter site where lead and arsenic concentrations were detected at levels as high as 68,400 mg/kg and 6,550 mg/kg, respectively (Refs. 5, pp. 25-31; 11, pp. 1, 2).

The discovery of these concentrations prompted the need to further investigate the extent of arsenic and lead present in soils in this region of Tooele County.

The additional investigation conducted by the Bureau of Reclamation (BOR) and Environmental Protection Agency (EPA) contractors included the collection of a total of 5,296 surface soil samples (collected from less than two feet below ground surface (bgs)) from 252 parks, residences, or lots in Stockton (Refs. 11, pp. 2-3, Figure 2; 12).

The Union Pacific Railroad owns the rail line that runs through Stockton, but it was originally constructed as a narrow gauge line by the Utah & Nevada Railway in 1870. The line changed to standard gauge in 1905 when it was purchased by the Los Angeles & salt Lake Railroad. During this time, the line was used to ship lead and silver bullion to Salt Lake City and secondary ores east for smelting (Ref. 5, p. 5). In addition, State Highway 36 runs north-northeast to south-southwest through town (Ref. 4). Both could be potential contributors to the lead contamination in Stockton; there is no reason to believe they contributed to the presence of arsenic.

Area of Contamination Hazardous Waste Quantity

- Hazardous Constituent Quantity:
  Are the data complete for Hazardous constituent quantity for this area? NO

  Hazardous Constituent Quantity Assigned Value: 0

- Hazardous Wastestream Quantity:
  Are the data complete for Hazardous Wastestream quantity for this area? NO

  Sum (pounds): NA
  Wastestream Quantity/5,000 (Table 5-2): NA

  Hazardous Wastestream Quantity Assigned Value: 0

- Volume:
  Are the data complete for Hazardous volume for this area? NO

  Sum (yd^3/gal): NA
  Equation for Assigning Value (Table 5-2): NA

  Volume Assigned Value: 0

- Area: A

Description

The total area of observed soil contamination encompasses an expanse of 143,131 square feet (Refs. 3, Table 5; 4; 13); however, of this area an estimated 28,626 square feet is paved (Ref. 7, p. 11). Per table 5-2 of the HRS (Ref. 1) the hazardous waste quantity is determined as follows: 143,131 square feet - 28,626 square feet = 114,505/34,000 = 3.36. Because Level I and Level II contamination has been documented (Ref. 1, p. 51592, Section 2.4.2.2), the assigned hazardous waste quantity factor value, per HRS Table 2-6, is 10.

Source Type	Units (ft^2)	References
Contaminated Surface Soils	114,505	7, p. 11

Sum (ft^2):114,505
Equation for Assigning Value (Table 5-2): 3.36<10, presence of actual contamination; 10

Area Assigned Value: 10

- Area: B

Description

Surface soil samples indicate the presence of arsenic and lead at levels significantly above background as defined in the HRS Table 2-3. The area of surface soil contamination has not been completely characterized for this source, although several samples were identified as being at elevated levels by a comparison of these samples to established background levels (Refs. 11; 12).

Source Type	Units (ft^2)	References
Contaminated Surface Soils	>0	1, Table 5-2

Sum (ft^2):>0
Equation for Assigning Value (Table 5-2): >0 is less than 10, presence of actual contamination; 10

Area Assigned Value: 10

5.1 RESIDENT POPULATION THREAT

Hazardous Substance	Evidence		References
	Station Location No.	Laboratory Sample ID No.	
Lead	J1931A18 147 S. Grant St.	L46650-10	Refs. 12, p. 562; 13; 14
Arsenic	J1392C18 174 N. Sheridan St.	L45711-5	Refs. 12, p. 131; 13; 14

Observed Release samples were selected from the Jacob Smelter Access Database for laboratory verified concentrations of lead and arsenic, as well as sample ID, street address, property owner, and the date each sample was collected (Ref. 19). Addresses without street numbers are vacant lots. Sample location "J" numbers from the database correlate with Reference 11 Figure 2; the emergency response sample location map. The Figure 2 map was generated using a Recorded Tooele County Public Map and was keyed by ground control survey to the aerial digital information (Refs. 20, 21). Every sample in this documentation record was collected within 200 feet of a residence and on properties no greater than 200 feet on a side (Refs 11, Figure 2; 19, 20, 21). Analysis of sample J1392C18 indicated an arsenic concentration of 9,790 mg/kg in surface soils (collection depth < 2 feet bgs). From a total of 503 surface soil samples (all samples collected from < 2 feet bgs), more than 62 exhibited arsenic contamination at levels meeting the criteria for significance above background, and 18 met the requirements for significance above background regarding lead. All of the samples with street addresses were collected from residential properties within 200 linear feet of the primary residence (Refs. 3; 4; 11, Figure 2; 13).

5.1.1 LIKELIHOOD OF EXPOSURE

The presence of arsenic and/or lead contamination in concentrations meeting observed contamination requirements on residential property within 200 feet of the primary dwelling establishes a resident population threat for the site. Because no property was greater in length or width than 200 feet, all samples were within the target distance limit; in addition, fencing, localized topography, and landscaping and maintenance practices were used to confirm the property owner's statements regarding their property boundaries (Refs. 1, Section 5.1, p. 51646; 3; 4; 7; 11, Figure 2; 13).

Resident Population Threat Likelihood of
Exposure Factor Category Value: 550

5.1.2 WASTE CHARACTERISTICS

5.1.2.1 Toxicity

Hazardous Substance	Toxicity Factor Value	Reference
Arsenic	10,000	2, p. B-2
Lead	10,000	2, p. B-13

Toxicity Factor Value: 10,000

5.1.2.2 Hazardous Waste Quantity

Area Letter	Source Type	Area Hazardous Waste Quantity
A	Contaminated Soil	10
B	Contaminated Soil	10

Sum of Values: 20

Hazardous Waste Quantity Factor Value: 10
(Table 2-6)

5.1.2.3 Calculation of Waste Characteristics Factor Category Value

Toxicity Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 10

Toxicity Factor Value x Hazardous Waste Quantity Factor Value: 100,000

Waste Characteristics Factor Category Value: 18
(Table 2-7)

5.1.3 TARGETS

5.1.3.1 Resident Individual

Level of Contamination (Level I/Level II): Level I

There are 62 residential soil samples that exhibit Level I arsenic contamination within the Jacobs smelter study area. These samples delineate an area of observed soil contamination and document the presence of Level I soil contamination at each residence. These samples were all collected on the resident individual's property and within 200 linear feet of the residence; therefore, a resident individual factor of 50 is assigned.

References: 1, Section 5.1.3.1, p. 51647; 19

Resident Individual Factor Value: 50

5.1.3.2 Resident Population

5.1.3.2.1 Level I Concentrations

Area Letter	Sample ID	Number of Residences	County Multiplier	No. of Residents
A	See Level I Contaminated Samples Table, pp. 15-20 of this HRS package	52	3.2	166.4
B	See Level I Contaminated Samples Table, p. 20 of this HRS package	10	3.2	32.0

Sum of individuals subject to Level I concentrations: 198.4
Sum of individuals subject to Level I concentrations x 10: 1,984

Analysis from residential surface soil samples collected from the Jacobs Smelter study area indicate the presence of arsenic at levels three times the background concentration or greater, and exceeding the cancer risk screening concentration at 62 residences (Refs. 2, p. B-65; 19). U.S. Department of Commerce, Bureau of Census data (Ref. 17, p. 30) indicates that there are an average of 3.2 individuals per residence in Tooele County. Based on these figures, UOS calculated a total of 198.4 individuals subject to Level I arsenic concentrations. Since these individuals are subject to Level I contamination, the appropriate factor value is determined by summing the individuals subject to Level I contamination and multiplying by 10 (Ref. 1, Section 5.1.3.2.1, p. 51647) yielding a total factor value of 1,984.

Level I Concentrations Factor Value: 1,984

5.1.3.2.2 Level II Concentrations

Area Letter	Sample ID	Number of Residences	County Multiplier	Total No. of Residents
A	See Level II Contaminated Samples Table, pp. 21-22 of this HRS package	17	3.2	54.4
B	See Level II Contaminated Samples Table, p. 22 of this HRS package	1	3.2	3.2

There are an additional 18 residences exhibiting an observed release for lead but cannot be considered for Level I contamination as there is no benchmark available for lead for the Soil Exposure route (Ref. 2). U.S. Department of Commerce, Bureau of Census data (Ref. 17, p. 30) indicates that there are an average of 3.2 individuals per residence in Tooele County.

Sum of individuals subject to Level II concentrations: 58

Level II Concentrations Factor Value: 58

5.1.3.3 Workers

Workers were not included in this scoring package.

Total workers: NS

Workers Factor Value: 0
(Table 5-4)

5.1.3.4 Resources

Resource Descriptor(s): There is no commercial agriculture, silviculture, or commercial livestock production or grazing within the area of observed contamination.

Resources Factor Value: 0

5.1.3.5 Terrestrial Sensitive Environments

Resource Descriptor(s): There were no terrestrial sensitive environments identified within the area of observed contamination.

Terrestrial Sensitive Environments Factor Value: 0

5.2 NEARBY POPULATION THREAT

Nearby population was not scored.