Hazard Ranking System Documentation Record

Jones Road Ground Water Plume
Harris County, Texas
TXN 000 605 460

REGION VI

Prepared in cooperation with the
U.S. Environmental Protection Agency

February 2003

Hazard Ranking System Documentation Report

Jones Road Ground Water Plume
Harris County, Texas
TX Pending

Prepared in cooperation with the

U.S. Environmental Protection Agency

Region VI

Prepared by

Protecting Texas
by Reducing and Preventing Pollution

Texas Commission on Environmental Quality
Superfund Site Discovery and Assessment Program
Austin, Texas

February 2003

The preparation of this report was financed through
grants from the U.S. Environmental Protection Agency.

Jones Road Ground Water Plume Site
Harris County, Texas
TXN 000 605 460

Site History

The Jones Road Ground Water Plume site (the "site") consists of a tetrachloroethene (aka PCE, tetrachloroethylene, perchloroethylene), trichloroethene (TCE), and cis-1,2-dichloroethene (DCE) contaminated ground water plume originating from unidentified sources. The Jones Road Ground Water Plume site is approximately one-half mile north of the intersection of Jones Road and FM 1960 (Ref. 4, p. 1; Figures 1a and 1b). The site is located in a mixed residential, urban/light industry area outside the city limits of northwest Houston, Harris County, Texas (Ref. 4, p. 1; Ref. 5, p. 3).

In December 2000, PCE, DCE, and chloromethane were detected in a sample collected at a Public Water Supply (PWS) 1012358 - Finch's Gymnastics USA and Childcare well (Ref. 6, p. 4). This PWS is the indicator and nearest well for the unidentified ground water plume. The PWS supplied water to a gymnastics school and childcare facility for approximately 22 years. Eighteen employees, 90-92 children in childcare and 150-200 gymnastics students attend this facility (Ref. 5, p. 4).

Subsequent sampling analysis of the PWS water well confirmed the previous constituents at higher levels (Ref. 6, p. 6; Ref. 7, pp. 1, 5, 7). PCE, DCE, and chloromethane were detected in the public drinking water supply well samples collected January 25 and May 2, 2001 (Ref. 6, p. 6; Ref. 7, p. 5, 7). The PCE levels exceeded the United States Environmental Protection Agency's (EPA) Maximum Contaminant Level (MCL) drinking water standard of five parts per billion (ppb) or micrograms per liter (Fg/L) (Ref. 8, p. 5). As of June 1, 2001, Finch's Gymnastics USA and Childcare has been providing bottled water to their customers (Ref. 7, p. 2).

The source of the PCE, TCE, and DCE contamination is unknown and the area of contamination remains undefined. Previous investigations have suggested several potential source areas near the drinking water wells; however, adequate documentation attributing the hazardous substances to one or more of the potential source areas has not been identified based on available data. Therefore, a ground water plume with no identified source was used for HRS scoring.

Approximately 220 wells have been sampled by the TCEQ in an effort to protect human health at the Jones Road Ground Water Plume site. Of these wells, 23 wells have had detections of PCE at or above the EPA's MCL of 5 Fg/L. Filtration systems have been placed on those 23 wells. Eighteen wells have had detections of PCE at concentrations below the MCL (Ref. 15, p. 1).

Based on samples collected from March to December 2002, the approximate boundaries of the plume are as follows (Ref. 15, pp. 1-2):

- the northern boundary - the southern end of Echo Spring,
- the southern boundary - Tower Oaks,
- the western boundary - Timber Hollow, and
- the eastern boundary - the eastern side of Jones Road.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS

TABLES

FIGURES

NOTES TO THE READER

The following rules were used when citing references in the Documentation Record:

1. All references attached to this report have been stamped with a designated page number (example: Ref. 1, p. 10 = 001 00010). However, if the reference being cited has an original page number, that page number was cited. If the reference being cited has no original page number or the pagination is not complete, then the designated page number is cited.

2. The State predecessor agencies: Texas Natural Resource Conservation Commission (TNRCC), Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), and Texas Air Control Board (TACB), referred to throughout this report are now known as the Texas Commission on Environmental Quality (TCEQ). The new agency, TCEQ, became effective September 1, 2002, as mandated under House Bill 2912, Article 18 of the 77th Regular Legislative Session.

HRS DOCUMENTATION REPORT
REVIEW COVER SHEET

SITE NAME: JONES ROAD GROUND WATER PLUME

CONTACT PERSON:

Documentation: Brenda Cook, USEPA 214/665-8372
Region 6 NPL Coordinator

Pathway, Components, or Threats Not Evaluated

Surface Water Pathway

The Surface Water Pathway was not scored because the inclusion of this pathway would not significantly affect the site score.

Soil Exposure Pathway

The Soil Exposure Pathway was not scored because the inclusion of this pathway would not significantly affect the site score.

Air Migration Pathway

The Air Migration Pathway was not scored because the inclusion of this pathway would not significantly affect the site score.

HRS DOCUMENTATION RECORD

Name of Site: Jones Road Ground Water Plume **Date Prepared:** 02/03

CERCLIS Site ID Number: TXN 000 605 460

Site Specific Identifier: Unidentified Ground Water Plume

Street Address of Site:
The approximate boundaries of the plume are as follows:

- the northern boundary - the southern end of Echo Spring
- the southern boundary - Tower Oaks
- the western boundary - Timber Hollow, and
- the eastern boundary - the eastern side of Jones Road

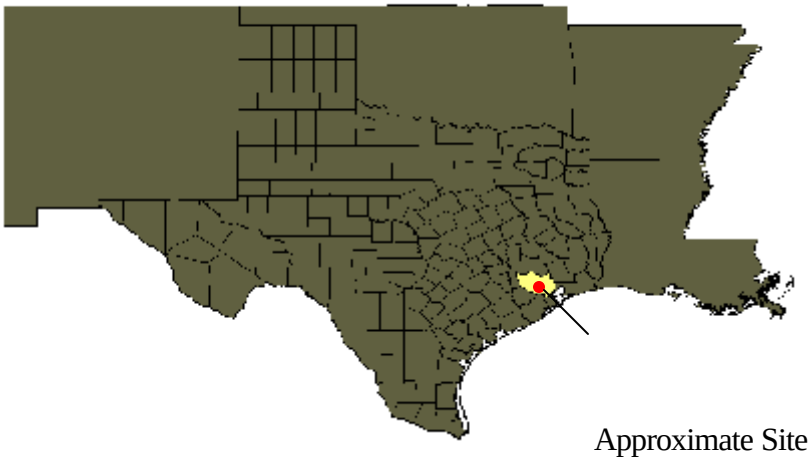
City, County, State: Harris County, Texas

General Location in the State:
The Jones Road Ground Water Plume site is approximately one-half mile north of the intersection of Jones Road and FM 1960 (See Figure 1a for Regional Location Map, Figure 1b for Site Location Map, and Figure 1c for Sample Location Map, Ref. 15, pp. 1-2).

Topographic Map: U.S. Geological Survey 7.5 Minute Topographic Map, Satsuma Quadrangle. Photorevised 1995 (Ref. 4, p.1).

Latitude: 29E 56' 26.34" North **Longitude:** 95E 35' 03.55" West
The geographic coordinates represent the center of the ground water plume.

EPA Region 6



Approximate Site Location

A copy of Figure 1a, Regional Location Map, is available at the EPA Headquarters Superfund Docket:

U.S. EPA CERCLA Docket Office
1301 Constitution Avenue
EPA West, Room B102
Washington, DC 20004

Telephone: (202) 566-0276
E-Mail: superfund.docket@epa.gov

A copy of Figure 1b, Site Location and Surrounding Land Use Map, is available at the EPA Headquarters Superfund Docket:

U.S. EPA CERCLA Docket Office
1301 Constitution Avenue
EPA West, Room B102
Washington, DC 20004

Telephone: (202) 566-0276
E-Mail: superfund.docket@epa.gov

A copy of Figure 1c, Ground Water Sample Location Map, is available at the EPA Headquarters Superfund Docket:

U.S. EPA CERCLA Docket Office
1301 Constitution Avenue
EPA West, Room B102
Washington, DC 20004

Telephone: (202) 566-0276
E-Mail: superfund.docket@epa.gov

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	93	8,649
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)	NS	
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$	8,649	
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root.	46.5	

NS = Not Scored

TABLE 3-1
GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors			Maximum Value	Value Assigned	
Likelihood of Release to an Aquifer					
1.	Observed Release		550	550	
2.	Potential to Release				
	2a.	Containment	10		
	2b.	Net Precipitation	10		
	2c.	Depth to Aquifer	5		
	2d.	Travel Time	35		
	2e.	Potential to Release			
		(Lines 2a(2b + 2c + 2d))	500		
3.	Likelihood of Release				
	(Higher of Line 1 and 2e)		550		550
Waste Characteristics					
4.	Toxicity/Mobility		*	100	
5.	Hazardous Waste Quantity		*	100	
6.	Waste Characteristics		100		10
Targets					
7.	Nearest Well		50	50	
8.	Population:				
	8a.	Level I Concentrations	**	1340	
	8b.	Level II Concentrations	**	0	
	8c.	Potential Contamination	**	NS	
	8d.	Population (Lines 8a + 8b + 8c)	**	1340	
9.	Resources		5	0	
10.	Wellhead Protection Area		20	5	
11.	Targets (Lines 7 + 8d + 9 + 10)		**		1395
Ground Water Migration Score for an Aquifer					
12.	Aquifer Score				
	((Lines 3 x 6 x 11)/82,500)		100		93
Ground Water Migration Pathway Score					
	Pathway Score (S_{gw}), (Highest value from Line 12 for all 13. aquifers evaluated)		100		93

REFERENCE LISTING

Reference Number	Description of the Reference
1.	U.S. Environmental Protection Agency. Federal Register - 40 CFR Part 300; Hazard Ranking System; Final Rule, Volume 55, No. 241, December 14, 1990. 1 page.
2.	U.S. Environmental Protection Agency. Hazard Ranking System Guidance Manual, EPA 540-R-92-026, OSWER Publication 9345.1-07, November 1992. 1 page.
3.	U. S. Environmental Protection Agency, Superfund Chemical Data Matrix (SCDM), EPA/540/R-96/028, OERR Publication 9345.1-21, June 1996. 1 page.
4.	U.S. Geological Survey. Satsuma, Texas Quadrangle, 7.5 Minute Series. Topographic Map. 1995. 1 sheet.
5.	TCEQ. Finch Gymnastics & Jones Road Ground Water Plume. Field Log Notes. 71 pages.
6.	TNRCC. Tetrachloroethene Maximum Contaminant Level Exceedance. Finch Gymnastics - PWS ID #1012358, Harris County, Texas. February 6, 2001. 6 pages.
7.	TNRCC. Prevention of a Violation of the Tetrachloroethene Standard: Finch's Gymnastics USA & Childcare - I.D. # 1012358, Harris County, Texas. July 30, 2001. 7 pages.
8.	U.S. Environmental Protection Agency. National Primary Drinking Water Standards, EPA 816-F-02-013, Office of Water, July 2002. 7 pages.
9.	Texas Water Commission. Notice of Registration: Solid Waste Management: Bell Cleaners. January 4, 1988. 2 pages.
10.	Harol, Michael T. Geo-Tech Environmental, Inc. VCP ID No. 1389. February 7, 2002. 10 pages.
11.	Harol, Michael T. Geo-Tech Environmental, Inc. Voluntary Cleanup Program Site Investigation Report: Bell Dry Cleaners, 11600 Jones Road, Houston, TX 77070. August, 2001. 149 pages.
12.	TNRCC. Superfund Referral: The Estate of Dae Kim dba Bell Dry Cleaners and Henry T.T. Lucky, Inc. September 12, 2002. 23 pages.

REFERENCE LISTING continued

13. TCEQ. Investigation Report: Estate of Dae Kim dba Bell Dry Cleaners. September 18, 2002. 12 pages.

14. TNRCC. Order Affirming with Modifications the Executive Director's Emergency Order Docket No. 2002-0584-IHW-E. August 21, 2002. 25 pages.

15. Cordell, Melissa, TCEQ. Interoffice Memorandum: Jones Road Ground Water Plume site, Harris County, Texas. January 30, 2003. 2 pages.

16. Lower Colorado River Authority (LCRA) Environmental Laboratory Services. Final Analysis Results. March 20, 2002. 235 pages.

17. LCRA Environmental Laboratory Services. Final Analysis Results. March 25, 2002. 319 pages.

18. LCRA Environmental Laboratory Services. Final Analysis Results. March 26, 2002. 426 pages.

19. Shaw Environmental & Infrastructure, Inc. Certificate of Completion: Data Validation of Analytical Data Package Numbers 0203178, 0203208, and 0203229. Ground Water Sampling, Jones Road Superfund Site, Houston, Texas. January 14, 2003. 9 pages.

20. Shaw Environmental & Infrastructure, Inc. Data Usability Summary Report. March - April 2002 Groundwater Sampling, Jones Road Superfund Site, Houston, Texas. January 30, 2003. 25 pages.

21. TNRCC. Investigation Report: Estate of Dae Kim dba Bell Dry Cleaners. May 24, 2002. 89 pages.

22. State of Texas Water Well Reports. February 9, 1978 - December 8, 1994. 14 pages.

23. Focused Site Inspection Report Photographs: March 14-15, 18-20, 2002. 28 pages.

24. U.S. Environmental Protection Agency. Evaluating Ground Water Plumes Under the Hazard Ranking System, EPA 540-F-95-034, OSWER Publication 9320.8-01FS, September 1998. 5 pages.

25. ESA Data Hazard Map: Bell Dry Cleaners. March 15, 2002. 32 pages.

REFERENCE LISTING continued

26. Yahoo! Yellow Pages. Search: Dry Cleaning. February 6, 2002 and April 17, 2002. 15 pages.

27. United States Department of Agriculture: Soil Conservation Service. Soil Survey of Harris County, Texas. August 1976. 11 pages.

28. Coastal Testing Laboratories, Inc. Soil Investigation: Proposed Single Story Building Northwest Harris County, Texas. Received June 1983. 6 pages.

29. United States Geological Survey in cooperation with Texas Department of Water Resources, E.T. Baker, Jr. Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas, Report 236, July 1979. 34 pages.

30. Bureau of Economic Geology, University of Texas at Austin. Geologic Atlas of Texas. Houston Sheet, Scale: 1:250,000. 1982. 2 pages.

31. Texas State Board of Water Engineers. Geology and Ground-Water Resources of the Houston District, Texas. Bulletin 5001. October 1950. 5 pages.

32. TCEQ. Telephone Memo to the File: General Manager of Pameco - Mr. James Kendrick. February 24, 2003. 1 page.

33. TNRCC. Telephone Memo to the File: Ms. Dorothy Leach. March 28, 2002. 1 page.

34. Terry, David. TCEQ. Re: WHPA. Email to Melissa Cordell, TCEQ. August 27, 2002. 2 pages.

35. Cross, Brad L., David P. Terry, and Valerie R. Billings. City of Houston (A Public Water Supply Protection Strategy). July 1991. 24 pages.

SOURCE DESCRIPTION

2.2 Source Characterization

2.2.1 Source Identification

Number of the source: 1

Name and description of the source: Other - Ground Water Plume with No Identified Source

The information used to identify the waste characteristics at the Jones Road Ground Water Plume site was obtained from a field inspection and a review of TCEQ central office records. The site is designated as a contaminated ground water plume originating from unknown sources where hazardous substances may have been released and seeped through the ground to the aquifer.

Based on the results of the drinking ground water samples collected from December 2000 to May 2001 of PWS 1012358 well and the samples collected from March 13 to 20, 2002 and April 1, 2002, the site is reported to contain elevated (i.e., 3x highest background level) volatile organic compounds including PCE, TCE, and DCE (Ref. 16, pp. 4, 6, 11, 13, 23, 232, 233; Ref. 17, pp. 2, 19, 27, 318, 319; Ref. 18, pp. 15, 19, 27, 29, 41, 424, 425; Ref. 19, pp. 1-9; Ref. 20, pp. 2-25).

The source of the PCE, TCE, and DCE contamination is unknown and the area of contamination remains undefined. Previous investigations have suggested several potential source areas near the drinking water wells; however, adequate documentation attributing the hazardous substances to one or more of the potential source areas has not been identified based on available data. Therefore, a ground water plume with no identified source was used for HRS scoring. The ground water plume with no identified source was characterized as the site source based on the following:

- The extent of the plume, although undefined, was estimated solely by sampling, using the criteria for an observed release to the Ground Water Migration Pathway (Ref. 1, Section 2.2).

- The level of effort to identify the original source(s) of the hazardous substances should be equivalent to an Expanded Site Inspection (ESI) (Ref. 24, p. 2). Response action taken by the TCEQ and subsequent monitoring of the wells impacted and surrounding are equivalent to an ESI (Ref. 15, pp.1-2).

Location of the source, with reference to a map of the site:
See Figure 2, Source Area Map.

Source type for HRS evaluation purposes: Other - Ground Water Plume with No Identified Source.

Containment

Gas release to air: The air migration pathway was not evaluated; therefore, gas containment was not evaluated.

Particulate release to air: The air migration pathway was not evaluated; therefore, particulate containment was not evaluated.

Release to ground water: The Containment Factor Value for the ground water migration pathway was evaluated for "All Sources" for evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures). The applicable containment factor value was determined based on existing analytical evidence of hazardous substance in ground water samples from private and public wells (Ref. 16, pp. 4, 6, 11, 13, 23, 232, 233; Ref. 17; Ref. 18, pp. 15, 19, 27, 29, 41, 424, 425; Ref. 19, pp. 1-9; Ref. 20, pp. 2-25). Therefore, based on no liner and evidence of a release, the highest Ground Water Migration Pathway Containment Factor Value of 10 was assigned to Source No. 1 as specified in Table 3-2 of the HRS Rule (Ref. 1, Section 3.1.2.1).

Release to surface water overland/flood migration component: The surface water pathway was not scored; therefore, surface water overland/flood migration component containment was not evaluated.

A copy of Figure 2, Source Area Map, is available at the EPA Headquarters Superfund Docket:

U.S. EPA CERCLA Docket Office
1301 Constitution Avenue
EPA West, Room B102
Washington, DC 20004

Telephone: (202) 566-0276
E-Mail: superfund.docket@epa.gov

2.2.2 Hazardous Substances Associated With A Source

During the May 13-14, 18-20, 2002 Focused Site Inspection (FSI), a total of fifty-two (52) ground water (GW) samples (including five field blanks and six duplicates) were collected to substantiate the release and migration of contaminants. In addition, three (3) background ground water samples were collected outside the plume area (Ref.5, pp. 9, 11-14, 19, 21, 23, 25, 27-29, 31-34, 37-41, 44,46-47, 49–66, 68-71).

Table 1
Sample Collection for Source 1 - Other
(Ground Water Plume with No Identified Source)

Sample ID	Sample Location/Event	Well Screened Interval (feet)	Date Collected	Location Reference
GW-02	Drinking water well sample collected at 10835 Tower Oaks Boulevard	222-232 (Ref. 22, p.10)	3/14/02	Figure 2; Ref. 5, p. 11; Ref. 23, p. 3; Photo #6
GW-03	Well sample collected at 10903 Tower Oaks Boulevard - before the filtration system	223-238 (Ref. 22, p.11)	3/14/02	Figure 2; Ref. 5, p. 12; Ref. 23, p. 4; Photo #8
GW-05/ GW-06	Drinking water well sample collected at 11528 Jones Road [Public Water Supply (PWS) 1011702]	NA	3/14/02	Figure 2; Ref. 5, p. 9; Ref. 23, p. 2; Photo #3
GW-11	Drinking water well sample collected at 11535 Jones Road	NA	3/15/02	Figure 2; Ref. 5, p. 19; Ref. 23, p. 8; Photo #15,16
GW-14	Drinking water well sample collected at 11600 Jones Road [PWS 10112252]	208-238 (Ref. 22, p.5)	3/18/02	Figure 2; Ref. 5, p. 27; Ref. 23, p. 10; Photo #19
GW-22	Drinking water well sample collected at 11022 Forrest Valley Drive	185-195 (Ref. 22, p.2)	3/18/02	Figure 2; Ref. 5, p. 31; Ref. 23, p. 12; Photos #23, 24
GW-26	Water well sample collected at 11130 Forrest Valley Drive	236-246 (Ref. 22, p.3)	3/19/02	Figure 2; Ref. 5, p. 33; Ref. 23, p. 13; Photo #25
GW-36	Drinking water well sample collected at 11023 Forrest Valley Drive	NA	3/19/02	Figure 2; Ref. 5, p. 66; Ref. 23, p. 22; Photo #13
GW-38	Drinking water well sample collected at 11107 Tall Timbers	212-222 (Ref. 22, p.7)	3/19/02	Figure 2; Ref. 5, p. 68; Ref. 23, p. 23; Photo #15
GW-42/ GW-43	Drinking water well sample collected at 10902 Tower Oaks Boulevard	NA	3/19/02	Figure 2; Ref. 5, p. 39; Ref. 23, p. 14; Photo #3,4; Roll 2
GW-49	Drinking water well sample collected at 11427 Jones Road - Closest faucet is after filter	NA	3/20/02	Figure 2; Ref. 5, p. 63; Ref. 23, p. 27; Photo #24

NA = Not Available.

Analytical results of the FSI source samples are summarized in Table 2. The following results identify source constituents that establish an observed release by chemical analysis to the ground water pathway as outlined in Section 2.3 of the HRS Final Rule (Ref. 1).

Table 2
Source Characterization - Other (Ground Water Plume with No Identified Source)

Sample Location	Contaminant Detected	Concentration (µg/L)	PQL (µg/L)	Reference
GW-02	**PCE**	**2.1**	**0.5**	Ref. 16, pp. 4, 232; Ref. 19, pp. 1-3; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	ND	0.5	
GW-03	**PCE**	**15.2**	**0.5**	Ref. 16, pp. 6, 232; Ref. 19, pp. 1-3; Ref. 20, pp. 2-25
	TCE	**0.6**	**0.5**	
	DCE	**1.8**	**0.5**	
GW-05/ GW-06	**PCE**	**1.1**	**0.5**	Ref. 16, pp. 11, 13, 232; Ref. 19, pp. 1-3; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	ND	0.5	
GW-11	**PCE**	**93.2**	**0.5**	Ref. 16, pp. 23, 233; Ref. 19, pp. 1-3; Ref. 20, pp. 2-25
	TCE	**2.1**	**0.5**	
	DCE	**6.2**	**0.5**	
GW-14	**PCE**	**0.7**	**0.5**	Ref. 17, pp. 2, 318; Ref. 19, pp. 4-6; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	ND	0.5	
GW-22	**PCE**	**25.2**	**0.5**	Ref. 17, pp. 19, 319; Ref. 19, pp. 4-6; Ref. 20, pp. 2-25
	TCE	**1.4**	**0.5**	
	DCE	**4.7**	**0.5**	
GW-26	**PCE**	**8.9**	**0.5**	Ref. 17, pp. 27, 319; Ref. 19, pp. 4-6; Ref. 20, pp. 2-25
	TCE	**0.6**	**0.5**	
	DCE	**1.7**	**0.5**	
GW-36	**PCE**	**128**	**0.5**	Ref. 18, pp. 15, 424; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
	TCE	**4.1**	**0.5**	
	DCE	**14.6**	**0.5**	

Notes: Shaded and bold = The sample met observed release criteria for that hazardous substance.
ND = Not detected at the PQL.
PQL = Practical Quantitation Limit.

Table 2 continued
Source Characterization - Other (Ground Water Plume with No Identified Source)

Sample Location	Contaminant Detected	Concentration (µg/L)	PQL (µg/L)	Reference
GW-38	**PCE**	**9.3**	**0.5**	Ref. 18, pp. 19, 424; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
	TCE	**0.6**	**0.5**	
	DCE	**2.2**	**0.5**	
GW-42 GW-43	**PCE**	**5.7**	**0.5**	Ref. 18, pp. 27, 29, 425; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	**0.7**	**0.5**	
GW-49	**PCE**	**7.6**	**0.5**	Ref. 18, pp. 41, 425; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	**1.0**	**0.5**	

Notes: Shaded and bold = The sample met observed release criteria for that hazardous substance.
ND = Not detected at the PQL
PQL = Practical Quantitation Limit.

Three (3) background ground water samples were collected during the March 13-14, 18-20, 2002 FSI up gradient of the ground water plume or outside of the suspected ground water plume area for attribution of naturally occurring source contaminants (Ref. 5, pp. 29, 44, 62; Figure 3). Table 3 provides a summary of the background ground water samples collected and Table 4 indicates the highest designated background levels (non-detect) for the organic hazardous substances of concern for the site.

Table 3
Source Description
Background Sample Locations - Other (Ground Water Plume with No Identified Source)

Sample Location	Sample Location/Event	Well Screened Interval (feet)	Date Collected	Location Reference
GW-20	10610 Tower Oaks Boulevard	Approx. 270-280 (Ref. 22, p. 9)	3/18/02	Figure 3; Ref. 6, p. 29; Ref. 23, pp. 10-11, Photos #20, 21
GW-50 / GW-51	11338 Tower Oaks Boulevard	215-225 (Ref. 22, p. 12)	3/20/02	Figure 3; Ref. 6, p. 44; Ref. 23, p. 15 Photo #5, Roll 2
GW-52	11703 Echo Spring Lane	214-224 (Ref. 22, p. 1)	3/20/02	Figure 3; Ref. 6, p. 62; Ref. 23, p. 26, Photo #22

Table 4
Background Sample Table - Source No. 1 - Other
(Ground Water Plume with No Identified Source)

Organic Constituent	Station ID	Highest Concentration [PQL] Fg/L	3 x Highest Background Concentration Fg/L	Reference
PCE	GW-52	ND [0.5]	**NA**	Ref. 18, pp. 47, 426; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
TCE	GW-52	ND [0.5]	**NA**	Ref. 18, pp. 47, 426; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
DCE	GW-52	ND [0.5]	**NA**	Ref. 18, pp. 47, 426; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25

Notes: ND = Not Detected at the PQL. [PQL] = Practical Quantitation Limit.. NA = Not applicable.

A complete listing of all source characterization sample results is included as References 16, 17, 18, 19, and 20 of this report (Ref. 16, pp. 1-235; Ref. 17, pp. 1-319; Ref. 18, pp. 1-426, Ref. 19, pp. 1-9; Ref. 20 pp. 2-25). All samples were collected according to the EPA approved state Quality Assurance Project Plan and sample locations were approved by the EPA.

A copy of Figure 3, Background Sample Location Map, is available at the EPA Headquarters Superfund Docket:

U.S. EPA CERCLA Docket Office
1301 Constitution Avenue
EPA West, Room B102
Washington, DC 20004

Telephone: (202) 566-0276
E-Mail: superfund.docket@epa.gov

2.2.3 Hazardous Substances Available to a Pathway

Because the containment factor value for Source 1 is greater than 0, the following hazardous substances associated with source can migrate via the ground water pathway:

PCE TCE DCE

2.3 LIKELIHOOD OF RELEASE

Refer to Reference 1, Section 3.1 of this documentation record for specific information related to Likelihood of Release to the Ground Water Pathway.

2.4 WASTE CHARACTERISTICS

2.4.1 Selection of Substance Potentially Posing Greatest Threat

The Mobility Factor Value for all hazardous substances that meet the criteria for an observed release by chemical analysis to one or more aquifers underlying the source(s) at the site, regardless of the aquifer being evaluated, is assigned a mobility factor value of 1 (Ref. 1, Section 3.2.1.2).

Contaminant characteristic values for hazardous substances found in an observed release to the ground water were derived from SCDM (Ref. 3). The hazardous substances with the highest toxicity/mobility factor value available to the ground water migration pathway are PCE and DCE (100). Therefore, the hazardous substances PCE and DCE are the hazardous substances associated with this source posing the greatest hazard (Ref. 1, Sections 2.4.1.2, 3.2.1).

Specific factors of the hazardous substances available to the Ground Water Migration Pathway and selection of the hazardous substance with the highest combined factor value (toxicity and mobility), are presented under the Ground Water Migration Pathway section of this Documentation Record.

2.4.2. Hazardous Waste Quantity

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1. Hazardous Constituent Quantity (Tier A) - Not Evaluated (NE)

The information available is not sufficient to evaluate Tier A, as required in Section 2.4.2.1.1 of the HRS Rule. As a result, the evaluation of Hazardous Waste Quantity proceeds to the evaluation of Tier B, hazardous waste quantity (Ref. 1, Section 2.4.2.1.1).

2.4.2.1.2. Hazardous Wastestream Quantity (Tier B) - NE

The information available is not sufficient to evaluate Tier B, as required in Section 2.4.2.1.2 of the HRS Rule. As a result the evaluation of Hazardous Waste Quantity proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2).

2.4.2.1.3. Volume (Tier C)

Since the hazardous wastestream was not adequately determined under Tier B, the volume will be evaluated under Tier C. For the migration pathways, the source is assigned a value for volume using the appropriate Tier C equation from Table 2-5 (Ref. 1, Section 2.4.2.1.3). The hazardous waste quantity for a plume site with no identified source can be determined by measuring the area within all observed release samples combined with the vertical extent of contamination, to arrive at an estimate of the plume volume (Ref. 24, p. 4).

Since the extent of the ground water plume is unknown, the volume for the ground water plume will be designated as unknown, but greater than zero.

2.4.2.1.4. Area (Tier D) - NE

The area measure (Tier D) cannot be evaluated because the hazardous waste quantity table (Ref.1 Table 2-5) does not provide a divisor for source type “other” in this tier (Ref. 24, p. 4).

2.4.2.1.5. Source Hazardous Waste Quantity Value

As described in the HRS Rule, the highest value assigned to a source from among the four tiers of hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), volume (Tier C) or area (Tier D) shall be selected as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1).

Table 5
Source Hazardous Waste Quantity
Source 1 - Other - Ground Water Plume with No Identified Source

Tier Measure	Migration Pathway (Ground Water)
Tier A, Constituent Quantity	NE
Tier B, Wastestream Quantity	NE
Tier C, Volume	> 0
Tier D, Area	NE

NE = Not Evaluated

Source No. 1, Other - Ground Water Plume with No Identified Source, Hazardous Waste Quantity Value: > 0

SITE SUMMARY OF SOURCE DESCRIPTIONS

During the week of March 13-14, 18-20, 2002, the Texas Commission on Environmental Quality (TCEQ), Superfund Site Discovery and Assessment Program (SSDAP) conducted sampling activities at the Jones Road Ground Water Plume site (Ref. 5, pp. 2- 70). Forty-three wells were sampled for volatile organic compounds (see Figure 1c, Ground Water Sample Location Map).

The designated laboratory for the Jones Road Ground Water Plume site was the Environmental Laboratory Services of the Lower Colorado River Authority, 3505 Montopolis Drive, Austin, Texas 78744. The water samples were analyzed under EPA Method 524.2 for organic drinking water analysis (Ref.16, p. 1; Ref. 17, p. 2; Ref. 18, p. 2, Ref. 19, pp 1- 12; Ref. 20, pp. 1-25).

The analytical results documented organic concentrations greater than or equal to the background sample(s) quantitation limit or practical quantitation limit (PQL), if not detected in background (see Tables 1-5).

Table 6
Site Summary of Source Descriptions

Source Number	Source Hazardous Waste Quantity Value	Containment				
		Ground Water	Surface Water	Soil Exposure	Gas	Air Particulate
1	> 0	10	NE	NE	NE	NE
TOTAL	**> 0**					

NE = Not Evaluated

According to Section 2.4.2.2. of the HRS Rule, a hazardous waste quantity factor value of 100 was assigned because the hazardous constituent quantity data is not adequately determined for one or more sources, and targets for the Ground Water Migration Pathway are subject to Level I concentrations (Ref. 1, Section 2.4.2.2).

The sum of the source hazardous waste quantity value is assigned as the Hazardous Waste Quantity Factor Value (Ref. 1, Section 2.4.2.2).

Source No. 1, Other - Ground Water Plume with No Identified Source, Hazardous Waste Quantity Factor Value: 100

POTENTIAL SOURCES

The source of the PCE, TCE, and DCE contamination is unknown and the area of contamination remains undefined. Previous investigations have suggested several potential source areas near the drinking water wells; however, adequate documentation attributing the hazardous substances to one or more of the potential source areas has not been identified based on available data. Therefore, a ground water plume with no identified source was used for HRS scoring.

The following businesses were located near PWS 1012358 either by TCEQ file review or by field observation (Figure 4).

Bell Dry Cleaners (Bell) (EPA TXD982287302, TCEQ Solid Waste Registration Number 90216) is a business located in a suite at 11600 Jones Road and is approximately 0.2 miles north of the Finch's Gymnastics USA and Childcare facility. The facility has operated for over 14 years (Ref. 9, p. 1, Ref. 21, p. 1). Three (3) hazardous waste streams are listed on the current Notice of Registration (NOR) for Bell. Waste stream (WS) 0506609H is described as PCE sludge hazardous for D007 (chromium) and F002 (spent PCE). This stream is generated from the routine cleaning of the PCE filters. WS 0906310H is the actual PCE filters which is hazardous for D039 (tetrachloroethylene) and F002. The third WS, 991002, is also listed as hazardous for D039 and appears to be an older listing for WS 0506609H (Ref. 21, pp. 2, 13-15; Ref. 13, pp. 9-12). TCEQ Houston Region staff collected a sample of the liquid waste generated from Bell's dry cleaning machine water separator on April 18, 2002 to determine the concentration of spent dry cleaning solvent in the waste stream. The sample revealed PCE at 94.9 part per million (ppm) or mg/L. Other waste streams generated at Bell consist of non-hazardous trash and soapy water (Ref. 21, pp. 2-3, 23, 36). The 1992 Annual Waste Summary (AWS) for the facility identifies 1.2 tons of WS 991002 as being generated at Bell. A review of the available hazardous waste shipping and disposal records for Bell found the facility generates on average approximately 95 pounds (43 kilograms) per month of PCE sludge (WS 0506609H). This waste is collected and disposed of by Safety Kleen Corp. in Missouri City, Texas (TNRCC ID No. 71144) (Ref. 13, pp. 9-12). In addition, the facility also generates a minimum of three gallons (11.3 kilograms) of contaminated liquid per day of operation from the dry cleaning machine water separator. Based on a six day work week and a four week month, approximately 271 kilograms of this waste stream is generated each month (Ref. 21, p. 3).

During a Phase I Environmental Site Assessment in June 2001, leakage was identified from the dry cleaning machine running into the storm drains behind Bell. In July 2001 three soil borings were advanced then converted into temporary groundwater monitoring wells (Ref. 11, p. 4). Ground water samples taken from the west side and the front side of Bell were determined to be impacted (Ref.11, pp. 6, 31). DCE was detected at 0.326 parts per million or mg/kg and PCE was detected at 0.767 mg/kg in a soil sample collected at the property. Ground water

samples contained vinyl chloride at 0.122 mg/L, 0.028 mg/L, and 0.007 mg/L; TCE at 0.242 mg/L, 0.010 mg/L, and 0.025 mg/L; and PCE at 0.833 mg/L, 0.028 mg/L, and 0.339 mg/L (Ref. 11, pp. 8, 37-46).

Additional actions taken by the consultant for Bell, Geo-Tech Environmental, Inc. included three borings on the property and installation of six permanent monitoring wells. Vinyl chloride, DCE, TCE, and PCE were detected in ground water samples in three other monitoring wells on the Bell facility. One of those monitoring wells, directly south of the Bell suite, also contained trans-1,2-dichloroethene and PCE (Ref. 10, pp. 1, 4, 5). From May to August 2002, TCEQ pursued an enforcement case against the Estate of Dae Kim (owner of Bell) and Henry T. T. Lucky, Inc. (Lucky, property owner of 11600 Jones Road). On May 1, 2002, TCEQ initiated an emergency order against the Estate of Dae Kim and Lucky. The Emergency Order instructed that Bell and Lucky (1) maintain filtrations systems currently installed, (2) develop and implement sampling plan, (3) sample all wells within a half mile of the facility, (4) add filtration systems to any new wells with contamination at or above the EPA's MCL of 5 Fg/L for PCE, (5) complete investigation on nature, extent, etc. of the contamination, (6) submit ground water investigation report, and (7) conduct any necessary further investigation (Ref. 12, pp. 6-9). During May 2002, the representatives of Bell volunteered to stop the use of PCE at 11600 Jones Road (Ref. 13, p. 1). On June 21 and July 25, 2002, inspections confirmed that PCE from dry cleaning machine had been removed and there was no PCE at Bell (Ref. 13, pp.1, 2). On August 21, 2002, an Order was issued affirming modifications to the May 1, 2002 Emergency Order. This ordered Bell and Lucky to: (1) continue cessation of all use of PCE at that location, (2) grant access for remediation, and (3) add a restriction to prohibit the use of PCE at 11600 Jones Road (Ref. 12, p. 3; Ref. 14, p. 3).

- Advanced Auto Repair is located at 11600 Jones Road. An on-site inspection of this business and Bell was conducted to complete a Phase I Environmental Site Assessment by Bell's consultant, Geo-Tech Environmental, Inc. Typical work activities include major engine overhauls, brake repair, transmission repair, and other general maintenance activities. The shop area was observed to be relatively clean during the walk through but evidence of surficial staining was noted particularly near the waste oil storage drums. Most of the oil stains were observed on the surface of the concrete, however, some concrete seams appeared to be impacted. According to the shop manager/owner all waste oils and used solvents are removed from the site (Ref. 11, pp. 5-6).

- The following businesses were located to the east of PWS 1012358 - Finch's Gymnastics USA and Childcare (Ref. 5, p. 3): Pameco, Harrison Hydraulic Generators, Omni Data Systems, Cal-Tex Computers, Inc., GM Concrete, Inc., Blow Out Preventor Controls, Woodworks, Xerox, American Storage, Champion Fastener & Industrial Supply, Inc., and Turner Paving & Construction, Inc. (Ref. 5, pp. 3, 50-51).

A copy of Figure 4, Nearby Industries Map, is available at the EPA Headquarters Superfund Docket:

U.S. EPA CERCLA Docket Office
1301 Constitution Avenue
EPA West, Room B102
Washington, DC 20004

Telephone: (202) 566-0276
E-Mail: superfund.docket@epa.gov

- The following businesses were located to the west of PWS 1012358: Napa Auto Parts, Phillips 66, Brock's Collision and Repair, and two pest control companies (Ref. 5, p. 3).

- Geographic information collected by the TCEQ Source Water Assessment Program, identifies the location of some dry cleaners, auto repair salvage, used oil, plastic businesses, paint shops, and petroleum chemical industries in the vicinity of the site (Figure 4).

- An ESA Data Hazard Map created for Bell revealed 14 Resource Conservation and Recovery Act (RCRA) regulated sites. They include: Bell Dry Cleaners at 11600 Jones Road, Brocks Collision Repair on 11116 Tower Oaks, Thompson Hayward Chemical Company at 11311 Jones Road West, Pilgrim Cleaners on 12307 Jones Road, Beck Masten Pontiac GMS on FM 1960, Minit-Lube on 11831 Jones Road, formerly PI Components Corp. on 10825 Bareley Lane, Mobile Oil Corporation on FM 1960, Atlas Transmission on 11642 Jones Road, Sierra Cleaners on 10823 Jones Road, and Pacific Painters on FM 1960 (Ref. 25, pp. 6, 7, 24-25).

- A Yahoo!® Nearby Business Search revealed the following dry cleaners from the search of 10903 Tower Oaks Boulevard, Houston, TX 77070, address of PWS 1012358 (approximate distance from well is in parenthesis): Bell Cleaners at 11600 Jones Road (0.2 miles), Dry Clean Work at 11663 Jones Road (0.3 miles), A-1 Cleaners at 10928 FM 1960 Road (0.4 miles), J & K Cleaners on 10931 FM 1960 (0.4 miles), J & K Cleaners & Laundry 10600 Jones Road (0.4 miles), Town Cleaners at 11902 Jones Road (0.5 miles), Sierra Cleaners at 10805 Jones Road (0.5 miles), Lee Cleaners II at 12795 Windfern (0.6 miles), Pilgrim Cleaners at 11114 ½ Cypress North Houston Road (0.9 miles), J & K Cleaners & Laundry at 12380 Jones Road (1 mile), Snow Brite Cleaners on 11614 Cypress North Houston Road (1.1 miles), Lee Dry Cleaners at 12511 Jones Road (1.1 miles), and Pilgrim Cleaners at 9591 Jones Road (1.9 miles) (Ref. 26, pp. 1-14).

- During the field event, a drum of dry cleaning solvent was documented behind the buildings at 10825 Barely Lane (Ref. 5, p. 37; Ref. 23, p. 14, Photo 2, Roll 2).

SOURCES NOT SCORED

- Ground water samples were collected from existing wells available in the area of the suspected plume. No soil, surface water, sediment, or air samples were collected at this site.

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 GENERAL CONSIDERATIONS

Stratum 1: Soil Groups

Aris-Gessner Complex

The Aris-Gessner complex is a soil group that is located south of Tower Oaks Boulevard and consists of the area where Finch's Gymnastics USA and Childcare well is located (Ref. 27, pp. 10-11). The complex consists of 30 to 50 percent Aris soil, 20 to 30 percent Gessner soil, and 20 to 30 percent other soils. The soils in this complex are so intricately mixed that separation was not feasible at the mapping scale for the survey (Ref. 27, p.7).

- The Aris soil has a surface layer of friable, neutral dark grayish brown sandy loam about seven inches thick. The layer below that is friable, slightly acid, grayish brown fine sandy loam that extends to a depth of 21 inches. The next layer, extending to a depth of 28 inches is firm, medium acid, gray sandy clay loam that tongues and interfingers. The layer below that extends to a depth of 46 inches and is very firm, strongly acid, dark gray clay mottled with red and strong brown. The next layer is very firm, medium acid, gray clay that extends to a depth of 60 inches, where it grades to very firm, slightly acid, light gray clay loam (Ref. 27, p. 7).

- The Gessner soil has a surface layer of friable, slightly acid, dark grayish brown loam about seven inches thick. The layer below that is about 9 inches thick and is friable, slightly acid, grayish brown loam. It tongues into the next layer, which is friable, neutral, dark gray loam that is slightly more clayey. That layer extends to a depth of 34 inches. The layer below that is friable, moderately alkaline, light brownish gray loam about 19 inches thick. Below that, extending to a depth of 84 inches, is a layer of firm, moderately alkaline, light gray sandy clay loam that has distinct mottles of yellowish brown and brownish yellow (Ref. 27, p.7).

- The soils are poorly drained and are saturated with water part of the year. Excess water ponds on the Gessner soil and for long periods. Permeability is moderate to very slow. The available water capacity is medium (Ref. 27, p.7).

Gessner-Urban Land Complex

The area of land north of the Tower Oaks Boulevard consist of the Gessner-Urban land complex (Ref. 27, pp. 10-11). Gessner soils make up 20 to 80 percent of this unit; Urban land, 10 to 75 percent; and other soils, 10 to 20 percent. The areas making up this complex are so intricately mixed that separation was not practical at the scale used in mapping (Ref. 27, p. 9).

- Urban land consists of soils that have been altered or are covered by buildings or other urban structures and of other disturbed areas. Besides the urban structures, other areas have been disturbed by cutting, filling, or grading. In some areas six to 24 inches of fill material covers the entire soil profile (Ref. 27, p. 9).

- Gessner soils have severe limitations for streets, low-cost roads and urban development in general, as well as for use as septic tank filter fields. The main limitation is poor drainage. Water stands on the surface for long periods after rains, and the soil remains wet long after water on the surface has evaporated. Most areas are muddy and boggy when wet (Ref. 27, p.9).

Addicks Loam Soil Group

The residential area of the land on Forrest Valley and Jones Road south of Woodedge consist of the Addicks loam soil group (Ref. 27, pp. 10-11). The surface layer is friable, neutral, black loam about 11 inches thick. The layer below that is friable, neutral dark gray loam about 12 inches thick. The next layer is about 26 inches thick and consists of friable, moderately alkaline, light gray loam that is about 20 percent, by volume, visible calcium carbonate. Below that is a layer of firm, moderately alkaline, light gray loam that has distinct yellow and yellowish brown mottles and is about five percent visible calcium carbonated. This soil is poorly drained. It is saturated with water for short periods during the year. Surface runoff is slow, internal drainage is slow; and permeability is moderate. The available water capacity is high (Ref. 27, p.6).

Gessner Loam Soil Group

Land that lies east of Jones Road and the Gessner-Urban soil complex consists of the Gessner loam soil group (Ref. 27, pp. 10-11). This soil is poorly drained and is generally saturated in wet periods. Surface runoff is very slow to ponded, and internal drainage is slow. Permeability is moderate, and the available water capacity is high (Ref. 27, pp. 8-9).

Previous Soil Investigation

In 1983, a soil investigation was conducted for a proposed single story building at the property where PWS 1012358 is located. Three boring holes were made to characterize the soil. From the boring logs, the first two and a half feet were characterized as: (boring one) - light gray sandy silt with traces of clay (very stiff), (boring two) - gray sandy silt with clay (hard), and (boring three) - gray sandy silt (hard). From two and a half to approximately seven feet, boring one was characterized as light gray and tan very silty clay with some sand and traces of iron ore nodules (hard), boring two was gray and tan very silty clay with sand (hard), and boring three was light gray and tan very silty clay with some sand (hard). From approximately seven to 20 feet, the log showed for boring one - light gray and tan clay with light gray sand seams and pockets from seven to 12 feet (stiff) which grades to light gray, red and tan at 12 feet (very stiff), and grades to red and light gray with some calcareous nodules at 17 feet. For the same depth, boring two is characterized by light gray and tan clay with sand seams and pockets from seven to 12 feet (very stiff)

and grades into red and light gray with some calcareous nodules at 12 feet. For the same depth, boring three is characterized by light gray and tan clay with sand seams and pockets from seven to 13 feet (very stiff) and grades to light gray and red with some calcareous nodules at 13 feet (hard) (Ref. 28, pp. 3-5).

3.0.1.2 Aquifer Boundaries

Aquifer/Stratum 2

Aquifer/Stratum Name: Chicot Aquifer

The area of the suspected ground water plume is located in the Gulf Coastal Plain of Southeast Texas. The area is comprised of overlapping formations that tend to increase in thickness toward the coast. The subject site is underlain by a series of Quaternary and Tertiary-aged fluviatile deposits (Ref. 29, p.8). The formations were deposited in deltaic stream channel, point bar, natural levee, backswamp, or mudflat environments and consist mainly of clay, silt, sand and gravel (Ref. 30, p. 2).

Table 7 shows a representation of the framework of part of the Costal Plain of Texas (Ref. 29, p. 8).

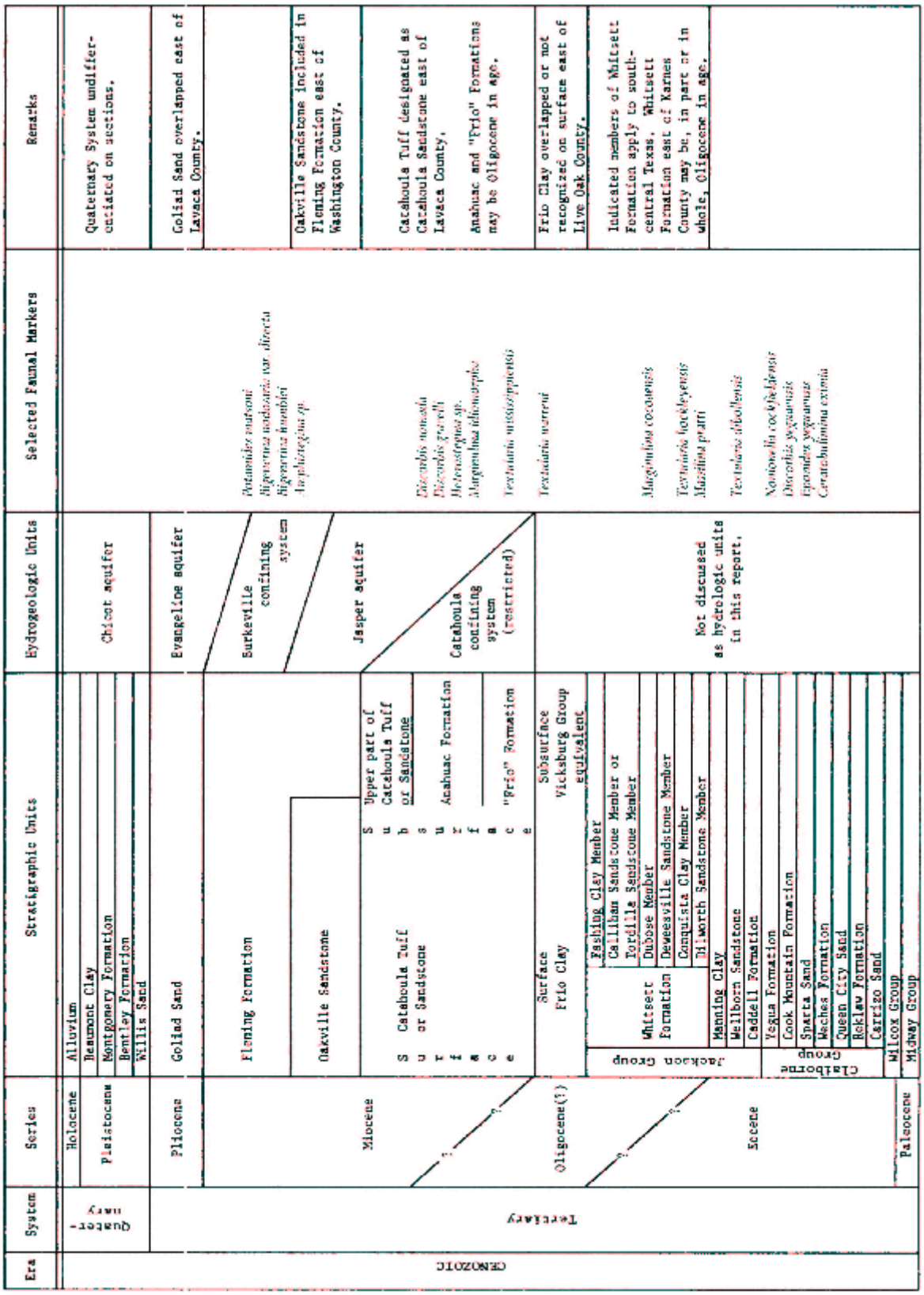
The Lissie Formation of the Chicot Aquifer is found at the surface near the site. The upper part consists of clay, silt, sand and very minor siliceous gravel of granule and small pebble size, gravel more abundant northwestward, locally calcareous, concretions of calcium carbonate, iron oxide, and iron-manganese oxides common in the zone of weathering; fluviatile; surface fairly flat and featureless except for numerous rounded shallow depressions and pimple mounds. The lower part consists of clay, silt, sand, and minor amount of gravel; gravel slightly coarser than in the upper part, noncalcareous, iron oxide concretions more abundant than in the upper part; fluviatile; very gently rolling; thickness approximately 200 feet (Ref. 30, p. 2).

The Willis Formation extends to a maximum depth of 75 feet and is comprised of clay, silt, and sand. However, more coarse-grained sediments are found in this formation than the overlying formations (Ref. 30, p. 2).

The lower unit of the Chicot Aquifer includes the lower portion of the Beaumont (not found in this area) and extends through the Willis Formation (Ref. 29, p. 8). The Chicot Aquifer is recognized for an abundance of water in Southeast Texas due to the high percentage of sand in the aquifer formations (Ref. 29, p. 32). The depth of the Chicot Aquifer could approximately be 300 to 400 feet below ground surface (Ref. 29, p. 11).

TABLE 7

Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas



Aquifer/Stratum 3

Aquifer Being Evaluated: Evangeline Aquifer

The Evangeline Aquifer is considered to be one of the most prolific aquifers of the Coastal Plain, yielding large quantities of good quality ground water. The top of the Evangeline Aquifer could be approximately 300 to 400 feet below ground surface (Ref. 29, p. 8).

The Evangeline aquifer and the underlying Jasper Aquifer are separated by the Burkeville Confining System, which consists of silt and clay strata and ranges from approximately 300 to 400 feet in thickness. The top of this confining unit could be found approximately 1,150 to 2000 feet below ground surface (Ref. 29, p. 31).

3.1 Likelihood of Release

3.1.1 Observed Release

An observed release to the Chicot Aquifer can be documented in the HRS by two methods: a) direct observation and b) chemical analysis. We will document the observed release by chemical analysis in this Documentation Record.

Chemical Analysis

An observed release has been documented to the ground water pathway for the site by chemical analysis (Table 11). Establishing an observed release by chemical analysis requires analytical evidence of a hazardous substance in the media significantly above the background level. If the background concentration is not detected (or is less than the detection limit), an observed release is established when the sample measurement equals or exceeds its own sample quantitation limit and that of the background sample (Ref. 1, Section 2.3, Table 2-3).

Background Concentration

The following table provides a summary of the designated background levels for the organic hazardous substances of concern for this site.

Three (3) background ground water samples were collected during the March 13-14, 18-20, 2002 FSI up gradient of the ground water plume or outside of the suspected ground water plume area for attribution of naturally occurring source contaminants (Ref. 5, pp. 29, 44, 62; Figure 3). Table 8 provides a summary of the background ground water samples collected and Table 9 indicates the highest background levels for the organic hazardous substances of concern for the site.

Table 8
Background Ground Water Samples Collected

Sample Location	Sample Location/Event	Well Screened Interval (feet)	Date Collected	Location Reference
GW-20	10610 Tower Oaks Boulevard	Approx. 270-280 (Ref. 22, p. 9)	3/18/02	Figure 3; Ref. 5, p. 29; Ref. 23, pp. 10-11, Photos #20, 21
GW-50 / GW-51	11338 Tower Oaks Boulevard	215-225 (Ref. 22, p. 12)	3/20/02	Figure 3; Ref. 5, p. 44; Ref. 23, p. 15 Photo #5, Roll 2
GW-52	11703 Echo Spring Lane	214-224 (Ref. 22, p. 1)	3/20/02	Figure 3; Ref. 5, p. 62; Ref. 23, p. 26, Photos #22

Table 9
Summary of Highest Constituents Detected in the Background Drinking Water Wells

Organic Constituent	Station ID	Highest Concentration [PQL] µg/L	3 x Highest Background Concentration µg/L	Reference
PCE	GW-52	ND [0.5]	**NA**	Ref. 18, pp. 47, 426; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
TCE	GW-52	ND [0.5]	**NA**	Ref. 18, pp. 47, 426; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
DCE	GW-52	ND [0.5]	**NA**	Ref. 18, pp. 47, 426; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25

A complete listing of all source characterization sample results is included as References 16, 17, 18, 19 and 20 of this report (Ref. 16, pp. 1-235; Ref. 17, pp. 1-319; Ref. 18, pp. 1-426; Ref. 19, pp. 1-9; Ref. 20, pp. 2-25). All samples were collected according to the EPA approved state Quality Assurance Project Plan and sample locations were approved by the EPA.

Contaminated Samples

The following samples meet the observed release criteria and are presented below indicating organic hazardous substances with their concentrations and SQLs/PQLs. These samples were qualified as "releases" based on the criteria in Table 2-3 (Ref. 1, Section 2.3).

Table 10
Ground Water Migration Pathway
Drinking Water Samples Description

Sample ID	Sample Location/Event	Well Screened Interval (feet)	Date Collected	Location Reference
GW-02	Drinking water well sample collected at 10835 Tower Oaks Boulevard	222-232 (Ref. 22, p.10)	3/14/02	Figure 5; Ref. 5, p. 11; Ref. 23, p. 3; Photo #6
GW-03	Well sample collected at 10903 Tower Oaks Boulevard - before the filtration system	223-238 (Ref. 22, p.11)	3/14/02	Figure 5; Ref. 5, p. 12; Ref. 23, p. 4; Photo #8
GW-11	Drinking water well sample collected at 11535 Jones Road	NA	3/15/02	Figure 5; Ref. 5, p. 19; Ref. 23, p. 8; Photo #15, 16
GW-22	Drinking water well sample collected at 11022 Forrest Valley Drive	185-195 (Ref. 22, p.2)	3/18/02	Figure 5; Ref. 5, p. 31; Ref. 23, p. 12; Photos #23, 24
GW-36	Drinking water well sample collected at 11023 Forrest Valley Drive	NA	3/19/02	Figure 5; Ref. 5, p. 66; Ref. 23, p. 22; Photo #13
GW-38	Drinking water well sample collected at 11107 Tall Timbers	212-222 (Ref. 22, p.7)	3/19/02	Figure 5; Ref. 5, p. 68; Ref. 23, p. 23; Photo #15
GW-42/ GW-43	Drinking water well sample collected at 10902 Tower Oaks Boulevard	NA	3/19/02	Figure 5; Ref. 5, p. 39; Ref. 23, p. 15; Photo #4; Roll 2
GW-49	Drinking water well sample collected at 1427 Jones Road Closest faucet after filter	NA	3/20/02	Figure 5; Ref. 5, p. 63; Ref. 23, p. 27; Photo #24

NA = Not Available.

A copy of Figure 5, Drinking Water Wells with Observed Releases, is available at the EPA Headquarters Superfund Docket:

U.S. EPA CERCLA Docket Office
1301 Constitution Avenue
EPA West, Room B102
Washington, DC 20004

Telephone: (202) 566-0276
E-Mail: superfund.docket@epa.gov

Table 11
Ground Water Pathway
Drinking Water Samples That Meet the Observed Release Criteria

Sample Location	Contaminant Detected	Concentration (µg/L)	PQL (µg/L)	Reference
GW-02	**PCE**	**2.1**	**0.5**	Ref. 16, pp. 4, 232; Ref. 19, pp. 1-3; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	ND	0.5	
GW-03	**PCE**	**15.2**	**0.5**	Ref. 16, pp. 6, 232; Ref. 19. pp. 1-3; Ref. 20, pp. 2-25
	TCE	**0.6**	**0.5**	
	DCE	**1.8**	**0.5**	
GW-11	**PCE**	**93.2**	**0.5**	Ref. 16, pp. 23, 233; Ref. 19, pp. 1-3; Ref. 20, pp. 2-25
	TCE	**2.1**	**0.5**	
	DCE	**6.2**	**0.5**	
GW-22	**PCE**	**25.2**	**0.5**	Ref. 17, pp. 19, 319; Ref. 19, pp. 4-6; Ref. 20, pp. 2-25
	TCE	**1.4**	**0.5**	
	DCE	**4.7**	**0.5**	
GW-36	**PCE**	**128**	**0.5**	Ref. 18, pp. 15, 424; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
	TCE	**4.1**	**0.5**	
	DCE	**14.6**	**0.5**	
GW-38	**PCE**	**9.3**	**0.5**	Ref. 18, pp. 19, 424; Ref. 19, pp. 7-9; Ref.20, pp. 2-25
	TCE	**0.6**	**0.5**	
	DCE	**2.2**	**0.5**	
GW-42 / GW-43	**PCE**	**5.7**	**0.5**	Ref. 18, pp. 27, 29, 425; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	**0.7**	**0.5**	
GW-49	**PCE**	**7.6**	**0.5**	Ref. 18, pp. 41, 425; Ref. 19, pp. 7-9; Ref. 20, pp. 2-25
	TCE	ND	0.5	
	DCE	**1.0**	**0.5**	

Notes: Shaded and bold = The sample met observed release criteria for that hazardous substance.
ND = Not detected at the PQL.
PQL = Practical Quantitation Limit

A complete listing of all ground water sample results is included as References 16, 17, 18, 19, and 20 of this report (Ref. 16, pp. 1-235; Ref. 17, pp. 1-319; Ref. 18, pp. 1-426; Ref. 19, pp. 1-9; Ref. 20, pp. 2-25).

All samples were collected according to the EPA approved state Quality Assurance Project Plan and sample locations were approved by the EPA.

Attribution:

The site is designated as a contaminated ground water plume originating from unknown sources where hazardous substances may have been released and seeped through the ground to the aquifer. When the source itself consists of a ground water plume with no identified source, no separate attribution is required (Ref.1, Sec. 3.1.1)

Hazardous Substances Released:

- PCE
- TCE
- DCE

As specified in the HRS Rule (Ref. 1, Section 3.1.1), an observed release factor value of 550 was assigned to the Chicot Aquifer since an observed release by chemical analysis was established to the aquifer.

Observed Release Factor Value: 550

3.1.2 Potential to Release

As specified in the HRS Rule, since an observed release was established for the Chicot Aquifer, the potential to release was not evaluated (Ref. 1, Section 3.1.1).

3.1.3 Likelihood of Release Factor Category Value

As stated in the HRS Rule, if an observed release is established for an aquifer, assign the observed release factor value of 550 as the likelihood of release factor category value for the aquifer (Ref. 1, Section 3.1.3). Since an observed release has been established for the Chicot Aquifer, the Observed Release Factor Value of 550 is assigned as the likelihood of release factor category value.

3.2 Waste Characteristics

3.2.1 Toxicity/Mobility

The following toxicity, mobility and combined toxicity/mobility factor values have been assigned to those substances associated with Source No. 1, or present in the observed release, which have a containment value greater than 0.

Table 12
Toxicity/Mobility Factor Values

Hazardous Substance	Toxicity Factor Value	* Mobility Factor Value	Toxicity / Mobility Value	Reference
PCE	100	1	100	Ref. 1, Sections 2.4.1.2, 3.2.1; Ref. 3
TCE	10	1	10	Ref. 1, Sections 2.4.1.2, 3.2.1; Ref. 3
DCE	100	1	100	Ref. 1, Sections 2.4.1.2, 3.2.1; Ref. 3

Documentation for Toxicity/Mobility Values:

*The Mobility Factor Value for all hazardous substances that meet the criteria for an observed release by chemical analysis to one or more aquifers underlying the source(s) at the site, regardless of the aquifer being evaluated, is assigned a mobility factor value of 1 (Ref. 1, Section 3.2.1.2).

Contaminant characteristic values for hazardous substances found in an observed release to the Chicot Aquifer were derived from SCDM (Ref. 3). The hazardous substances with the highest toxicity/mobility factor value available to the ground water migration pathway are PCE and DCE (100).

Toxicity/Mobility Factor Value: 100

3.2.2 Hazardous Waste Quantity

Table 13
Source Hazardous Waste Quantity Values

SOURCE NUMBER	SOURCE HAZARDOUS WASTE QUANTITY VALUE	HAZARDOUS CONSTITUENT QUANTITY DATA COMPLETE?
1	>0.0	NO
Total	>0.0*	

According to Section 2.4.2.2. of the HRS Rule, a hazardous waste quantity factor value of 100 was assigned because the hazardous constituent quantity data is not adequately determined for one or more sources, and targets for the Ground Water Migration Pathway are subject to Level I concentrations (Ref. 1, Section 2.4.2.2).

3.2.3 Waste Characteristics Factor Category Value

As specified in the HRS Rule (Ref. 1, Section 3.2.3), the Hazardous Waste Quantity Factor Value of 100 was multiplied by the highest Toxicity/Mobility Value of 100, resulting in a product of 10,000 (1.0E+04). Based on this product, a Waste Characteristics Factor Value of 10 was assigned from Table 2-7 of the HRS Rule (Ref. 1, Section 2.4.3.1).

Hazardous Waste Quantity Factor Value: 1.0E+04

Waste Characteristics Factor Category Value: 10

3.3 Ground Water Pathway Targets

There are additional wells in the area surrounding those sampled during the March 14-15, 18-20, 2002 sampling event (Ref. 15, pp. 1-2). The screened interval for the drinking water wells sampled range from 185 to 246 feet deep (Ref. 22, pp. 1-14). The regional direction of groundwater flow is documented to be in a south, southeasterly direction (Ref. 31, p. 2) while the local, shallow groundwater gradient appears to be to the south, southwest (Ref. 10, p. 10).

3.3.1 Nearest Well

According to Section 3.3.1 of the HRS Rule, if one or more drinking water wells is subject to Level I concentrations, a Nearest Well Factor value of 50 is assigned. Level I concentrations have been documented at eight wells within the groundwater plume (see section 3.3.2.2 of this HRS documentation record).

Level of Contamination (I, II, or potential): Level I

Location of Well: Level I concentrations have been documented at eight wells within the groundwater plume. Well locations are identified in Table 14, section 3.3.2.2 of this HRS documentation record.

For a well with Level I concentrations, a Nearest Well Factor Value of 50 is assigned (Ref. 1, Section 3.3.1).

Nearest Well Factor Value: 50

3.3.2 Population

3.3.2.1 Level of Contamination

3.3.2.2 Level I Concentrations

Table 14
Drinking Water Wells with Level I Concentrations

Well Identification	PCE Concentrations (ug/L)	Benchmarks/Screening Concentrations			Population Served	
		MCL/ MCLG (ug/L)	Cancer Risk Screen. Con. (ug/L)	Ref. Dose Screen. Conc. (ug/L)	People	Reference
10835 Tower Oaks (GW-02)	2.1	5.0	1.6	360	2	Ref. 5, p. 11; Ref. 32, p. 1
10903 Tower Oaks (GW-03)	15.2				108*	Ref. 5, p. 4
11535 Jones Road (GW-11)	93.2				5	Ref. 5, p. 19
11022 Forrest Valley (GW-22)	25.2				2	Ref. 5, p. 31
11023 Forrest Valley (GW-36)	128				3	Ref. 5, p. 66
11107 Tall Timbers (GW-38)	9.3				1	Ref. 5, p. 68, Ref. 33, p. 1
10902 Tower Oaks - (GW-42) School of Dance - Star Marketing - owned by Mr. Glenn Taylor	5.7				4	Ref. 5, pp. 7, 15, 39
11427 Jones Road (GW-49)	7.6				9	Ref. 5, pp. 45, 63

* At Finch's Gymnastics USA and Childcare, there are 18 employees, 90-92 children in the day care, and 150-200 gymnastics students (Ref. 5, p. 4). A population of 108 includes 18 employees and 90 children in daycare.

The concentrations of hazardous substance shown above include concentrations of hazardous substances detected in drinking water wells that meet or exceed their corresponding benchmark concentrations (Ref. 3, SCDM). An observed release to the Ground Water Migration Pathway has been established based on the detection of these compounds found in the above drinking water wells; thus, these wells are associated with Level I concentrations (Ref. 1, Section 3.3.2.1, 3.3.2.2).

As specified in the HRS Rule, (Ref. 1, Section 3.3.2.2), the number of people served by drinking water from points of withdrawal subject to Level I concentrations were summed. The population subject to Level I concentrations is based on the number of individuals regularly served by the eight drinking water wells.

The total population served by the eight wells is 134 (Ref. 5, pp. 4, 7, 11, 15, 19, 31, 39, 45, 63, 66, 68; Ref. 32, p. 1; Ref. 33, p. 1). The total of 134 was multiplied by 10, for a product of 1,340 (Ref. 1, Section 3.3.2.2).

Population Served by Level I Well: 134

Level I Concentration Factor Value: 1,340

3.3.2.3 Level II Concentrations

Based on the samples collected for the March 13-14, 18-20, 2002 FSI, no drinking water wells subject to Level II concentrations have been identified.

Level II Concentration Factor Value: 0

3.3.2.4 Potential Contamination

The potential contamination factor was not scored because it would not significantly affect the site score. Although not evaluated in this document, the TCEQ and the USEPA are concerned about populations that are potentially exposed to contamination.

Potential Contamination Factor Value: NS

3.3.3 Resources

No resource, as defined in HRS Section 3.3.3, were documented for the aquifer (Ref. 1).

Resources Factor Value: NS

3.3.4 Wellhead Protection Area

According to Section 3.3.4 of the HRS Rule, a value of "5" is to be assigned if, within the TDL, there is a designated Wellhead Protection Area applicable to the aquifer being evaluated, or overlying aquifer. The City of Houston Public Water Supply wells G1010013SH and G1010013SI participate in the Wellhead Protection Area (WHPA), which is within the 4-mile TDL (Ref. 2, p. 194; Ref. 34, pp. 1-2; Ref. 35, pp. 5-7, 10). Therefore, a Wellhead Protection Area Factor Value is assigned a value of five (Ref. 1, Section 3.3.4).

Wellhead Protection Area Factor Value: 5

3.3.5 Calculation of Targets Factor Category Value

The target factor category value is calculated by determining the sum of the factor values for the nearest well (50.0), population (1470.0), resources (0.0), and Wellhead Protection Area (5.0) (Ref. 1, Section 3.3.5).

Calculations: 50.0 + 1340 + 0.0 + 5.0 = 1395.0

3.4 Ground Water Migration Score for an Aquifer

The ground water migration score for an aquifer is calculated by multiplying the factor category values for likelihood of release (550.0), waste characteristics (10.0), and targets (1525.0). Divide by 82,500, the resulting value (maximum value 100) is assigned as the ground water migration pathway score (Ref.1, Section 3.4).

Calculations: (550.0 x 10.0 x 1395.0) ÷ 82,500 = 93.0 (100 maximum)

3.5 Calculation of Ground Water Migration Pathway Score

The Ground Water Migration Pathway Score is calculated by assigning the highest ground water migration score for the Chicot Aquifer (93.0).

Ground Water Migration Pathway Score: 93.0

4.0 Surface Water Migration Pathway

4.0.1 General Considerations

The Surface Water Migration Pathway was not scored because the inclusion of this pathway would not significantly affect the site score.

5.0 Soil Exposure Pathway

5.0.1 General Considerations

The Soil Exposure Pathway was not scored because the inclusion of this pathway would not significantly affect the site score.

6.0 Air Migration Pathway

6.0.1 General Considerations

The air migration pathway was not evaluated because the inclusion of this pathway would not significantly affect the site score.