SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

FINAL
REMEDIAL INVESTIGATION REPORT
Hexagon Laboratories
Site No. 2-03-003

VOLUME II

Work Assignment Number
D003060-13.3A

Prepared by

TAMS Consultants, Inc.

The TAMS Building
655 Third Avenue
New York, NY 10017-5617

August 1999

HEXAGON LABORATORIES REMEDIAL INVESTIGATION

CONTENTS

VOLUME I PAGE

HEXAGON LABORATORIES REMEDIAL INVESTIGATION

CONTENTS

VOLUME I

HEXAGON LABORATORIES REMEDIAL INVESTIGATION

CONTENTS

VOLUME I PAGE

HEXAGON LABORATORIES REMEDIAL INVESTIGATION

CONTENTS

HEXAGON LABORATORIES REMEDIAL INVESTIGATION

CONTENTS

VOLUME I

LIST OF TABLES

CONTENTS

VOLUME I

LIST OF TABLES (CONTINUED)

LIST OF FIGURES

HEXAGON LABORATORIES REMEDIAL INVESTIGATION

CONTENTS

VOLUME I

LIST OF FIGURES (CONTINUED)

VOLUME II

APPENDICES

APPENDICES

APPENDIX A

GEOPHYSICAL SURVEY RESULTS

HAGER-RICHTER
GEOSCIENCE, INC.

GEOPHYSICAL SURVEY
HEXAGON LABORATORIES SITE
BRONX, NEW YORK

Prepared for:

TAMS Consultants, Inc.
300 Broadacres Drive
Bloomfield, New Jersey 07003

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way - D10
Salem, New Hampshire 03079

File 97J114
December, 1997

HAGER-RICHTER GEOSCIENCE, INC.

CONSULTANTS IN GEOLOGY & GEOPHYSICS
8 INDUSTRIAL WAY - D10
SALEM, NEW HAMPSHIRE 03079
TELEPHONE (603) 893-9944
FAX (603) 893-8313

December 4, 1997
File 97J114

Mr. Bruce Fidler
TAMS Consultants, Inc.
300 Broadacres Drive
Bloomfield, New Jersey 07003

RE: Geophysical Survey
Hexagon Laboratories Site
Bronx, New York

Dear Mr. Fidler:

In this letter, we briefly report the results of a geophysical survey conducted by Hager-Richter Geoscience, Inc. at the Hexagon Laboratories Site in Bronx, New York for TAMS Consultants, Inc. (TAMS) on November 25, 1997. The scope of the project and area of interest were specified by TAMS. The geophysical survey is part of an environmental investigation of the site by TAMS for the New York State Department of Environmental Conservation (NYSDEC).

Introduction

The subject site is a former chemical plant located in an industrial section of the Bronx. Figure 1 shows the general location of the Site. According to information provided by TAMS, several USTs were discovered during demolition activities at the Site. At the time of the geophysical survey, all buildings on site had been demolished, and several concrete debris piles were present. Portions of the floor slabs for the buildings were in place.

Objective

The objective of the geophysical survey was to detect possible additional USTs in the accessible portions of the Site.

The Survey

Roger Yang and Christopher Kujawa of Hager-Richter conducted the field operations on November 25, 1997. The project was coordinated with Mr. Paul Kareth of TAMS. Mr. Christopher Purkiss, also of TAMS, was present and assisted with the field effort. Mr. Purkiss specified the area of interest for the survey as the accessible portions of the Site.

Geophysical Survey
Hexagon Laboratories Site
Bronx, New York
File 97J114 November, 1997

Two complementary geophysical methods were used: ground penetrating radar (GPR) and precision utility location (PUL). The GPR survey was conducted using a Geophysical Survey Systems SIR-2 digital GPR system with a 500 MHz antenna and an 60 nsec time window. The PUL survey was conducted using a Radiodetection RD400 electromagnetic utility locator and a Chicago Steel Tape FT-70 magnetic pipe and cable locator.

Results

Figure 2 is a sketch plan of the Site showing the locations of GPR traverses and our interpretation of the data. The GPR traverses were spaced no greater than 5 feet apart and oriented in two mutually perpendicular directions in the area of interest. This traverse spacing is sufficient to detect USTs with capacities of 500 gallons or greater with a high degree of confidence.

GPR signal penetration was limited at the Hexagon Laboratories Site due to site soil conditions. Based on handbook time-to-depth conversions for the GPR signal in average soils, the GPR signal penetration is estimated to be no more than approximately 3 to 4 feet.

GPR reflections similar to that of USTs were detected in the GPR records for two locations, and we infer that two possible USTs are present, however, the interpretation is tentative. The locations of the possible USTs are shown on Figure 2. Three areas exhibited magnetic anomalies based on the PUL survey and, we infer that buried metal is present at these locations. No GPR reflections consistent with USTs were not detected in the areas of magnetic anomalies. If present, USTs are at depths greater than the GPR signal penetration. Figure 2 shows the locations possible buried metal.

Conclusions

Based on the geophysical survey conducted at Hexagon Laboratories Site in Bronx, New York, we conclude:

- Two possible USTs were detected at the Site.
- No other USTs with (a) electrical properties sufficiently contrasting with the surrounding soils to produce GPR reflections, (b) a capacity of 500 gallons or greater, or (c) magnetic properties sufficient to produce a detectable magnetic anomaly was detected in the accessible portions of the area of interest at the Site and in the effective depth of penetration of the GPR signal (no more than approximately 3 to 4 feet).

Limitations

This letter report was prepared for the exclusive use of TAMS Consultants, Inc. and

NYSDEC (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

The detection of subsurface utilities and/or other subsurface objects was not an objective of this survey, and the survey was not designed to detect such. However, some utilities and/or other subsurface objects were detected, and their locations are provided as a courtesy. Other utilities and/or other buried objects may be present, and the Client or any third party shall not rely on this report for information on such.

H-R has used reasonable care, skill, competence and judgment in the performance of its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

If you have any questions or comments on this letter report, please contact us at your convenience. It has been a pleasure to work with TAMS on this project. We look forward to working with you again in the future.

Sincerely yours,
HAGER-RICHTER GEOSCIENCE, INC.

Dorothy Richter
Dorothy Richter
President

Attachments: Figures 1 & 2

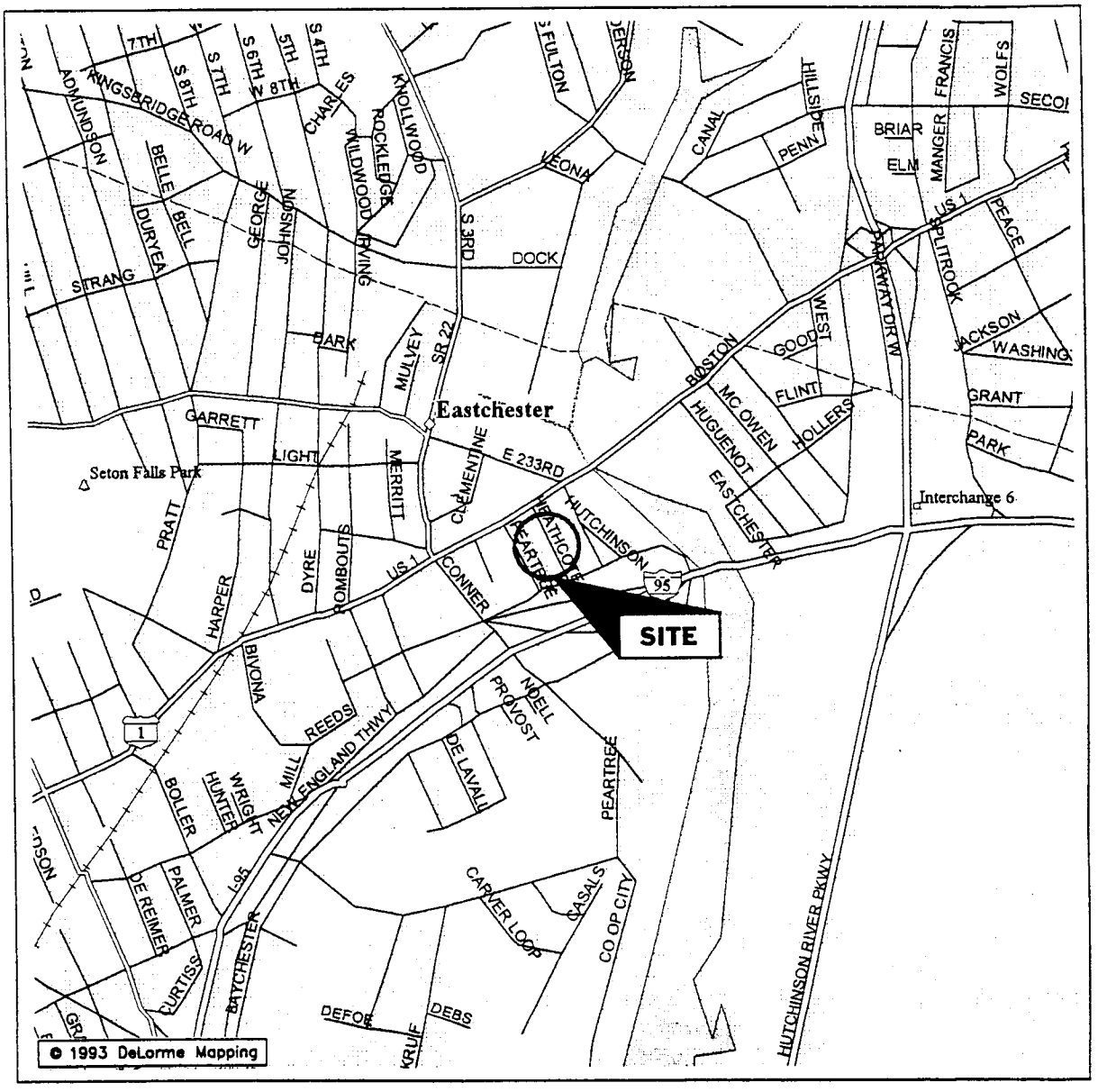


Figure 1
General Site Location
Hexagon Laboratories Site
Bronx, New York

File 97J114 | December, 1997

HAGER–RICHTER GEOSCIENCE, INC.
Salem, New Hampshire

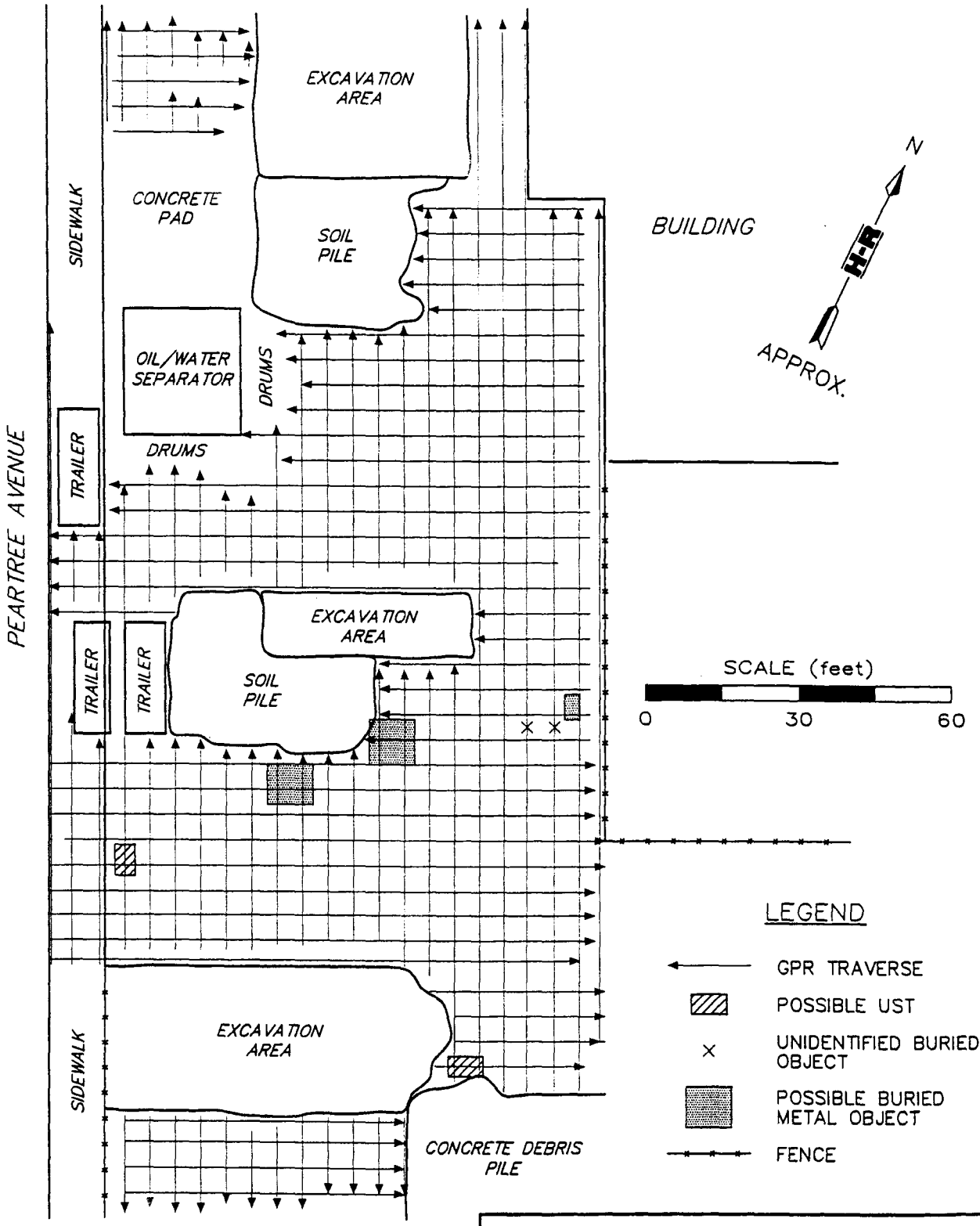


Figure 2
GPR Survey
Hexagon Laboratories Site
Bronx, New York

File 97J114 | December, 1997

HAGER–RICHTER GEOSCIENCE, INC.
Salem, New Hampshire

NOTE:

Sketch plan developed from plans provided by TAMS Consultants, Inc. and field notes.

APPENDIX B

FIELD LOGS

Soil Boring Logs
Monitoring Well Installation Logs
Monitoring Well Development Logs
Groundwater Sampling Logs

SOIL BORING LOGS

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-1(MW-1)**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/19/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	Steel	split spoon	--	--
				I.D.	3¾-inch	1 3/8-inch		
				WT./Fall	--	140 lbs.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1 9:30	17 - 28 5 - 5	0.4	0.6	Blacktop SM - Dark brown silty coarse to fine SAND, glass, cinders.
-- 2					
-- 3	S-2 9:40	5 - 5 8 - 6	0.4	0.1	SM - Black silty SAND, some gravel, cinders, dry.
-- 4					
-- 5	S-3 9:50	7 - 7 9 - 9	0.4	1.5	SM - Black silty coarse to fine SAND, some gravel, tip is wet. Faint odor. **HXB1S3 (TCL/TAL, TOC, TCLP)**
-- 6					
-- 7	S-4 10:00	14 - 18 22 - 42	--	NR	Slough, water in spoon.
-- 8					
-- 9	S-5	41 - 50/2	0.4	1.0	Same As Above Spoon refusal at 9ft, auger out to 9 ft
--10	S-6 10:15	14 - 14 20 - 28	0.4	0.7	SM - Dark gray coarse to fine SAND, wet.
--11					
--12	S-7 10:20	21 - 21 28 - 30	0.4	1.5	SM - Black silty coarse to fine SAND, mica noted, very weathered schist. **HXB1S7 (TCL/TAL, TOC, TCLP)**
--13					
--14	S-8 10:30	19 - 21 36 - 30	0.4	1.0	SM - Same As Above
--15					SM - Same As Above, mostly slough, spoon is blown out with sand. Top of weathered rock at 16 ft.
--16	S-9 10:40	100/6	0.4	2.0	Auger to 16.5 ft, material is getting harder.
--17					End of Boring At 16.5 ft.
--18					Install monitoring well MW-1
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-2(MW-2)**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 3
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/19/97
SURFACE ELEVATION:	DATUM: DRILLER:	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	Steel	split spoon		
				I.D.	6-inch	1 3/8 inch		
				WT./Fall	--	140 lbs.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1					Blacktop
-- 2					For soil descriptions 0 ft to 16.5 ft, see boring log B-1
-- 3					Augered to 17 ft with 6 1/4-inch HSAs End of day 11/19/97
-- 4					Start of day 11/20/97 Ream borehole with 8 1/4-inch HSAs to 17 ft
-- 5					
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					16 ft
--17					Top of weathered bedrock, SCHIST HSAs to 17 ft Drill out 17 ft to 21 ft using 7 7/8-inch tricone bit
--18					
--19					
--20					

TAMS CONSULTANTS, INC | BORING LOG | Boring No.: B-2 (MW-2)

PROJECT: Hexagon Laboratories

PROJECT NO.: 585-300 | PAGE 2 OF 3

Depth (ft)	Sample # & Time	Blows per/6"	Recovery (feet)	HNu (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
--20					Install 6-inch ID steel casing to 21 ft. Grout casing in place.
					End of day 11/20/97
--21					
					Start of day 11/21/97
--22	R-1				Continue drilling inside the 6-inch casing using a NQ core barrel.
					Start of Day 12/8/97 - Ream borehole from 21 ft to 53 ft using an
--23					air rotary 6-inch percussion bit.
					MANHATTAN SCHIST
--24					7 Pieces: 7, 7, 6, 2, 2, 2½, 21
					Recovery: 47½ inches, 79%
--25					RQD: 41 inches, 68%
					Drilling time: 23 minutes
--26					
--27	R-2				MANHATTAN SCHIST, chlorite noted on some cracks,
					fine sand noted in some cracks.
--28					10 Pieces: 6½, 7½, 2, 10, 5, 11, 8, 2½, 3, 3
					Recovery: 58½ inches, 98%
--29					RQD: 48 inches, 80%
					Drilling time: 30 minutes
--30					
--31					
--32	R-3				MANHATTAN SCHIST
					9 Pieces: 10, 6, 2½, 2½, 3, 3, 19, 9, 9 (last piece broke during
--33					removal, broke into 4 pieces)
					Recovery: 64 inches, 107%
--34					RQD: 53 inches, 88%
					Drilling time: 20 minutes
--35					
--36					
--37	R-4				MANHATTAN SCHIST, biotite content increased significantly
					near the bottom of the core run, 38 - 41 ft very fast drilling,
--38					no recovery for bottom 3 ft of core run.
					3 Pieces: 15, 8, 3
--39					Recovery: 26 inches, 43%
					RQD: 23 inches, 38%
--40					Drilling time: 16 minutes

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-2 (MW-2)**

PROJECT: Hexagon Laboratories

PROJECT NO.: 585-300 PAGE 3 OF 3

Depth (ft)	Sample # & Time	Blows per/6"	Recovery (feet)	HNu (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-40	R-4 (Cont.)				
-41					
-42	R-5				MANHATTAN SCHIST - Very soft from 41 - 43 ft, uneven drilling for the rest of the core run. Driller noted a significant amount of formation water from 40 - 45 ft during air hammer reaming, several clay coated fractures noted, condition of core is poor.
-43					
-44					6 Pieces: rubble, 4, 5, 5, 5, 4, 4
-45					Recovery: 27 inches, 45%
-46					RQD: 27 inches, 45% Drilling time: 26 minutes
-47	R-6				MANHATTAN SCHIST - Several rubble zones recovered, drilling advance slowed below 49 ft, driller noted less formation water below 49 ft during air hammer reaming.
-48					
-49					6 Pieces: rubble, 3, 3, 5, rubble, 2½, 3, 3, rubble
-50					Recovery: 19½ inches, 33%
-51					RQD: 5 inches, 8% Drilling time: 25 minutes End of Day 11/21/97
-52					
-53					End of Boring at 53.0 Ft
-54					
-55					Install monitoring well MW-2 on 12/8/97
-56					
-57					
-58					
-59					
-60					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-3(MW-3)**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/11/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	Steel	split spoon	HQ	
				I.D.	4-inch	1 3/8-inch	--	
				WT./Fall	--	140 lbs/30-inch		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1		NR	1.0	10-inch thick concrete slab 6-inch thick layer of very wet fill material 8-inch thick concrete slab
-- 2					
-- 3	S-2 13:00	17-18 20-29	0.9	1.0	SM -Dark greenish gray to black silty coarse to fine SAND, some gravel, mica noted, weathered schist. **HXB3S2 (TCL/TAL, TCLP)**
-- 4					Soft rock, auger down to 5 ft
-- 5	S-3				
-- 6	13:30	50/6	0.3	1.0	Dark greenish gray schist, quart pockets
-- 7					Attempted core run at 6 ft through HSAs, lost circulation End of Day 11/11/97 Start of Day 11/12/97
-- 8					Set 4-inch spin casing to 7 ft.
-- 9					Attempted another core run at 7 ft, HQ core barrel kept jamming in the spin casing, pulling it loose, kept loosing circulation.
--10					End of Day 11/12/97 Start of Day 11/13/97
--11	R-1				*Augered to 8 ft with 6 1/4-inch HSAs, 5 7/8-inch tricone bit to 10 ft*
--12					MANHATTAN SCHIST 3 Pieces: 2½, core split up the side - 2 more pieces
--13					Recovery: 2½ inches, 28 % RQD: 0 inches, 0 %
--14					Core barrel is jamming in the hole, could not complete the run, core run terminated after 1 ft.
--15					Drilled out to 23 ft using a 5 7/8-inch tricone roller bit Set a temporary 2-inch piezometer to establish depth to water
--16					
--17					After the temporary piezometer was removed, the borehole was backfilled to 15 ft with #1 sand. A 1 ft thick bentonite pellet seal was placed on top of the sandpack prior to well installation.
--18					
--19					
--20					
--21					
--22					Install monitoring well MW-3
--23					End of Boring at 23 Ft

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-4-1**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/18/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	HSA	split spoon		
				I.D.	4 1/4 -inch	1 3/8 inch		
				WT./Fall	--	140 lbs./30 inch		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
					6-inch thick concrete slab
-- 1	S-1 8:45	10-14 15-30	1.1	peak 50-60	
-- 2					Split spoon is bouncing at 2 ft
					Use augers to drill past concrete
-- 3					Concrete slab 2.0 to greater than 4.5 ft., possible footing
-- 4					Abandon borehole
-- 5					End of Boring at 4.5 Ft
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-4 (MW-4)**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/18/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	HSA	split spoon	HQ	--
				I.D.	6¼-inch	1 3/8-inch	2½-inch	
				WT./Fall	--	140 lbs / 30-inch	--	

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1				Auger to 2 ft. (See boring log B-4-1) No sample.
-- 2					
-- 3	S-2 9:40	15-14 28-28	10	peak 15	SM - Black silty coarse to fine SAND, some fine gravel, moist. **HXB4S2 (TCL, TAL, TOC)** **DUP HXB54**
-- 4					
-- 5	S-3 9:55	15-14 18-20	1.1	peak -5	MANHATTAN SCHIST - Greenish black, foliated, mica, very weathered, easily broken up, solvent smell.
-- 6					
-- 7					Drill out to 8 ft with 5 7/8-inch tricone bit Drill out to 8 ft with 6 1/4-inch HSAs
-- 8					
-- 9	R-1				MANHATTAN SCHIST - Dark green, some rust on fracture surfaces. 4 Pieces: 5, 6½, 2, 4½
--10					Recovery: 18 inches, 75% RQD: 16 inches, 67%
--11					Drilling time: 9 minutes
--12					Loosing seal in mud tub, stop core run after 2 ft
--13					End of Borehole at 10 ft
--14					
--15					Monitoring well MW-4 installed in an adjacent borehole on 12/8/97
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-5 (MW-5)**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/14/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	6 1/4 -inch	split spoon	HQ	--
				I.D.	--	1 3/8 inch	2½-inch	
				WT./Fall		140 lbs./30 in.	--	

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1 12:00	10-11 10-9	1.0	rain fogging	SM - Yellowish brown silty coarse to fine SAND, trace gravel, mica noted,very weathered schist.
-- 2					
-- 3	S-2 12:05	28-29 50/4	0.9	fogging	SM - Gray silty coarse to fine SAND, trace gravel, mica noted, schist in tip, strong odor. **HXB5S2 (TCL/TAL, TOC, TCLP, GS)**
-- 4					Top of weathered bedrock at 3.5 ft
-- 5					Drill out using a 5 3/4-inch tricone to 5 ft.
-- 6	R-1				MANHATTAN SCHIST
-- 7					12 Pieces: 2, 5½, rubble, 2½, 2, 5, 2, 3, 3, 2, 9, 3, 10
-- 8					Recovery: 49 inches, 82%
-- 9					RQD: 29½ inches, 49 %
--10					Running time: 32 minutes (8,5,5,5,9)
--11					
--12					
--13					Drill to 13 ft. with 5 7/8-inch tricone bit, borehole keeps filling with sand, End of Day 11/14/97.
--14					
--15					Start of Day 11/17/97
--16					Auger to 6 ft with 6 1/4-inch HSAs, advance borehole from 13 ft to 16 ft using 5 7/8-inch tricone bit. Borehole collasped to 15 ft.
--17					End of Boring at 16 Ft
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-6 (MW-6)**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 1/16/98
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: C. Purkiss

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE		split spoon	PQ	
				I.D.		2 1/2-inch	2 1/2-inch	
				WT./Fall		140 lbs.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
					6-inch thick concrete sidewalk, 6-inch thick stone base
-- 1	S-1	18 - 56	0.9	0.2	SP/SM - Brown gravelly coarse to fine SAND, some silt, trace clay, dry. **HXB6S1 (TCL/TAL,TOC, GS)**
-- 2					
-- 3	Run 1				MANHATTAN SCHIST
-- 4					
-- 5					11 Pieces: 2, 3, 4, 4, 8, 1, 3, 4½, 4, 5½, 4 Recovery: 43 inches, 72% RQD: 34 inches, 57%
-- 6					
-- 7					First water noted at 6.5 to 7 ft
-- 8					Ream borehole with 6-inch percussion air rotary bit to 7 ft, continue borehole advance to 15.5 ft with percussion bit.
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					End of Boring at 15.5 Ft.
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-12**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/12/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	HSA	split spoon		
				I.D.	4 1/4 -inch	1 3/8 -inch		
				WT./Fall	--	140 lbs./30 in.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
	S-1			peak	6 inches of dirt.
-- 1				of	Concrete slab from 0.5-2 ft. auger to 2 ft.
				2	No sample collected.
-- 2					
	S-2	7-6		peak	SM - Dark brown silty coarse to fine SAND, dry.
-- 3			0.7	of	**HXB12S2 (TCL, TAL, TPH, TCLP)**
	12:10	8-28		20	Strong odor, smells like paint thinner
-- 4					
	S-3	14-20		peak	SM - Brown silty coarse to fine SAND, wet.
-- 5			0.3	of	Rock in tip, weathered schist.
	12:20	28-50		20+	
-- 6					
-- 7					End of Boring at 6.0 ft.
					HNu readings in the breathing zone @ background levels,
-- 8					HNu readings of cuttings peaking at 100.
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC | **BORING LOG** | **Boring No.: B-7**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/11/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE		split spoon	--	--
				I.D.		1 3/8 inch		
				WT./Fall		140 lbs./30 in.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1 8:30	50/6	0.2	0.2	Blacktop SM - Dark gray silty coarse to fine SAND, some fine gravel dry. Spoon refusal at 0.5 ft, auger down to 2 ft.
-- 2					
-- 3	S-2 8:45	4-9 13-16	0.9	2.0	SM - Dark greenish gray coarse to fine SAND, some silty gravel moist. **HXB7S2 (TCL/TAL, GS)**
-- 4					
-- 5	S-3 9:10	14-13 22-55	0.4	0.2	SM - Dark greenish gray coarse to fine SAND, some silt, fine gravel, quartz, mica noted, weathered schist, poor recovery. Very hard augering at 6 ft.
-- 6					
-- 7	S-4 9:20	15-15 14-29	1.1	0.6	SM - Dark gray to black some silt, fine gravel, mica noted, weathered schist. **HXB7S4 (TCL, TAL, GS)**
-- 8					Auger obstruction at 6-7 ft.
-- 9	S-5 9:30	17-28 38-56	0.9	0.4	SM - Black silty coarse to fine SAND, some gravel weathered schist, mica noted, spoon tip shows foliation.
--10					End of Boring at 10 ft.
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-8**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/17/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	4 1/4 -inch HSA	split spoon	--	--
				I.D.	--	1 3/8 -inch		
				WT./Fall		140 lbs./30 in.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
	S-1				6 inch thick concrete slab (surface)
-- 1		--	--	--	6 inch thick soil layer
	13:10				6 inch thick concrete slab
-- 2					
	S-2				Attempted a split spoon, hit more concrete, no recovery
-- 3		--	--	--	12 inch thick concrete slab at 3 ft
-- 4					SM - Gray and black silty fine to coarse SAND, some coarse to fine gravel, silt, mica noted, dry, no odor.
	S-3	4-6			
-- 5			0.8	--	**HXB8S3 (GS)**
	13:30	18-24			
-- 6					SM - Same as above, top of weathered rock at 7.0 ft.
	S-4	38-50			**HXB8S3 (TCL, TAL)**
-- 7			0.7	--	
	13:40				End of Boring at 7.0 ft
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-9**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/11/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	HSA	split spoon	--	--
				I.D.	4 1/4 -inch	1 3/8 -inch		
				WT./Fall	--	140 lbs./30 in.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
					Break through concrete slab with augers.
-- 1	S-1 10:45	7-10 11-16	0.7	0.6	SM/SP - Brown coarse to fine SAND, trace silt, trace gravel dry.
-- 2					
-- 3	S-2 10:50	7-7 8-7	1.0	0.6	SM - Brown silty coarse to fine SAND, mica noted, weathered schist, dry.
-- 4					
-- 5	S-3 11:00	7-8 12-12	0.6	peak of 6	SM - Dark brown silty coarse to fine SAND, mica noted, dry. **HXB9S3 (TCL, TAL)**
-- 6					
-- 7	S-4 11:10	21-50	0.5	peak of 1	SM - Brown silty coarse to fine SAND, dry. Spoon refusal at 7 ft, auger out to 8 ft.
-- 8					
-- 9	S-5 11:25	29-39 15-11	1.1	peak of 15	SM - Greenish black silty coarse to fine SAND, trace gravel, weathered schist, moist. **HXB9S5 (TCL, TAL)**
--10					
--11	S-6 11:35	28-50	0.3	0.6	SM - Black silty coarse to fine SAND, some gravel, saturated.
--12					End of Boring at 11.0 Ft
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-10**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/12/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	HSA	split spoon		
				I.D.	4 1/4 -inch	1 3/8 -inch		
				WT./Fall	--	140 lbs./30 in.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1 10:20	7-8 9-8	0.6	peak of 150	SM - Black silty coarse to fine SAND, some gravel, moist. **HXB10S1 (TCL, TAL,TOC, TCLP)** VOC sample collected from 0-2 ft; SVOC, Pest/PCB ,TAL collected from a composite of 0-2 ft & 2-4 ft spoons, TOC & TCLP sample collected from auger flights.
-- 2					
-- 3	S-2 10:25	12-12 21-28	0.5	peak of 120	SM - Same as above.
-- 4					
-- 5	S-3 10:35	20-50/6	0.3	1.0	Very weathered schist. top of rock ---------- 5.0 ft ---------- Auger to 6 ft
-- 6					
-- 7	S-4 10:45	50/4	0.2	1.0	Weathered schist. No sample collected. Auger to 8 ft
-- 8					
-- 9	S-5 11:00	10 - 10 50/0	0.2		Weathered schist, water noted at 8.5 ft. ---------- End of Boring at 8.5 Ft
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-11**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/12/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	4 1/4 -inch HSA	split spoon	--	--
				I.D.	4 1/4 -inch	1 3/8 -inch		
				WT./Fall	--	140 lbs./30 in.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1				2 ft thick concrete slab. No sample.
-- 2					SM - Brown silty coarse to fine SAND, moist. weathered schist, quartz. HNU readings in borehole are 400 to 500 ppm, smells like paint thinner (methylene chloride?)
-- 3	S-2 13:55	50/5	0.2	peak of 15-20	**HXB11S2 (TCL, TAL, TOC)**
-- 4					
-- 5	S-3 14:10	48-52/6	0.7	peak of 15	Weathered schist, quartz
-- 6					End of Boring at 5.0 Ft
-- 7					
-- 8					
-- 9	S-5				
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-13**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 12/9/97
SURFACE ELEVATION:	DATUM: DRILLER: Jerry Heller	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	--	split spoon	--	--
				I.D.		1 3/8-inch		
				WT./Fall		sledge hamme		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1 11:30		0.4	0.2	6 inch thick concrete slab, used a jackhammer to break through. Pounded spoon - 2 ft. (by hand) sledgehammer. Dark yellow brown weathered schist, foliation is visable. **HXB13S1 (TCL, TAL, TPH, TCLP)** collected additional soil volume by hand
-- 2					
-- 3					
-- 4					
-- 5					
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-15**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/19/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE				
				I.D.				
				WT./Fall				

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1	21-28	1.3	0.4	6 inch thick concrete slab SM - Yellowish brown silty coarse to fine SAND, angular fine gravel, highly decomposed schist, dry.
-- 2	8:35	30-32			**HXB15S1 (TCL, TAL)**
-- 3	S-2	21-19	0.7	0.4	SM - Same as above.
-- 4	8:45	38-58			Tip is greenish black schist
-- 5					End of Boring at 4.5 Ft
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: B-16**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 12/9/97
SURFACE ELEVATION:	DATUM: DRILLER: Jerry Heller	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	--	split spoon	--	--
				I.D.		1 3/8-inch		
				WT./Fall		sledge hammer		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1	S-1 9:45		0.3	0.2	4 inch thick concrete slab, used jack hammer to break through. Few inches of reddish brown coarse to fine SAND, dry, some gravel, very weathered schist. Spoon refusal at 0.8 ft. **HXB16S1 (TCL, TAL)** Collected additional soil volume by hand
-- 2					
-- 3					
-- 4					
-- 5					
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: BK-1**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/17/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	--	split spoon	--	--
				I.D.		1 3/8-inch		
				WT./Fall		140 lbs / 30-inches		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1					Parking Lot, 4-inch thick gravel layer
					Auger to 2.5 ft with 4¼-inch HSAs
-- 2					
					SM - Green and yellow silty coarse to fine SAND, some gravel,
-- 3	S-1				weathered schist.
			1.1	0.2	Last 0.7 ft is black, fuel oil odor.
-- 4	11:30				**HXBK-1 (TCL/TAL, TOC,GS)**
-- 5					End of Boring at 4.5 Ft
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC **BORING LOG** **Boring No.: BK-2**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/17/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	--	split spoon	--	--
				I.D.		1 3/8-inch		
				WT./Fall		140 lbs./30 in.		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1					Grass Auger to 2.5 ft using 4¼-inch HSAs
-- 2					
-- 3	S-1		1.6	0.2	SM - Brown silty coarse to fine SAND, several schist pieces, dry. **HXBK2 (TCL, TAL, TOC, TPHC)**
-- 4	12:00				
-- 5					End of Boring at 4.5 Ft
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

TAMS CONSULTANTS, INC | **BORING LOG** | **Boring No.: BK-3**

PROJECT: Hexagon Laboratories	CONTRACTOR: Aquifer Drilling & Testing	PAGE 1 OF 1
PROJECT NO.: 5851-300	LOCATION: Bronx, New York	DATE: 11/17/97
SURFACE ELEVATION:	DATUM: DRILLER: Steve Wolf	TAMS REP.: P. Kareth

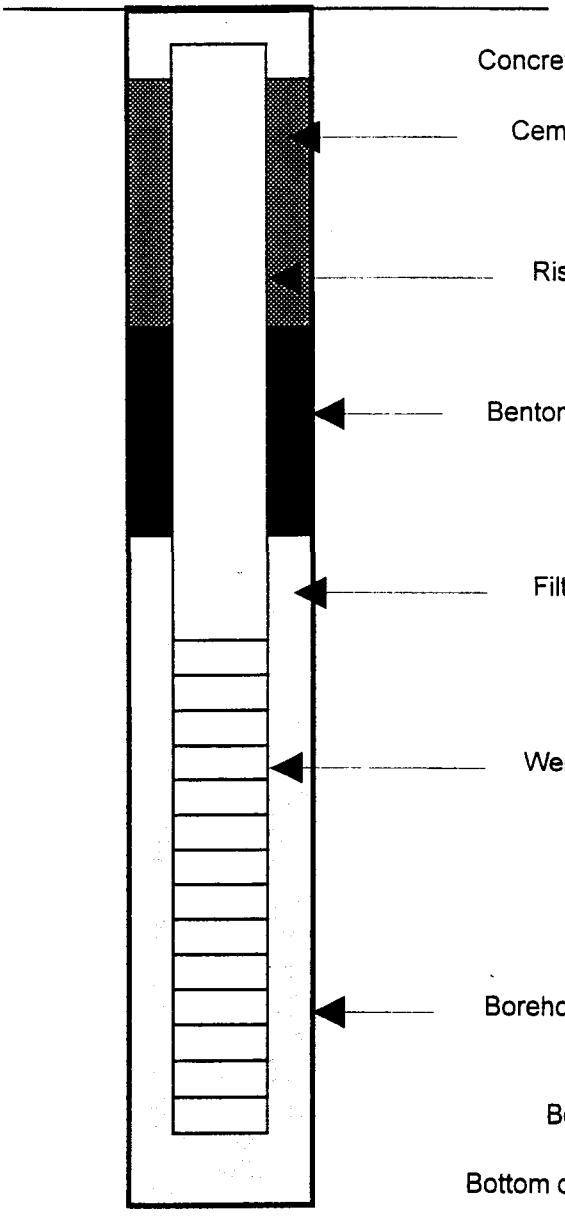
WATER LEVELS				DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		CASING	SAMPLER	CORE	TUBE
				TYPE	--	split spoon	--	--
				I.D.		2½-inch		
				WT./Fall		140 lbs / 30 inches		

Depth (ft)	Sample Number & Time	Blows per/6"	Recovery (feet)	HNu Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
-- 1					Unpaved area near gate to junk yard.
-- 2					Auger to 2.5 ft using 4¼-inch HSAs
-- 3	S-1		1.0	0.7	SM - Brown silty coarse to fine SAND, some gravel, large piece of rock in spoon, dry.
-- 4	11:00				**HXBK2 (TCL, TAL, TOC)**
-- 5					End of Boring at 4.5 Ft
-- 6					
-- 7					
-- 8					
-- 9					
--10					
--11					
--12					
--13					
--14					
--15					
--16					
--17					
--18					
--19					
--20					

MONITORING WELL INSTALLATION LOGS

TAMS CONSULTANTS, Inc. **Well No. MW-1**

Project: Hexagon Laboratories	Location: Bronx, New York	Page 1 of 1		
Project No.: 5851-300	Contractor: Aquifer Drilling & Testing	Water Levels		
Surface Elevation: 27.68 ft	Driller: Steve Wolf	Date	Time	Depth
Top of PVC	Well Permit No.:			
Casing Elevation: 27.15 ft	TAMS Rep.: Paul Kareth			
Datum: NGVD	Date of Completion: 11/19/97			



Concrete Seal, from GS ft. to -1.5 ft.

Cement-bentonite grout from -- ft. to -- ft.

Riser Pipe from -0.5 ft. to -5.5 ft.

Bentonite seal from -1.5 ft. to -3.5 ft.

Filter pack from -3.5 ft. to -16.5 ft.

Sand Size #1

Well screen from -5.5 ft. to -15.5 ft.

Diameter 2 inches
Slot size 0.01 inches
Type PVC

Borehole diameter: 6 inches

Bottom Cap at -15.5 ft.

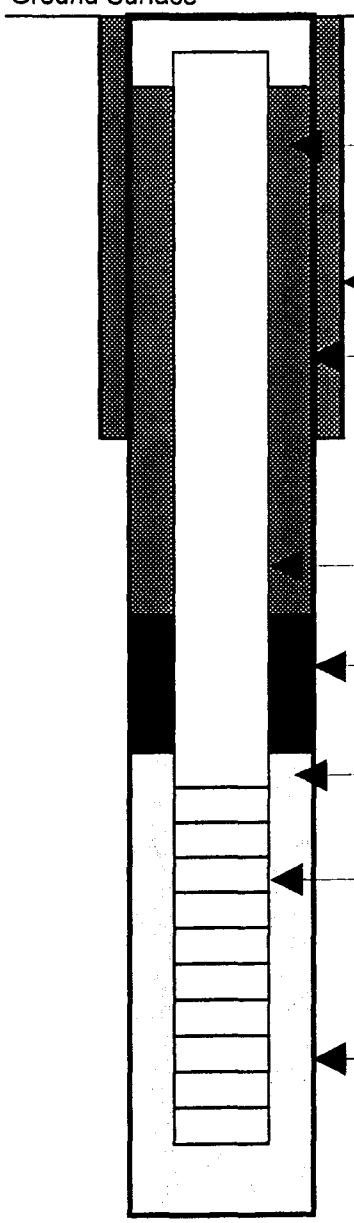
Bottom of Borehole at -16.5 ft.

Note: All measurements based on ground surface at 0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

TAMS CONSULTANTS, Inc. **Well No. MW-2**

Project: Hexagon Laboratories	Location: Bronx, New York	Page 1 of 1		
Project No.: 5851-300	Contractor: Aquifer Drilling & Testing	Water Levels		
Surface Elevation: 27.36 ft	Driller: Jerry Heller	Date	Time	Depth
Top of PVC	Well Permit No.:			
Casing Elevation: 27.06 ft	TAMS Rep.: Paul Kareth			
Datum: NGVD	Date of Completion: 12/8/97			



Concrete Seal, from GS ft. to -0.5 ft.

Cement-bentonite grout from -0.5 ft. to -35.5 ft.

Borehole diameter: 8 inches

Steel casing from -0.5 ft. to -35.5 ft.

Bottom of 8-inch borehole at 21.0 ft.

Riser Pipe from -0.4 ft. to -40.0 ft.

Bentonite seal from -35.5 ft. to -37.5 ft.

Filter pack from -37.5 ft. to -53.0 ft.
Sand Size #2

Well screen from -40.0 ft. to -50.0 ft.
Diameter 2 inches
Slot size 0.01 inches
Type PVC

Borehole diameter: 6 inches

Bottom Cap at 50.0 ft.

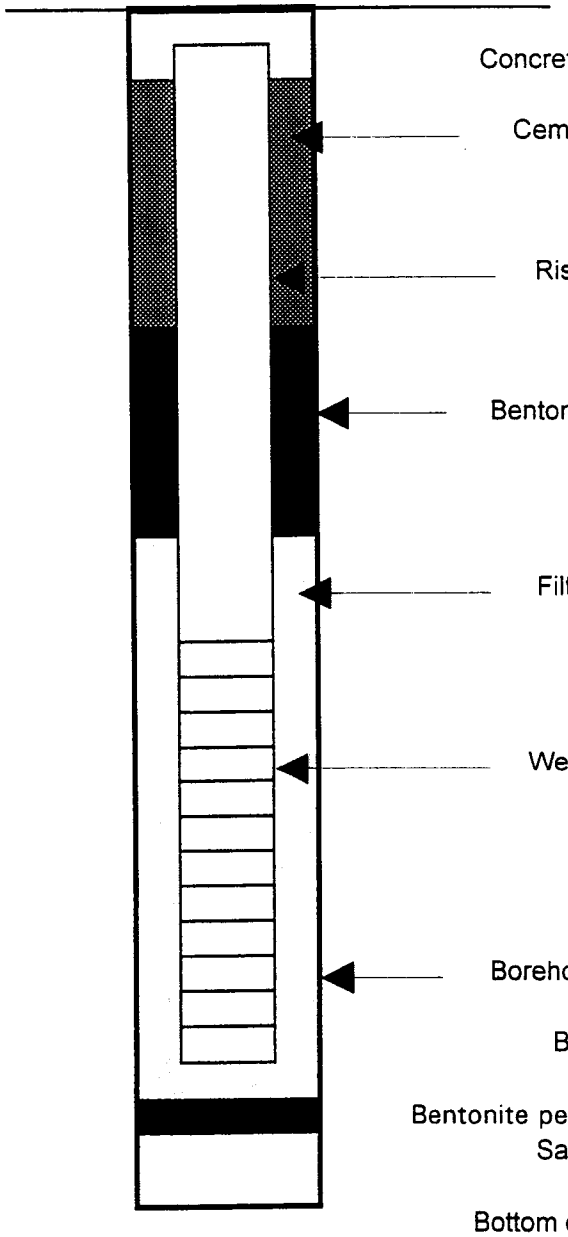
Bottom of Borehole at 53.0 ft.

Note: All measurements based on ground surface at 0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

TAMS CONSULTANTS, Inc. **Well No. MW-3**

Project: Hexagon Laboratories	Location: Bronx, New York	Page 1 of 1		
Project No.: 5851-300	Contractor: Aquifer Drilling & Testing	Water Levels		
Surface Elevation: 37.63 ft	Driller: Steve Wolf	Date	Time	Depth
Top of PVC	Well Permit No.:	11/13/98	16:00	3.7
Casing Elevation: 37.46 ft	TAMS Rep.: Paul Kareth	11/14/98	9:00	3.7
Datum: NGVD	Date of Completion: 11/14/97			



Concrete Seal, from 2.5 ft. to GS ft.

Cement-bentonite grout from -1.5 ft. to GS ft.

Riser Pipe from -0.4 ft. to -3.0 ft.

Bentonite seal from -1.5 ft. to -2.5 ft.

Filter pack from -2.5 ft. to -14.0 ft.

Sand Size #1

Well screen from -3.0 ft. to -13.0 ft.

Diameter 6 inches
Slot size 0.01 inches
Type PVC

Borehole diameter: 6 inches

Bottom Cap at -13.0 ft.

Bentonite pellet seal from -14.0 ft. to -15.0 ft.
Sand pack from -15.0 ft. to -23.0 ft.

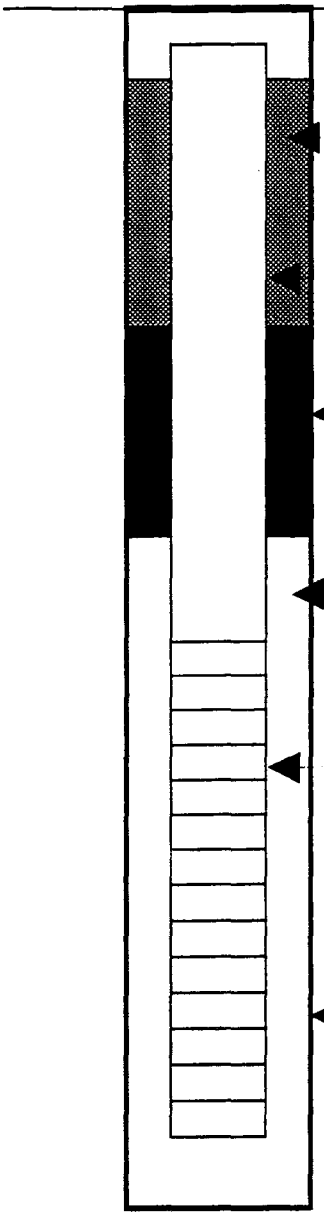
Bottom of Borehole at -23.0 ft.

Note: All measurements based on ground surface at 0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

TAMS CONSULTANTS, Inc. **Well No. MW-4**

Project: Hexagon Laboratories	Location: Bronx, New York	Page 1 of 1		
Project No.: 5851-300	Contractor: Aquifer Drilling & Testing	Water Levels		
Surface Elevation: 37.16 ft	Driller: Jerry Heller	Date	Time	Depth
Top of PVC	Well Permit No.:			
Casing Elevation: 36.80 ft	TAMS Rep.: Paul Kareth			
Datum: NGVD	Date of Completion: 12/8/97			



Concrete Seal, from GS ft. to -0.5 ft.

Cement-bentonite grout from -- ft. to -- ft.

Riser Pipe from -0.4 ft. to -3.0 ft.

Bentonite seal from -0.5 ft. to -2.0 ft.

Filter pack from -2.0 ft. to -14.0 ft.

Sand Size #2

Well screen from -3.0 ft. to -13.0 ft.

Diameter 6 inches
Slot size 0.01 inches
Type PVC

Borehole diameter: 6 inches

Bottom Cap at -13.0 ft.

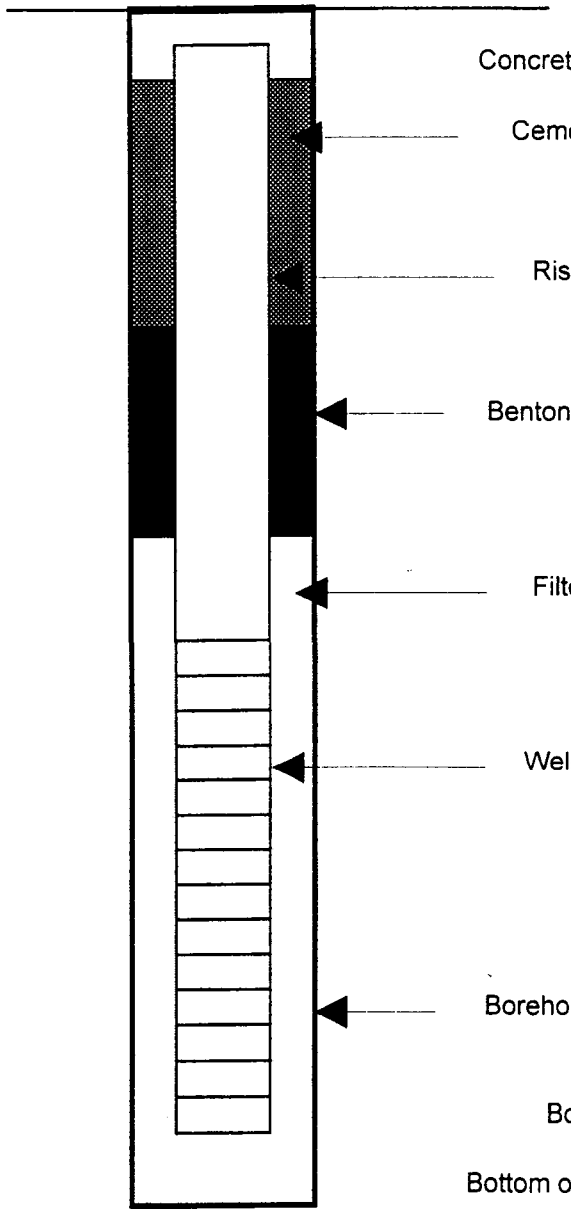
Bottom of Borehole at -14.0 ft.

Note: All measurements based on ground surface at 0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

TAMS CONSULTANTS, Inc. **Well No. MW-5**

Project: Hexagon Laboratories	Location: Bronx, New York	Page 1 of 1		
Project No.: 5851-300	Contractor: Aquifer Drilling & Testing	Water Levels		
Surface Elevation: 38.49 ft	Driller: Steve Wolf	Date	Time	Depth
Top of PVC Casing Elevation: 38.06 ft	Well Permit No.:			
	TAMS Rep.: Paul Kareth			
Datum: NGVD	Date of Completion: 11/17/97			



Concrete Seal, from GS ft. to -2.0 ft.

Cement-bentonite grout from -- ft. to -- ft.

Riser Pipe from -0.5 ft. to -5.0 ft.

Bentonite seal from -2.0 ft. to -3.5 ft.

Filter pack from -3.5 ft. to -16.0 ft.

Sand Size #1

Well screen from -5.0 ft. to -15.0 ft.

Diameter 2 inches
Slot size 0.01 inches
Type PVC

Borehole diameter: 6 inches

Bottom Cap at -15.0 ft.

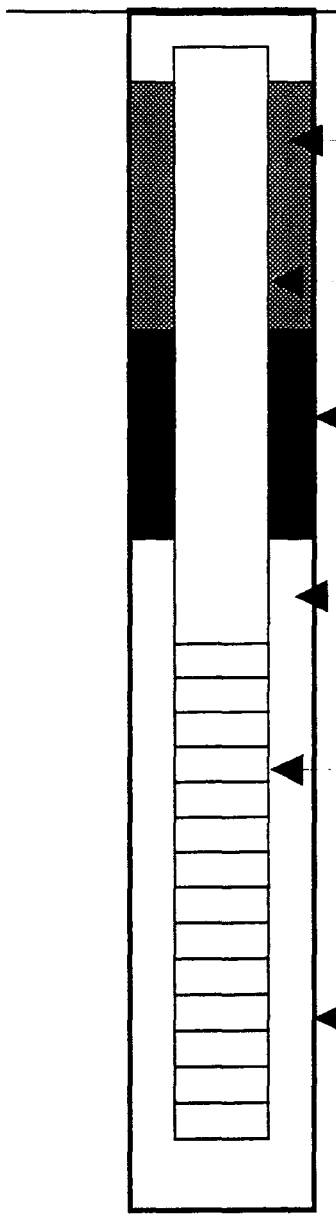
Bottom of Borehole at -16.0 ft.

Note: All measurements based on ground surface at 0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

TAMS CONSULTANTS, Inc. **Well No. MW-6**

Project: Hexagon Laboratories	Location: Bronx, New York	Page 1 of 1		
Project No.: 5851-300	Contractor: Aquifer Drilling & Testing	Water Levels		
Surface Elevation: 34.15 ft	Driller: Steve Wolf	Date	Time	Depth
Top of PVC Casing Elevation: 33.76 ft	Well Permit No.:			
	TAMS Rep.: Chris Purkiss			
Datum: NGVD	Date of Completion: 1/16/98			



Concrete Seal, from GS ft. to 0.5 ft.

Cement-bentonite grout from -- ft. to -- ft.

Riser Pipe from 0.5 ft. to 5.0 ft.

Bentonite seal from 1.0 ft. to 3.0 ft.

Filter pack from 3.0 ft. to 15.5 ft.

Sand Size #1 Morie

Well screen from 5.0 ft. to 15.0 ft.

Diameter 2 inches
Slot size 0.01 inches
Type PVC

Borehole diameter: 6 inches

Bottom Cap at 15.0 ft.

Bottom of Borehole at 15.5 ft.

Note: All measurements based on ground surface at 0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

MONITORING WELL DEVELOPMENT LOGS

HEXAGON SITE
MONITORING WELL DEVELOPMENT DATA SHEET

Monitoring well number: MW-1
date: 12/15/97 Time: 9:20
water level: 9.36 ft Total depth of well: 14.8 ft
One casing volume: 0.9 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp	NTU		Comments
9:25	1	7.11	100	10x	13	>200		dark gray, silty
9:35	2	7.22	90	10x	12	>200		silty, dark gray,
								well went dry
14:45								WL - 9.50 ft
14:49								begin pumping
14:50	2	7.17	95	10x	8	>200		silty, dark gray
14:51	2.5							well went dry
	total of 4.5 gallons removed							

Type of pump: 2 stage Whale pump, approximately 2 GPM

HEXAGON SITE
MONITORING WELL DEVELOPMENT DATA SHEET

Monitoring well number: MW-2
date: 12/15/97 Time: 8:15
water level: 10.56 ft Total depth of well: 50.5 ft
One casing volume: 6.53 gallons

Time	Gallons Purged	pH	Conductivity Value	scale	Temp	NTU		Comments
8:27	6	6.81	110	10x	14	59.2		
8:35	12	6.77	82	10x	13	96.9		
8:47	19	6.74	70	10x	13	>200		
9:00	26	6.73	80	10x	13	>200		
9:15	31	6.71	80	10x	13	>200		well went dry
								pumping depth
								at 20.4 ft
9:40								pump on
9:47	36	6.74	70	10x	13	>200		well went dry after
								5 minutes
13:40								WL - 11.26
13:41								pump on
13:45	6	6.81	82	10x	11	>200		
13:50	13	6.83	85	10x	12	>200		
13:56	27	6.79	82	10x	11	>200		
14:08	36	6.83	80	10x	10	>200		
14:15								WL - 27.8 ft
14:16	42	6.81	81	10x	9	>200		
14:26	50	6.77	81	10x	10	>200		
14:36	56	6.80	70	10x	11	>200		
14:40	58							end purging
	total of 96 gallons removed							

Type of pump: 2 stage Whale pump

HEXAGON SITE
MONITORING WELL DEVELOPMENT DATA SHEET

Monitoring well number: MW-3
date: 12/15/97 Time: 13:02
water level: 3.85 ft Total depth of well: 12.7 ft
One casing volume: 1.61 gallons

Time	Gallons Purged	pH	Conductivity Value	scale	Temp	NTU		Comments
13:12								pump on
13:13	2	7.01	138	10x	8	>200		
13:15	6	6.98	150	10x	11	>200		
13:17	8	7.26	140	10x	12	>200		
13:19	10	7	130	10x	11	>200		flow fluctuating
13:22	13	7.01	130	10x	9	>200		
13:27	15	6.97	125	10x	10	>200		
13:32	17	6.93	129	10x	11	>200		pump off
15:25								WL - 4.22
15:30								pump on
15:32	3	7.04	89	10x	6	>200		
15:34	7							pump is cycling
15:37	9	6.99	90	10x	6	>200		
15:40	10							pump off
	total of 27 gallons removed							

Type of pump: 2 stage Whale pump

HEXAGON SITE
MONITORING WELL DEVELOPMENT DATA SHEET

Monitoring well number: MW-4
date: 12/15/97 Time: 10:00
water level: 3.08 ft Total depth of well: 13.2 ft
One casing volume: 1.71 gallons

Time	Gallons Purged	pH	Conductivity Value	scale	Temp	NTU		Comments
10:00	2	6.99	110	10x	9	>200		dark gray, odor
10:11	23	7.04	100	10x	11	>200		dark gray
10:15	28	7.02	115	10x	11	>200		
10:20	37	7.05	110	10x	11	>200		
10:25	62	7.05	105	10x	11	>200		
10:32	76	6.98	120	10x	12	>200		
10:38	91	7.03	120	10x	11	>200		
11:06	131	7.08	110	10x	11	>200		clearing up
11:15	145	7.00	125	10x	13	76		
11:31	170	7.01	120	10x	10	68		pumping level 8.6 ft
11:46	187	7.02	125	10x	11	99.8		
12:00	224	7.04	125	10x	11	86.3		
12:08	235							end pumping
	total of 235 gallons removed							

Type of pump: 2 stage Whale pump
HNu peaking at 10 to 15 ppm
Sheen noted on water level probe and pump hose

HEXAGON SITE
MONITORING WELL DEVELOPMENT DATA SHEET

Monitoring well number: MW-5
date: 12/15/97 Time: 12:15
water level: 2.04 ft Total depth of well: 13.7 ft
One casing volume: 1.91 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp	NTU		Comments
12:23								pump on
12:28	10	6.83	429	1x	8	>200		gray, odor
12:32	15	6.82	89	10x	9	>200		
12:36	18	6.82	90	10x	10	50.7		
12:43	20							flow fluctuating
12:46	21	6.93	89	10x	7	135.7		
13:55	30							pump off, dry
14:45								WL - 2.38 ft
15:00	5	7.08	89	10x	9	>200		
15:10	10	7.05	89	10x	10	>200		pump is cycling
15:15	13	7.07	89	10x	8	>200		dry
	total of 43 gallons removed							

Type of pump: 2 stage Whale pump

HEXAGON SITE
MONITORING WELL DEVELOPMENT DATA SHEET

Monitoring well number: MW-6
date: 1/21/98 Time: 7:45
water level: 6.30 ft Total depth of well: 15.0 ft
One casing volume: 1.58 gallons

Time	Gallons Purged	pH	Conductivity Value	scale	Temp	NTU		Comments
8:27								pump on
8:29	1	7	68	10x	5	6.2		
8:37	8	7.56	355	1x	2	1.8		
8:43	13	7.74	65	10x	3			
8:50	26	7.77	65	10x	3	0.98		
8:56	37	7.78	65	10x	3	122		lifted pump and
								broke suction,
								cloudy
9:05	54	7.8	60	10x	3	4.1		cleared quickly
9:13	69	7.8	62	10x	3.5	3.68		
9:26	94	7.83	435	1x	3	1.6		
9:34	106	7.82	60	10x	3	1.8		
9:38								pump off
	total of 108 gallons removed							

Type of pump: 2 stage Whale pump

GROUNDWATER SAMPLING LOGS

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-1
Date: 1/2/98 Time: 7:55
Weather: sunny Temperature: 20s to low 40s
Water level: 8.56 ft Total depth of well: 14.8 ft
One casing volume: 1.03 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
9:10								begin purging
9:11	0.5	6.73	69	10	13	>200		
9:30	4	6.7	60	10	11	>200		end purging
11:30		6.73	65	10	9	16		sample collection

Type of pump: purged using a dedicated disposable bailer
sampled using a new dedicated disposdable bailer
Dissolved metals sample filtered using dedicated disposable 45 micron filters

Sample analyses: TCL VOCs, SVOCs, Pest/PCBs, TAL metals (disolved and total), total cyanides,TSS, TDS, TOC.

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-2
Date: 1/2/98 Time: 8:15
Weather: sunny Temperature: 20s to low 40s
Water level: 9.61 ft Total depth of well: 50.5 ft
One casing volume: 6.7 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
9:45								begin purging
9:46	0.5	5.52	59	10	12	>200		
10:05	10	6.64	79	10	13	>200		
10:30	20	6.97	72	10	12	59.4		end purging
13:00		6.81	80	10	12	61.2		sample collection
								Floating precipitate
								in total cyanides
								sample bottle

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled using a new dedicated disposdable bailer
Dissolved metals sample filtered using dedicated disposable 45 micron filters

Sample analyses: TCL VOCs, SVOCs, Pest/PCBs, TAL metals (disolved and total),
total cyanides,TSS, TDS, TOC.

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-3
Date: 1/2/98 Time: 8:30
Weather: sunny Temperature: 20s to low 40s
Water level: 3.07 ft Total depth of well: 12.7 ft
One casing volume: 1.6 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
10:45								begin purging
10:46	0.5	7.3	132	10	9.4	>200		
10:48	6	6.9	125	10	9	46.5		end purging
14:10								collect field blank
14:50		7.1	85	10	8	143.4		collect sample
								collected field
								duplicate sample
								MW-53

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled using a new dedicated disposdable bailer
Dissolved metals sample filtered using dedicated disposable 45 micron filters

Sample analyses: TCL VOCs, SVOCs, Pest/PCBs, TAL metals (disolved and total),
total cyanides,TSS, TDS, TOC.

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-4
Date: 1/2/98 Time: 9:25
Weather: sunny Temperature: 20s to low 40s
Water level: 2.30 ft Total depth of well: 12.3 ft
One casing volume: 1.63 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
12:25								begin purging
12:26	1	7.7	112	10	8	>200		brown oily sheen
								noted on water
12:35	6	7.05	121	10	9	>200		end purging
16:20		7.35	118	10	7	>200		sample collected

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled using a new dedicated disposdable bailer
Dissolved metals sample filtered using dedicated disposable 45 micron filters

Sample analyses: TCL VOCs, SVOCs, Pest/PCBs, TAL metals (disolved and total),
total cyanides,TSS, TDS, TOC.

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-5
Date: 1/2/98 Time: 9:35
Weather: sunny Temperature: 20s to low 40s
Water level: 1.82 ft Total depth of well: 13.7 ft
One casing volume: 1.96 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
16:45								begin purging
16:46	1	6.81	92	10	9	>200		
16:55	6	6.91	99	10	10	>200		end purging
		6.85	89	10	9	66.4		collected sample

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled using a new dedicated disposdable bailer
Dissolved metals sample filtered using dedicated disposable 45 micron filters

Sample analyses: TCL VOCs, SVOCs, Pest/PCBs, TAL metals (disolved and total),
total cyanides,TSS, TDS, TOC.

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-6
Date: 2/18/98 Time: 10:50
Weather: light rain Temperature: low 40s
Water level: 5.79 ft Total depth of well: 14.8 ft
One casing volume: 1.5 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
11:10	0.5	7.68	55	10x	10	120		begin purging
11:14	3	7.71	65	10x	10	29.8		
11:17	5	7.73	65	10x	10	17.5		
11:20	7.5	7.75	75	10x	10	16.2		end purging
								1.3 gpm
11:50		7.58	50	10x	9	1.94		initial sample reading
11:58		7.65	55	10x	9	low bat		final sample reading

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled with dedicated disposable bailer

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-1
Date: 3/5/98 Time: 8:15
Weather: partly sunny Temperature: upper 30s to upper 40s
Water level: 7.60 ft Total depth of well: 14.8 ft
One casing volume: 1.17 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
8:15								HNu: 0.2
9:10								begin purging
9:11	1	7.74	100	10x	9	>200		
9:20	4	7.61	110	10x	10	>200		end purging
10:30		7.67	107.5	10x	13	61		Sample - initial
		7.79	102.5	10x	13	>200		Sample - final

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled with dedicated disposable bailer

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-2
Date: 3/5/98 Time: 8:17
Weather: partly sunny Temperature: upper 30s to upper 40s
Water level: 8.18 ft Total depth of well: 50.5 ft
One casing volume: 6.9 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
8:17								HNu: Background
9:30								
9:31	1.5	7.25	800	10x	12	>200		begin purging
9:33	3	7.2	800	10x	13	35		
9:35	6	7.28	850	10x	12	>200		
9:38	8	7.32	850	10x	12	>200		lost suction
9:43	11	7.28	850	10x	12	>200		
9:45	14	7.31	860	10x	13	>200		
9:47	16	7.32	830	10x	13	60		
9:50	18	7.33	840	10x	13	53		Well Dropped Below
10:06	21	7.29	820	10x	12	46		20 ft-10 min. recharge
10:10	24	7.35	830	10x	13	125		(only 20 ft of hose)
10:13	27	7.36	850	10x	13	100		
10:17	30	7.33	830	10x	13	44		
10:20	33							
11:00		7.46	820	10x	12	36		Sample - initial
		7.44	810	10x	12	100		Sample - final

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled with dedicated disposable bailer

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-3
Date: 3/5/98 Time: 8:45
Weather: partly sunny Temperature: upper 30s to upper 40s
Water level: 3.32 ft Total depth of well: 12.7 ft
One casing volume: 1.54 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
8:45								HNu: 1.2 BG 0.2
11:30								
11:31	1	8.27	1000	10x	9	56		begin purging
11:33	3	8.21	1200	10x	9	40		
11:36	5	7.64	750	10x	9	61		
11:38	6	7.63	1250	10x	10	60		
11:40	8	7.66	1250	10x	9	55		
12:03		7.66	1200	10x	9	24		Sample - initial
		7.6	1200	10x	9	137		Sample - final
	MW-3 @ 11:45							
	DUP HX MW-53 @ 1200							

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled with dedicated disposable bailer

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-4
Date: 3/5/98 Time: 8:51
Weather: partly sunny Temperature: upper 30s to upper 40s
Water level: 2.07 ft Total depth of well: 12.3 ft
One casing volume: 4.66 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
15:00								HNu: Peak 15 ppm
								Strong odor
15:20								
15:22	3	7.18	1450	10x	9	>200		begin purging
15:25	6	7.1	1450	10x	9	>200		
15:27	8	7.3	1350	10x	9	>200		
15:29	9	7.29	1500	10x	9	>200		stop purging
16:00		7.57	1500	10x	9	>200		Sample - initial
		7.7	1475	10x	9	>200		Sample - final
Discharge Water is buff white, oily sheen, very small oil globules								
	Filtered Water is bluish							

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled with dedicated disposable bailer

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-5
Date: 3/5/98 Time: 8:55
Weather: partly sunny Temperature: upper 30s to upper 40s
Water level: 1.57 ft Total depth of well: 13.7 ft
One casing volume: 2 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
8:55								
15:20								
16:31	3	7.38	1050	10x	10	>200		begin purging
16:33	6	7.34	1000	10x	10	>200		
16:37	9	7.37	1000	10x	10	>200		
16:41	10	7.48	1000	10x	10	>200		stop purging
17:00		7.52	1000	10x	10	137		Sample - initial
		7.57	900	10x	10	>200		Sample - final
Discharge Water is buff white, oily sheen, very small oil globules								
	Filtered Water is bluish							

Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled with dedicated disposable bailer

HEXAGON SITE
MONITORING WELL PURGING & SAMPLING SHEET

Monitoring well number: MW-6
Date: 3/5/98 Time: 13:45
Weather: partly sunny Temperature: upper 30s to upper 40s
Water level:5.92 ft Total depth of well: 14.8 ft
One casing volume: 1.62 gallons

Time	Gallons Purged	pH	Conductivity Value	Conductivity scale	Temp °C	NTU		Comments
13:45								HNu: BG
14:00								
14:02	1	7	650	10x	11	86		begin purging
14:06	4	7.55	700	10x	12	12		
14:08	7	7.5	700	10x	11	19		
14:09	8.5							stop purging
14:10		7.36	680	10x	11	5		Sample - initial
14:25		7.29	650	10x	11	33		Sample - final
MS/MSD 1 set								
Did not have 2 sets for MS/MSD								

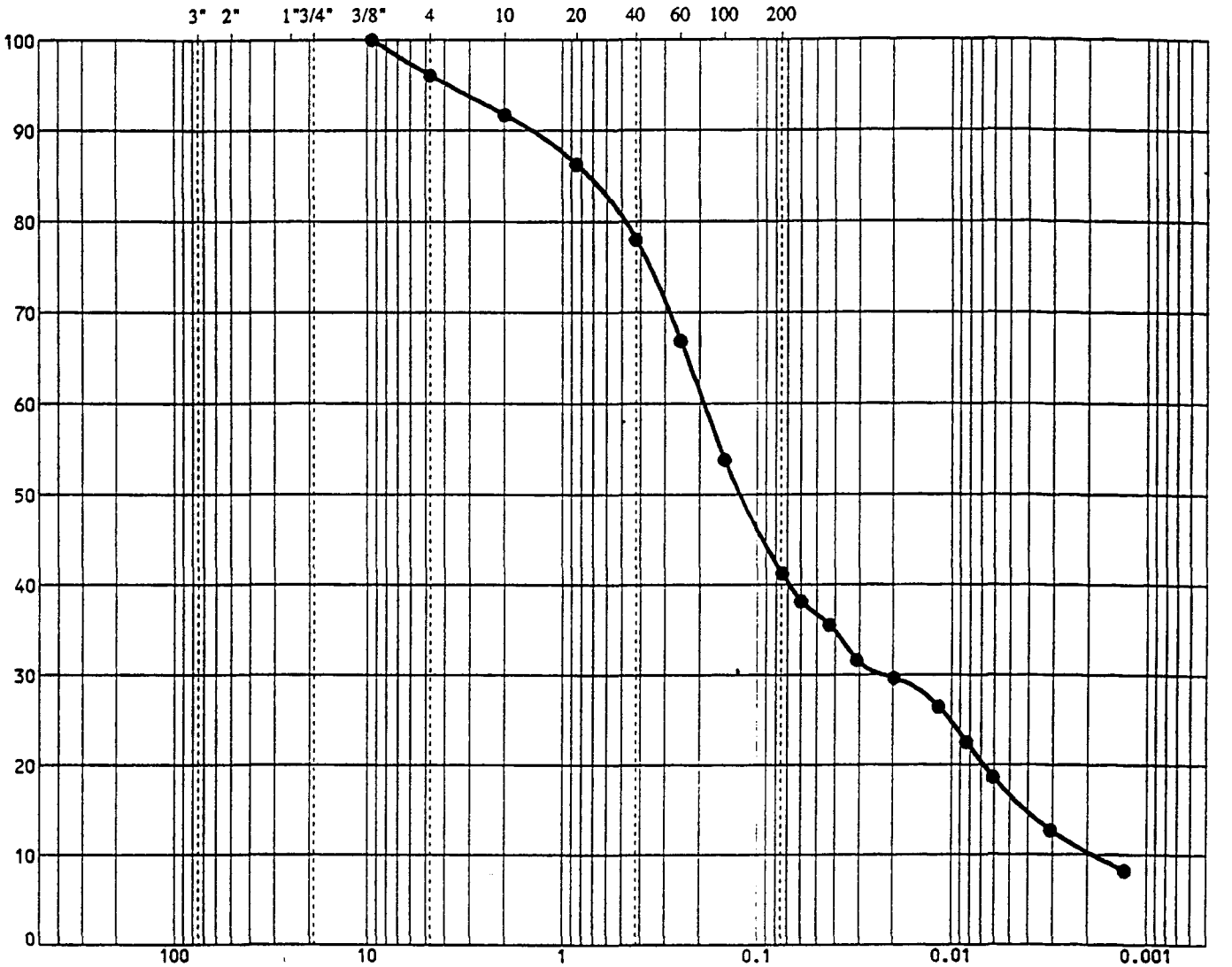
Type of pump: Honda centrifugal pump with dedicated black poly tubing
sampled with dedicated disposable bailer

APPENDIX C

GEOTECHNICAL ANALYSIS RESULTS

Boulders	COBBLES	GRAVEL		SAND			FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt Sizes	Clay Sizes

U.S. STANDARD SIEVE SIZES



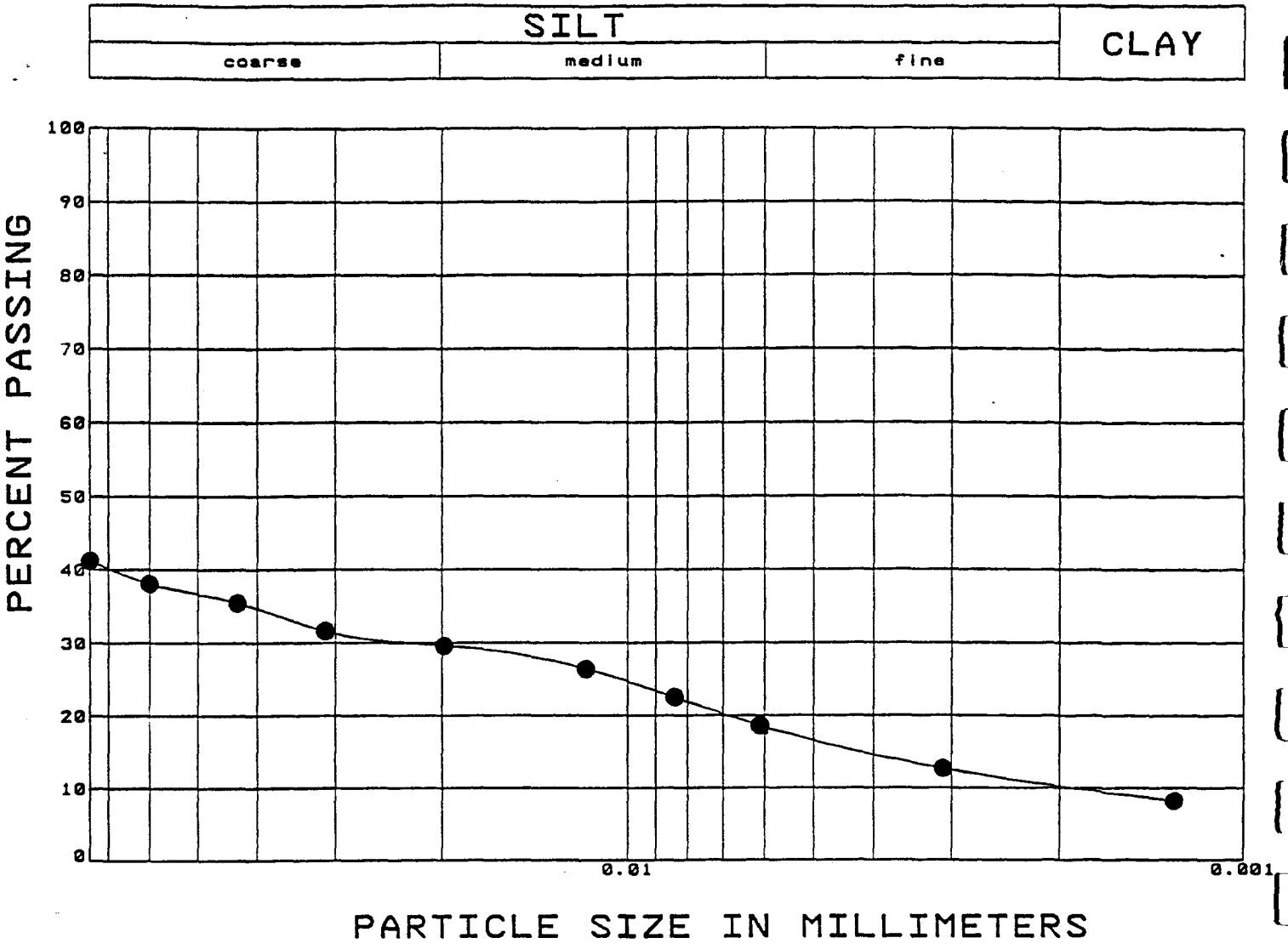
	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION
●	0.0					

GRAIN SIZE DISTRIBUTION

HXB552 (D 1875-01)

SAMPLE NUMBER	AB-36302
PROJECT NUMBER	106
PROJECT	Pensacola Laboratories

LAW ENGINEERING & ENVIRONMENTAL SERVICES, INC.



LEGEND	LOCATION	DEPTH (feet)
●	AB-36302	0.0

(D1875-01)

HXB552

Pensacola Laboratories

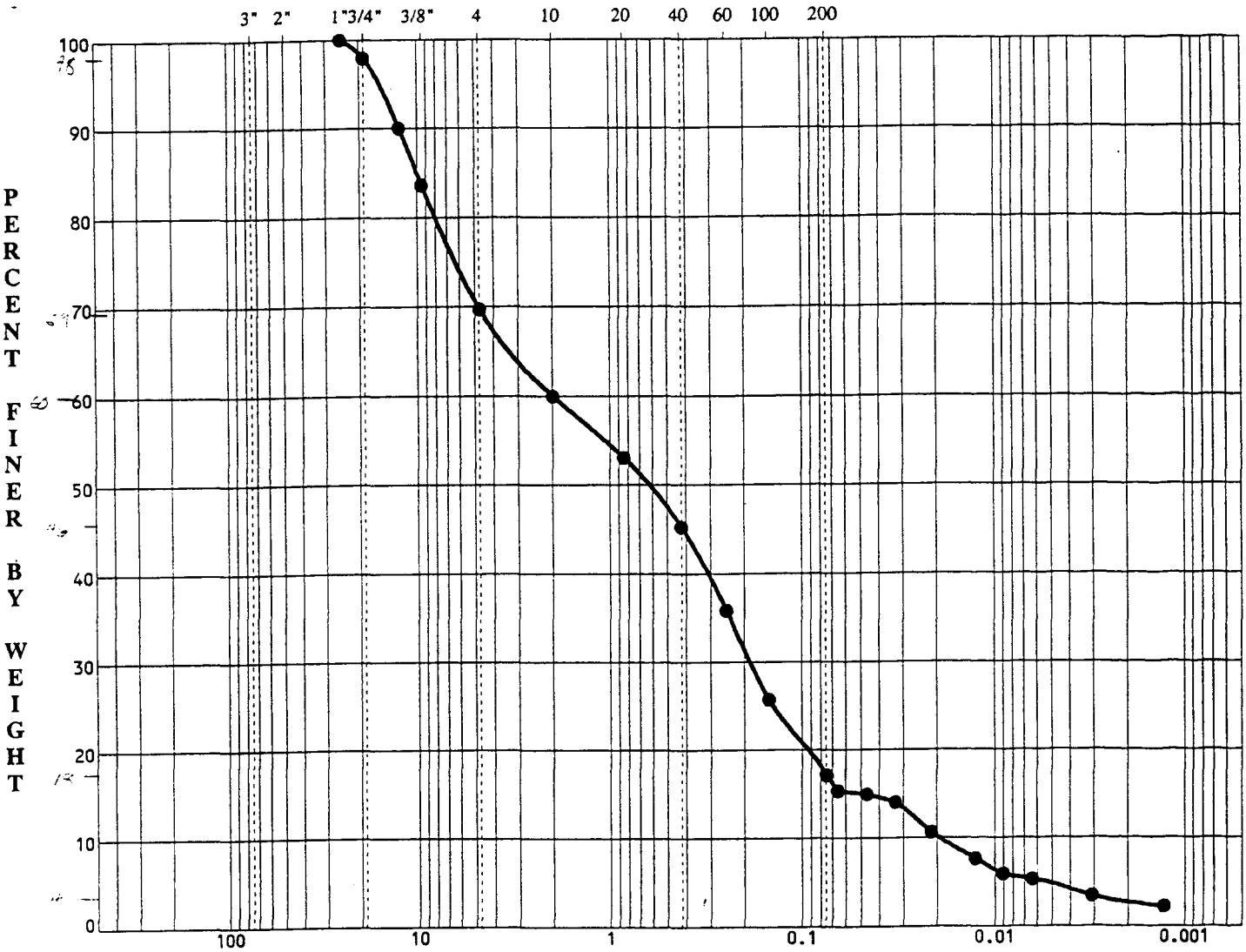
106

HYDROMETER ANALYSIS

Law Engineering Birmingham

Boulders	COBBLES	GRAVEL		SAND			FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt Sizes	Clay Sizes

U.S. STANDARD SIEVE SIZES

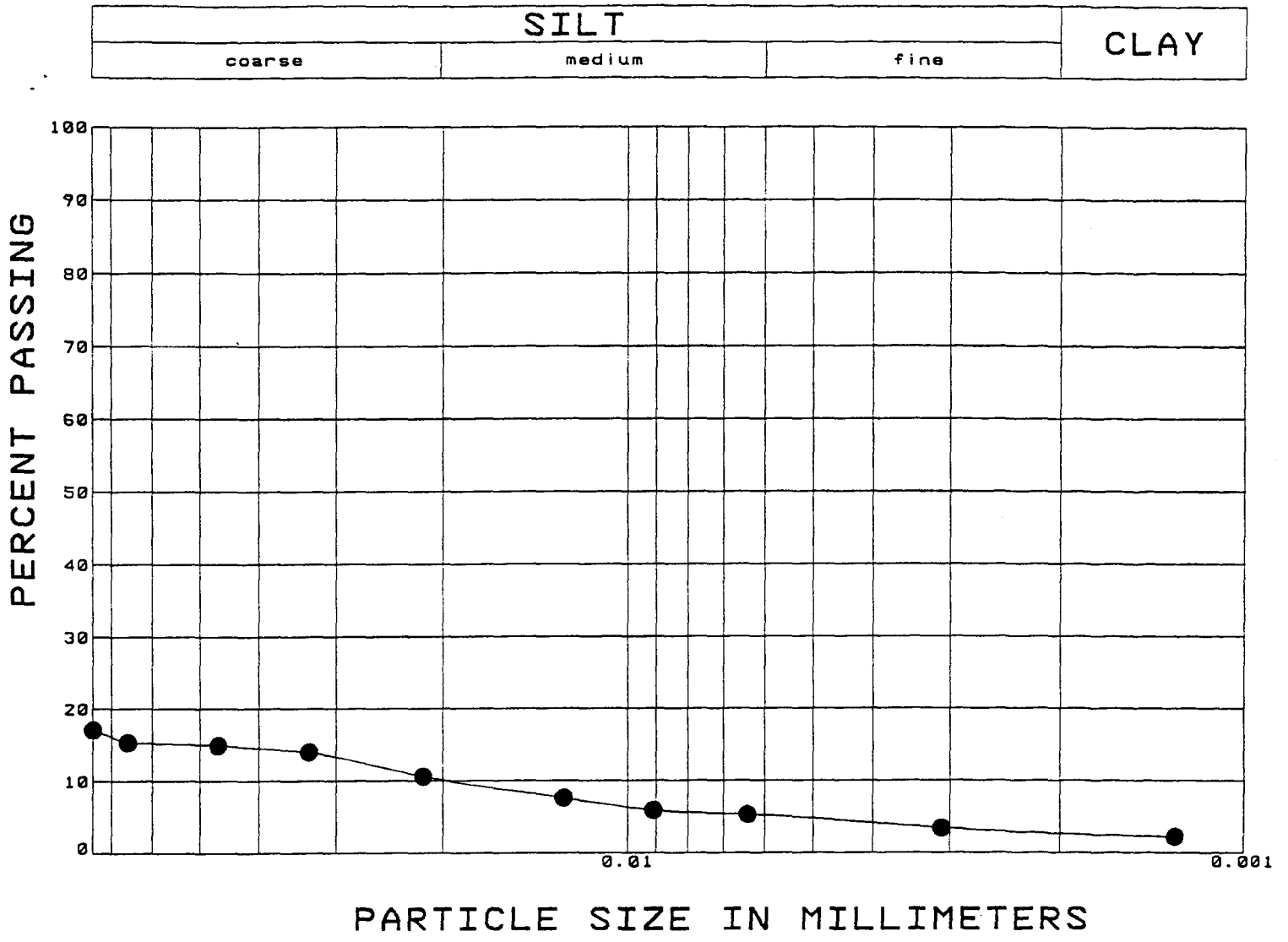


	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION
●						

GRAIN SIZE DISTRIBUTION

SAMPLE NUMBER	AB-40453 HXB6 S1
PROJECT NUMBER	106
PROJECT	Pensacola Laboratories

LAW ENGINEERING & ENVIRONMENTAL SERVICES, INC.



LEGEND	LOCATION	DEPTH (feet)
●	AB-40453	

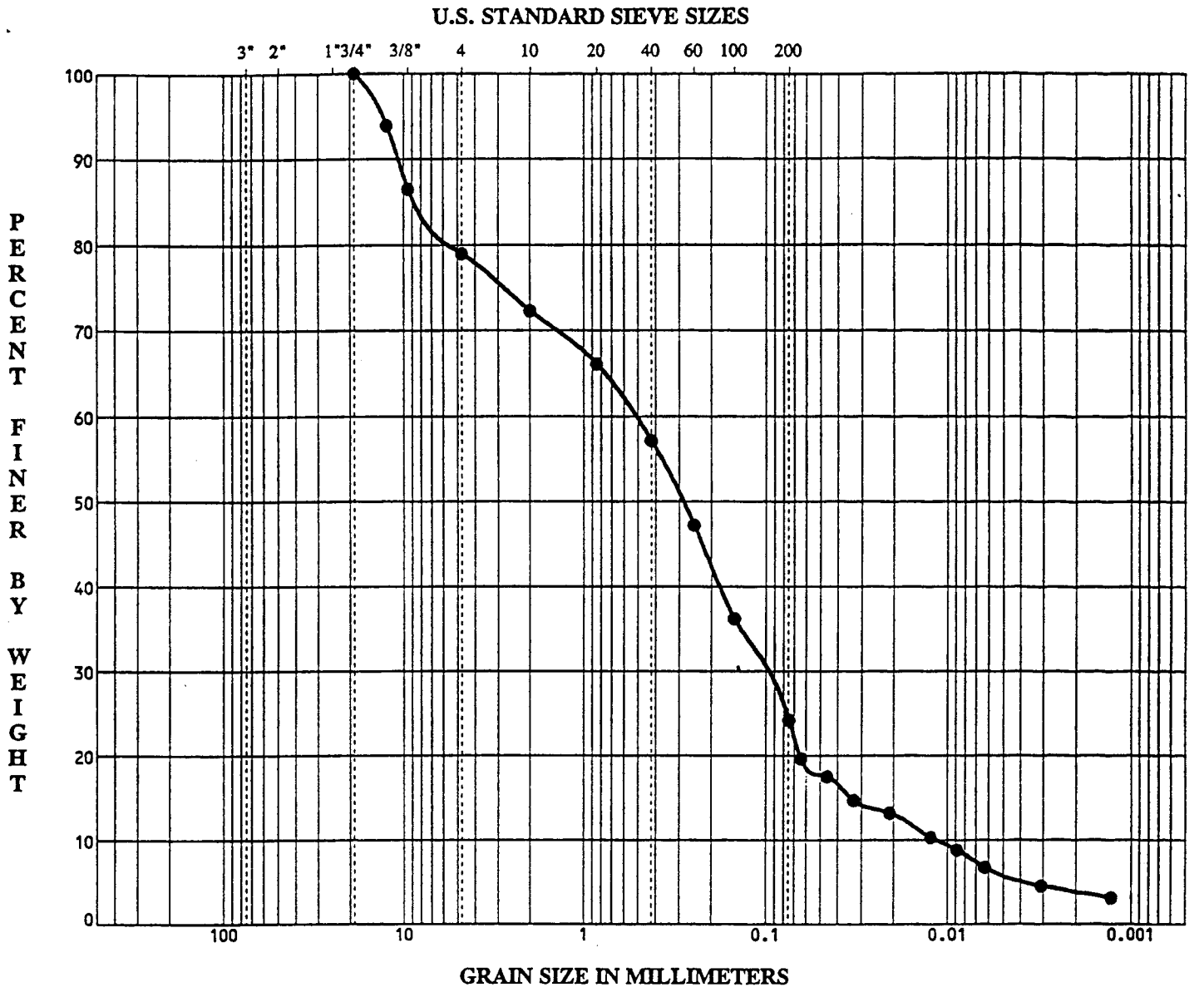
HXB6S1

Pensacola Laboratories

106

HYDROMETER ANALYSIS

Boulders	COBBLES	GRAVEL		SAND			FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt Sizes	Clay Sizes



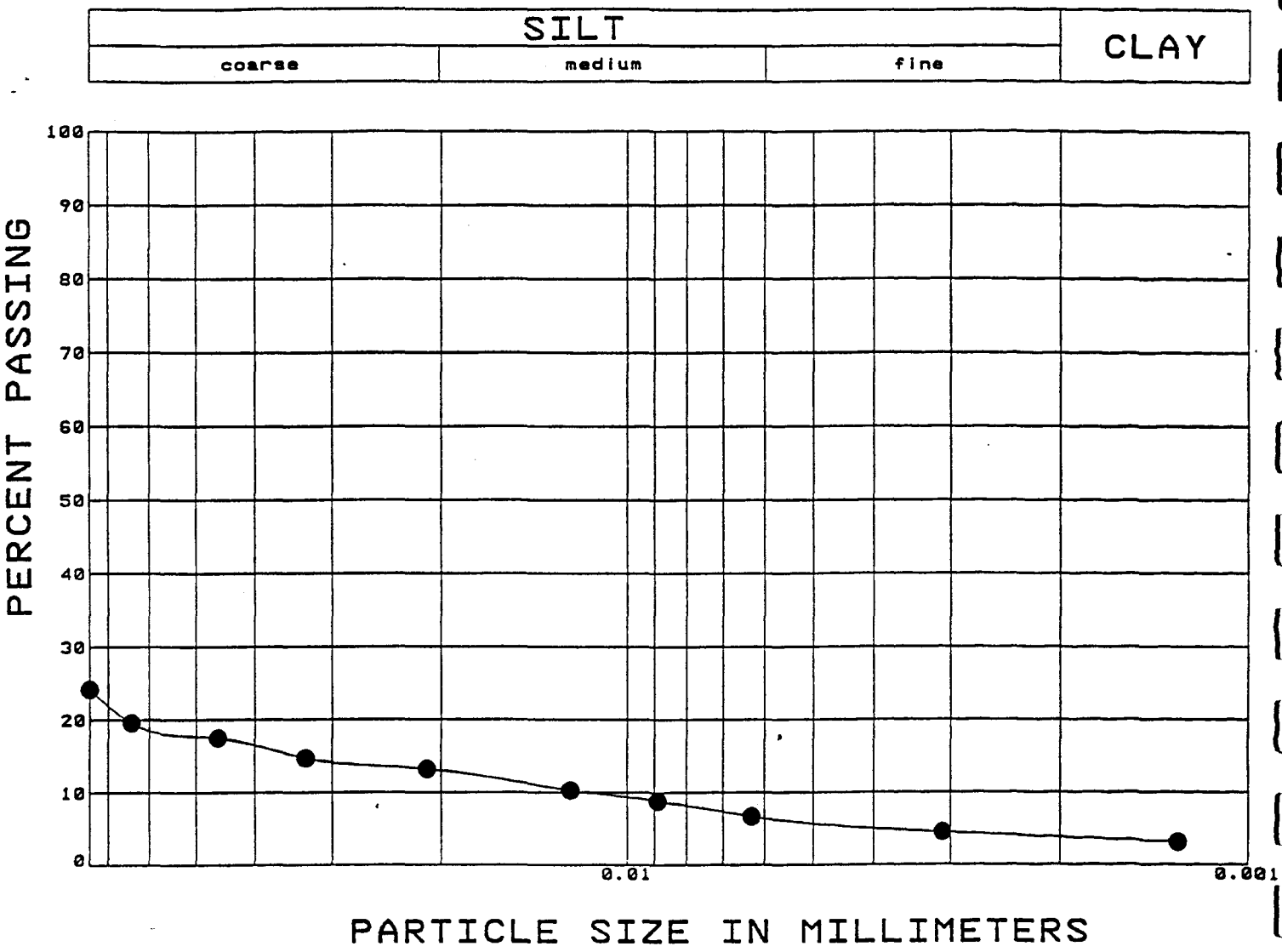
	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION
●	0.0					

GRAIN SIZE DISTRIBUTION

HXB754 (D1848-02)

SAMPLE NUMBER	AB-36299
PROJECT NUMBER	106
PROJECT	Pensacola Laboratories

LAW ENGINEERING & ENVIRONMENTAL SERVICES



LEGEND	LOCATION	DEPTH (feet)
●	AB-36299	0.0

(D1892-02)

HXB754

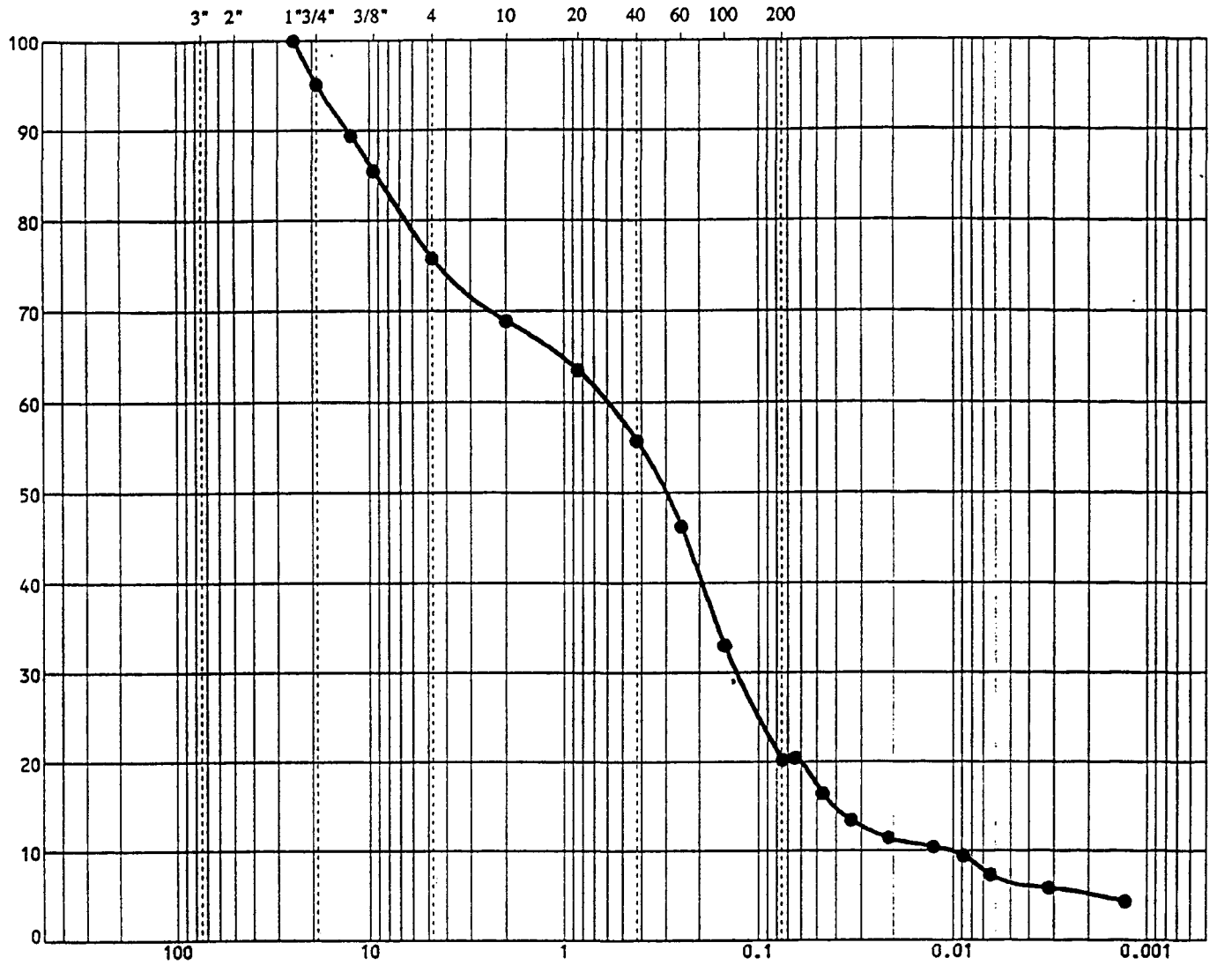
Pensacola Laboratories

106

HYDROMETER ANALYSIS

Boulders	COBBLES	GRAVEL		SAND			FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt Sizes	Clay Sizes

U.S. STANDARD SIEVE SIZES



	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION
●	0.0					

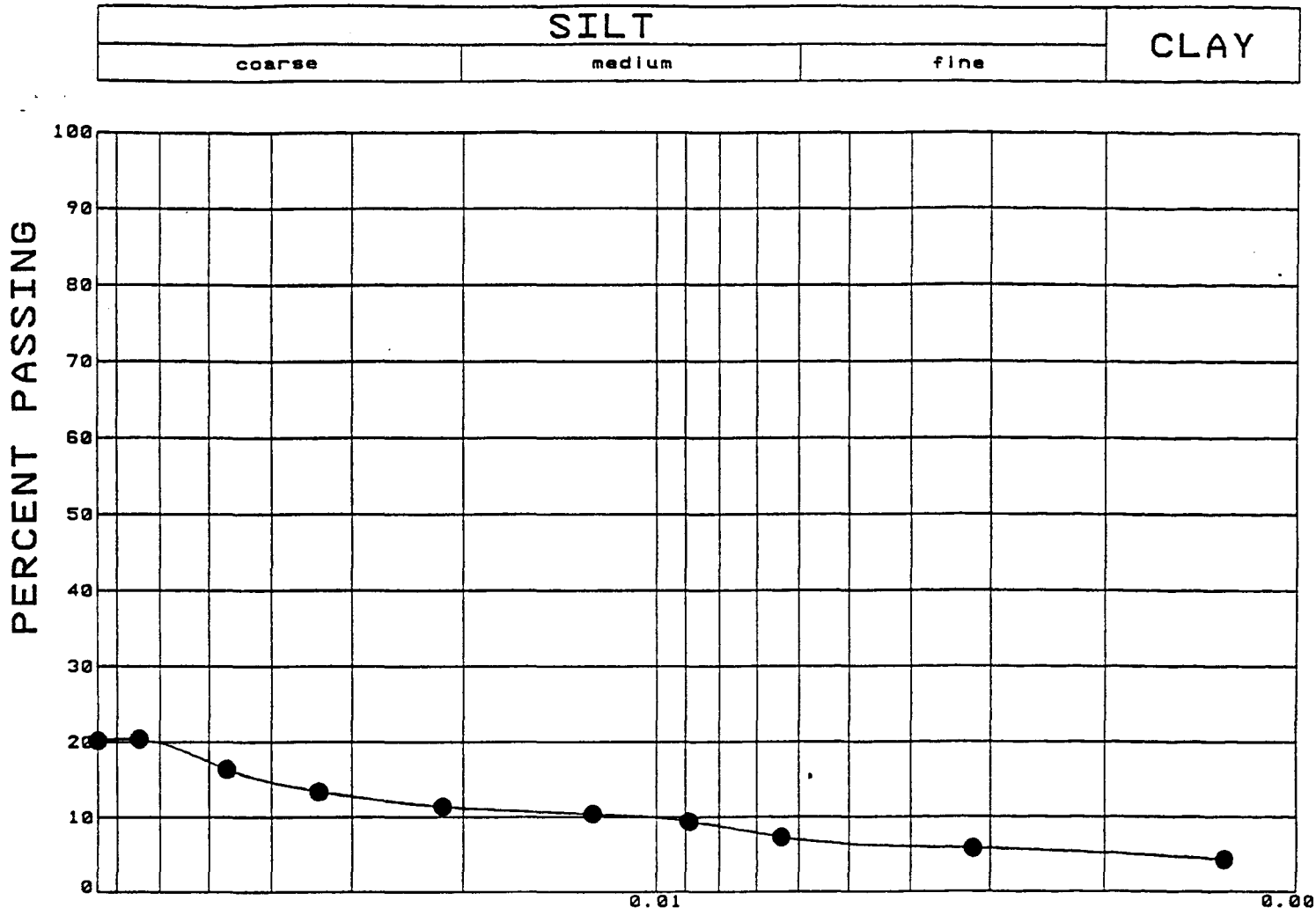
GRAIN SIZE DISTRIBUTION

HXB853

SAMPLE NUMBER	AB-36307 (D1891-04)
PROJECT NUMBER	106
PROJECT	Pensacola Laboratories

LAW ENGINEERING & ENVIRONMENTAL SERVICES, INC.

120007



LEGEND	LOCATION	DEPTH (feet)
●	AB-36307	0.0

(D1891-04)

HXB853

Pensacola Laboratories

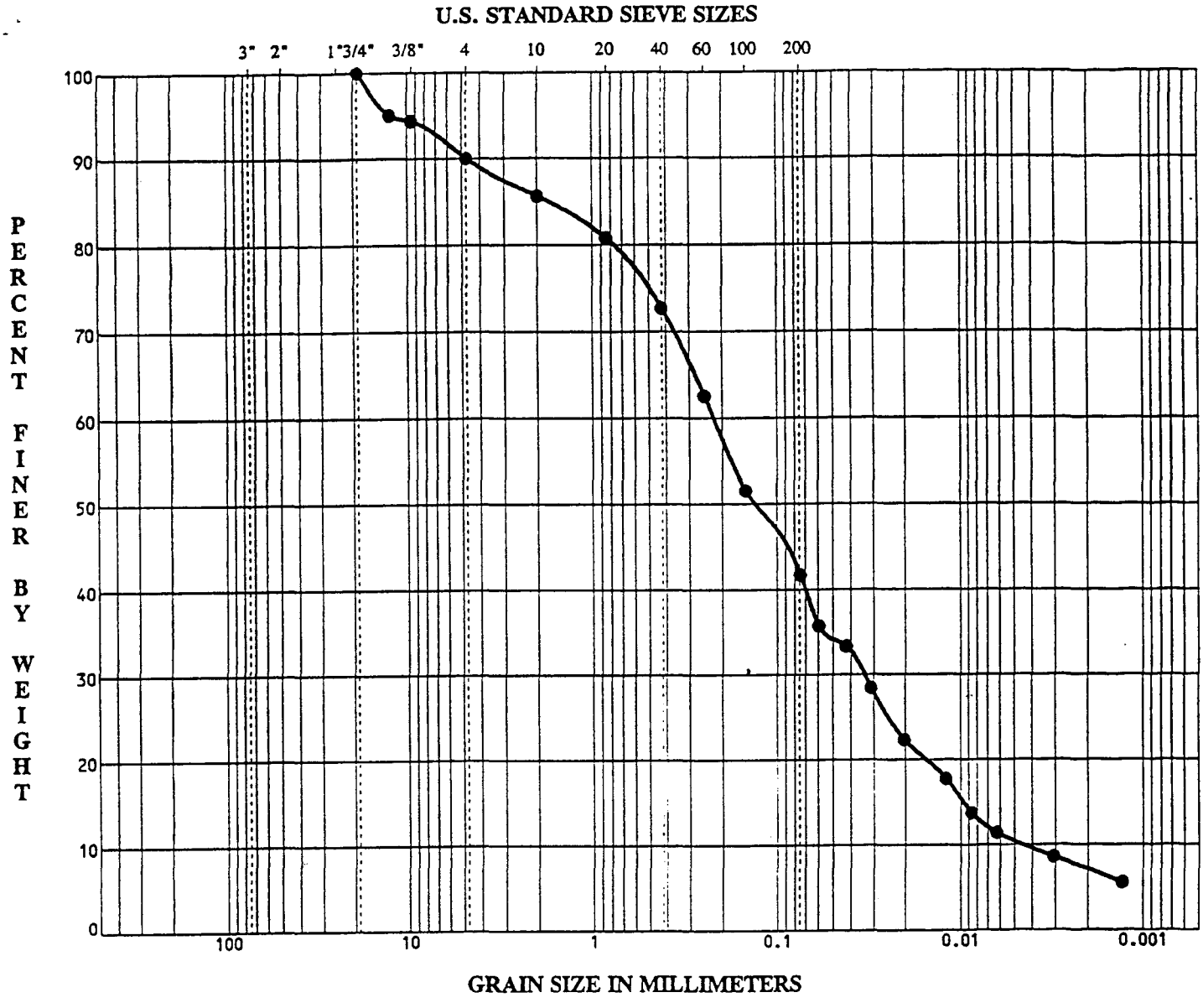
106

HYDROMETER ANALYSIS

Law Engineering Birmingham

120008

Boulders	COBBLES	GRAVEL		SAND			FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt Sizes	Clay Sizes



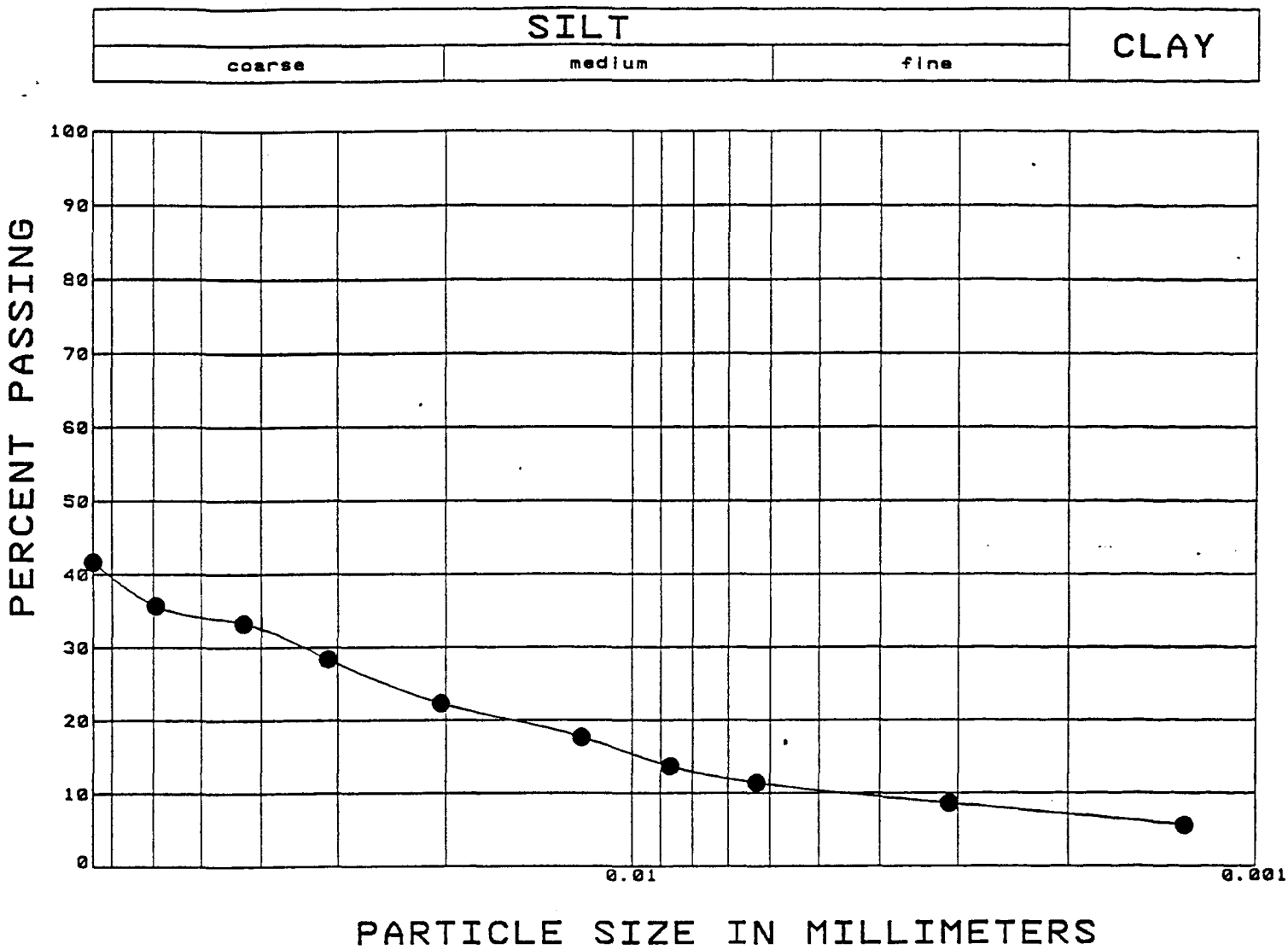
	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION
●	0.0					

GRAIN SIZE DISTRIBUTION

HXBK1

SAMPLE NUMBER	AB-36305	(D1891-02)
PROJECT NUMBER	106	
PROJECT	Pensacola Laboratories	

LAW ENGINEERING & ENVIRONMENTAL SERVICES, INC.



LEGEND	LOCATION	DEPTH (feet)
●	AB-36305	0.0

(D1891-02)

HXBK1

Pensacola Laboratories

106

HYDROMETER ANALYSIS

Law Engineering Birmingham

120006

APPENDIX D

ANALYTICAL DATA

APPENDIX D-1A
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	HX-SS1	HX-SS51	HX-SS2	HX-SS2 MS	HX-SS2 MSD	HX-SS3	HX-SS4	HX-SS5	HXB6S1	HXB6S1MS
Lab Sample ID	D2085-01	D2085-06	D2085-02	D2085-02MS	D2085-02MSD	D2085-03	D2085-04	D2085-05	E0065-01	E0065-01MS
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	SOUTH YARD	NEW PLANT	OLD PLANT	MW6	MW6
Sample Description	ENV. SAMPLE	HX-SS1 DUP.	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS
Date Sampled	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	1/16/98	1/16/98
Aromatics										
Benzene	11 UJ	11 UJ	11 UJ	66	67	58 UJ	71 UJ	11 UJ	11 UJ	60
Toluene	45 J	33 J	11 UJ	68	68	230 J	260 J	35 J	11 UJ	64
Ethylbenzene	1 J	11 UJ	11 UJ	11 U	11 U	41 J	14 J	2 J	2 J	2 J
Xylene(total)	10 J	5 J	11 UJ	11 U	11 U	160 J	150 J	12 J	17 J	19
Styrene	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Halogenated Aliphatics										
Chloromethane	11 UJ	2 J	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Bromomethane	2 JN	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Vinyl Chloride	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Chloroethane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	R	11 U
Methylene Chloride	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
1,1-Dichloroethene	11 UJ	11 UJ	11 UJ	63	63	58 UJ	71 UJ	11 UJ	11 UJ	74
1,1-Dichloroethane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
1,2-Dichloroethene (total)	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Chloroform	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
1,2-Dichloroethane	19 J	17 J	8 J	12	11 J	29 J	44 J	12 J	11 UJ	11 U
1,1,1-Trichloroethane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Carbon Tetrachloride	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Bromodichloromethane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
1,2-Dichloropropane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
cis-1,3-Dichloropropene	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Trichloroethene	2 J	2 J	11 UJ	56	56	6 J	71 UJ	1 J	11 UJ	50
Dibromochloromethane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
1,1,2-Trichloroethane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
trans-1,3-Dichloropropene	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Bromoform	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Tetrachloroethene	4 J	3 J	2 J	2 J	2 J	29 J	71 UJ	4 J	11 UJ	11 U
1,1,2,2-Tetrachloroethane	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Ketones										
Acetone	24 J	42 J	11 UJ	11 U	11 U	11 J	11 J	4 J	15 J	22
2-Butanone	3 J	5 J	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
4-Methyl-2-pentanone	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
2-Hexanone	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Other/Miscellaneous VOCs										
Carbon disulfide	11 UJ	11 UJ	11 UJ	11 U	11 U	58 UJ	71 UJ	11 UJ	11 UJ	11 U
Chlorobenzene	11 UJ	11 UJ	11 UJ	65	66	110 J	71 UJ	11 UJ	11 UJ	53
Total Target VOCs	110 J	109 J	10 J	332	333	616 J	479 J	70 J	34 J	344 J
Number of VOC TICs	0	0	0	0	0	12	0	2	30	
Total VOC TIC Concentration						1400 J		21 J	4529 J	
Percent Solids	89%	90%	88%	88%	88%	86%	88%	91%	91%	91%
Dilution Factor	1	1	1	1	1	1	1	1	1.0	1.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value.

APPENDIX D-1A
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	HXB6S1MSD	HXB10S1	HXB13S1	HXB16S1	HXB16S1MS	HXB16S1MSD	HX-SS6	HX-SS7	HX-SS8	HX-SS9
Lab Sample ID	E0065-01MSD	D1860-01	D2003-02	D2003-01	D2003-01MS	D2003-01MSD	E1640-03	E1640-04	E1640-05	E1640-11
Sample Location	MW6	NEW PLANT	HTHERM1	OFFICE/WARE	OFFICE/WARE	OFFICE/WARE	EAST YARD	EAST YARD	EAST YARD	EAST YARD
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	1/16/98	11/12/97	12/9/97	12/9/97	12/9/97	12/9/97	10/1/98	10/1/98	10/1/98	10/2/98
Aromatics										
Benzene	66	13000 UJ	110 UJ	11 UJ	61	63	10 U	11 U	11 U	11 U
Toluene	73	610000 DJ	110 UJ	2 J	62	65	10 U	11 U	11 U	2 J
Ethylbenzene	2 J	98000 J	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Xylene(total)	22	590000 DJ	110 UJ	0.9 J	11 U	0.7 J	10 U	11 U	11 U	11 U
Styrene	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Halogenated Aliphatics										
Chloromethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Bromomethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Vinyl Chloride	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Chloroethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Methylene Chloride	11 U	13000 UJ	110 UJ	11 UJ	2 JB	4 JB	3 J	4 J	11	5 J
1,1-Dichloroethene	86	13000 UJ	110 UJ	11 UJ	60	60	10 U	11 U	11 U	11 U
1,1-Dichloroethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
1,2-Dichloroethene (total)	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Chloroform	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
1,2-Dichloroethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
1,1,1-Trichloroethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Carbon Tetrachloride	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Bromodichloromethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
1,2-Dichloropropane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
cis-1,3-Dichloropropene	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Trichloroethene	58	2900 J	110 UJ	11 UJ	58	59	10 U	11 U	11 U	11 U
Dibromochloromethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
1,1,2-Trichloroethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
trans-1,3-Dichloropropene	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Bromoform	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Tetrachloroethene	11 U	13000 J	110 UJ	0.6 J	11 U	11 U	2 J	11 U	11 U	5 J
1,1,2,2-Tetrachloroethane	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Ketones										
Acetone	21	6100 J	34 J	20 J	17	19	2 J	11 U	11 U	20
2-Butanone	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	4 J
4-Methyl-2-pentanone	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 UJ	11 U	11 U	11 UJ
2-Hexanone	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Other/Miscellaneous VOCs										
Carbon disulfide	11 U	13000 UJ	110 UJ	11 UJ	11 U	11 U	10 U	11 U	11 U	11 U
Chlorobenzene	61	24000 J	110 UJ	11 UJ	58	59	10 U	11 U	11 U	11 U
Total Target VOCs	389 J	1344000 J	34 J	23.5 J	318 J	329.7 J	7 J	4 J	11	36 J
Number of VOC TICs		6	27	1	0	0	0	0	0	5
Total VOC TIC Concentration		189000 J	12098 J	8 J						62 J
Percent Solids	91%	94%	91%	92%	92%	92%	97%	91%	94%	90%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Level	Low	Medium	Low	Low	Low	Low	Low	Low	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value.

APPENDIX D-1A
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	HX-SS9D	HX-SS10	HX-SS10MS	HX-SS10MSD	HXB18	HXB19	HX-OM1	HX-FBSS1 (1)	HXFB1001(1)	HXBB1001(1)(2)
Lab Sample ID	E1640-12	E1640-13	E1640-13MS	E1640-13MSD	E1640-08	E1640-07	D2085-08	D2085-07	E1640-01	E1640-01
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	HTHERM1			
Sample Description	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK	BOTTLE BLANK
Date Sampled	10/2/98	10/2/98	10/2/98	10/2/98	10/2/98	10/1/98	12/18/97	12/18/97	10/1/98	10/1/98
Aromatics										
Benzene	11 U	11 U	54	55	11 U	11 J	3 J	10 UJ	10 UJ	10 UJ
Toluene	2 J	1 J	57	57	2 J	9 J	51 J	10 UJ	10 UJ	10 UJ
Ethylbenzene	11 U	11 U	11 U	11 U	4 J	14 J	6 J	10 UJ	10 UJ	10 UJ
Xylene(total)	11 U	11 U	11 U	11 U	18	38 J	31 J	10 UJ	10 UJ	10 UJ
Styrene	11 U	11 U	11 U	11 U	11 U	29 UJ	14 JN	10 UJ	10 UJ	10 UJ
Halogenated Aliphatics										
Chloromethane	11 U	11 U	11 U	11 U	11 U	29 U	12 J	10 UJ	10 UJ	10 UJ
Bromomethane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Vinyl Chloride	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Chloroethane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Methylene Chloride	5 J	2 J	11 U	1 J	1 J	32	2 J	2 J	130 J	170 J
1,1-Dichloroethene	11 U	11 U	51	50	11 U	29 U	R	10 UJ	10 UJ	10 UJ
1,1-Dichloroethane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
1,2-Dichloroethene (total)	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Chloroform	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
1,2-Dichloroethane	11 U	11 U	11 U	11 U	11 U	29 U	6 J	10 UJ	10 UJ	10 UJ
1,1,1-Trichloroethane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Carbon Tetrachloride	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Bromodichloromethane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
1,2-Dichloropropane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
cis-1,3-Dichloropropene	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Trichloroethene	11 U	11 U	51	52	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Dibromochloromethane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
1,1,2-Trichloroethane	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
trans-1,3-Dichloropropene	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Bromoform	11 U	11 U	11 U	11 U	11 U	29 U	R	10 UJ	10 UJ	10 UJ
Tetrachloroethene	11 U	37	12	13	9 J	29 UJ	5 J	10 UJ	10 UJ	10 UJ
1,1,2,2-Tetrachloroethane	11 U	11 U	11 U	11 U	11 U	29 UJ	R	10 UJ	10 UJ	10 UJ
Ketones										
Acetone	19	11 U	11 U	11 U	140	210	97 J	3 J	3 JB	11 J
2-Butanone	5 J	11 U	11 U	11 U	21	39	R	10 UJ	10 UJ	5 J
4-Methyl-2-pentanone	11 UJ	11 UJ	11 U	11 U	11 UJ	29 UJ	R	10 UJ	10 UJ	10 UJ
2-Hexanone	11 U	11 U	11 U	11 U	11 U	29 UJ	R	10 UJ	10 UJ	2 J
Other/Miscellaneous VOCs										
Carbon disulfide	11 U	11 U	11 U	11 U	2 J	11 J	R	10 UJ	10 UJ	10 U
Chlorobenzene	11 U	11 U	53	54	11 U	29 UJ	R	10 UJ	10 UJ	10 U
Total Target VOCs	31 J	40 J	278	282 J	197 J	364 J	227 J	5 J	133 J	188 J
Number of VOC TICs	24	2			29	30	3	1	3	0
Total VOC TIC Concentration	352 J	12 J			719 J	4908 J	47 J	12 J	37 J	
Percent Solids	88%	94%	94%	94%	87%	87%	70%	0%	0%	0%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1.0	1.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value.

APPENDIX D-1B
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HX-SS1	HX-SS51	HX-SS2	HX-SS2 MS	HX-SS2 MSD	HX-SS3	HX-SS4	HX-SS5	HXB6S1	HXB6S1MS
Lab Sample ID	D2085-01	D2085-06	D2085-02	D2085-02MS	D2085-02MSD	D2085-03	D2085-04	D2085-05	E0065-01	E0065-01MS
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	SOUTH YARD	NEW PLANT	OLD PLANT	MW6	MW6
Sample Description	ENV. SAMPLE	HX-SS1 DUP.	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS
Date Sampled	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	1/16/98	11/16/97
Phenols/Acid Extractables										
Phenol	R	R	R	1300	1200	390 U	R	R	370 U	1400
2-Chlorophenol	R	R	R	1100	1000	390 U	380 U	370 U	370 U	1400
2-Methylphenol (o-cresol)	R	R	R	390 U	390 U	390 U	380 U	370 U	370 U	370 U
4- Methylphenol	R	R	R	390 U	390 U	390 U	380 U	R	370 U	370 U
2,4-Dimethylphenol	R	R	R	390 U	390 U	390 UJ	380 UJ	370 UJ	370 U	370 U
2,4-Dichlorophenol	R	R	R	390 U	390 U	390 U	380 U	370 U	370 U	370 U
4-Chloro-3-methylphenol	R	R	R	1100	1100	390 U	380 U	370 U	370 U	1600
2,4,6-Trichlorophenol	R	R	R	390 U	390 U	390 U	380 U	370 U	370 U	370 U
2,4,5-Trichlorophenol	R	R	R	970 U	970 U	970 U	960 U	940 U	940 U	940 U
2,4-Dinitrophenol	R	R	R	970 U	970 U	970 U	960 U	940 U	940 U	940 U
2-Nitrophenol	R	R	R	390 U	390 U	390 U	380 U	370 U	370 U	370 U
4-Nitrophenol	R	R	R	2800	2400	970 U	960 U	940 U	940 U	1600
4,6-Dinitro-2-methylphenol	R	R	R	970 U	970 U	970 U	960 U	940 U	940 U	940 U
Pentachlorophenol	R	R	R	970 U	970 U	970 U	960 U	940 U	940 U	510 J
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	370 U	36 J	390 U	390 U	390 U	640	70 J	340 J	370 U	46 J
2-Methylnaphthalene	42 J	59 J	37 J	390 U	390 U	1600	80 J	370 U	89 J	250 J
2-Chloronaphthalene	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
Acenaphthylene	370 U	72 J	24 J	390 U	20 J	390 U	380 U	370 U	23 J	28 J
Acenaphthene	68 J	220 J	390 U	1100	1200	300 JN	380 U	R	35 J	1300
Fluorene	130 J	320 J	24 J	390 U	390 U	660	230 J	370 U	41 J	86 J
Phenanthrene	1300	2100	80 J•	39 J	52 J	1300	490 JN	300 JN	440	650
Anthracene	150 J	260 J	22 JN	390 U	390 U	140 JN	380 U	370 U	120 J	190 J
Fluoranthene	1200	1600	390 U	390 U	390 U	390 U	380 U	370 U	860	800
Pyrene	1800	2800	180 J	1300	1400	390 UJ	R	370 UJ	820	2000
Benzo(a)anthracene	630	850	390 U	390 U	1000	390 UJ	R	370 UJ	490	440
Chrysene	1400 JN	1600 JN	2000 JN	1300	1300	7400 DJN	4400 DJN	4000 DJN	490	480
Benzo(b)fluoranthene	1200 J	1800 J	530 JN	120 J	130 J	1200 J	R	R	700	640
Benzo(k)fluoranthene	560 J	750 J	260 JN	38 J	64 J	460 J	R	R	340 J	290 J
Benzo(a)pyrene	480 J	890 J	80 JN	43 J	49 J	630 J	R	R	440	430
Indeno(1,2,3-cd)pyrene	270 J	390 J	170 J	38 J	44 J	230 J	R	R	260 J	210 J
Dibenz(a,h)anthracene	94 J	130 JN	R	390 U	390 U	R	R	R	88 J	70 J
Benzo(g,h,i)perylene	250 J	360 J	210 J	390 U	390 U	R	R	R	130 J	210 J
Aniline Compounds										
4-Chloroaniline	370 UJ	370 UJ	390 U	390 U	390 U	390 UJ	380 UJ	370 UJ	370 UJ	370 U
2-Nitroaniline	940 U	940 U	970 U	970 U	970 U	970 U	960 U	940 U	940 U	940 U
3-Nitroaniline	940 U	940 U	970 U	970 U	970 U	970 U	960 U	940 U	940 UJ	940 U
4-Nitroaniline	940 U	940 U	970 U	970 U	970 U	970 U	960 U	940 U	940 U	940 U

APPENDIX D-1B
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HX-SS1	HX-SS51	HX-SS2	HX-SS2 MS	HX-SS2 MSD	HX-SS3	HX-SS4	HX-SS5	HXB6S1	HXB6S1MS
Lab Sample ID	D2085-01	D2085-06	D2085-02	D2085-02MS	D2085-02MSD	D2085-03	D2085-04	D2085-05	E0065-01	E0065-01MS
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	SOUTH YARD	NEW PLANT	OLD PLANT	MW6	MW6
Sample Description	ENV. SAMPLE	HX-SS1 DUP.	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS
Date Sampled	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	1/16/98	11/16/97
Benzenes/Aromatics										
1,3-Dichlorobenzene	370 U	370 U	390 U	390 U	390 U	390 U	380 U	320 J	370 U	370 U
1,4-Dichlorobenzene	370 U	370 U	390 U	1100	1100	390 U	380 U	370 U	370 U	870
1,2-Dichlorobenzene	370 U	370 U	390 U	390 U	390 U	740	500	150 J	370 U	370 U
Nitrobenzene	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
1,2,4-Trichlorobenzene	370 U	370 U	390 U	1200	1200	390 U	380 U	370 U	370 U	1100
2,6-Dinitrotoluene	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
2,4-Dinitrotoluene	370 U	370 U	390 U	1200	1200	390 U	380 U	370 U	370 U	1300
Hexachlorobenzene	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
Phthalates										
Dimethylphthalate	370 U	370 U	390 U	390 U	390 U	180 JN	150 J	500	370 U	370 U
Diethylphthalate	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
Di-n-butyl phthalate	370 U	370 U	390 U	390 U	390 U	390 U	2900 JN	2300	370 U	370 U
Butylbenzyl phthalate	47 J	320 J	33 J	390 U	390 U	390 UJ	R	370 UJ	370 U	370 U
bis(2-Ethylhexyl)phthalate	170 JN	200 JN	140 JN	200 J	52 J	630 J	3800 DJN	R	89 J	90 J
Di-n-octyl phthalate	R	20 JN	R	390 U	390 U	R	540 J	R	370 U	370 U
Other/Miscellaneous SVOCs										
bis(2-choroethyl)Ether	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
2,2'-oxybis(1-chloropropane)	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
N-Nitroso-di-n-propylamine	370 U	370 U	390 U	1200	1200	390 U	380 U	370 U	370 U	1000
Hexachloroethane	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
Carbazole	130 JN	240 J	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
Isophorone	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	28 J	96 J
Hexachlorobutadiene	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
bis(2-chloroethoxy)methane	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
Hexachlorocyclopentadiene	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
Dibenzofuran	65 J	180 J	390 U	390 U	390 U	390 U	380 U	370 U	21 J	47 J
4-Chlorophenyl-phenyl ether	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
N-nitrosodiphenylamine	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
4-Bromophenyl-phenyl ether	370 U	370 U	390 U	390 U	390 U	390 U	380 U	370 U	370 U	370 U
3,3'-Dichlorobenzidine	370 U	370 U	390 U	390 U	390 U	390 UJ	R	370 UJ	370 UJ	370 U
Total Target SVOCs	9,986 J	15,197 J	3,790 J	15,178 J	15,711 J	16,110 J	13,160 J	7,910 J	5,504 J	19,133 J
Number of SVOC TICs	9	5	28	0	0	18	26	15	30	
Total SVOC TIC Concentration	139,220 J	4,820 J	40,880 J			11,540 J	27,800 J	8,460 J	8,675 J	
Percent Solids	89%	89%	86%	86%	86%	86%	87%	89%	89%	89%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized *field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.*
3. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample.

APPENDIX D-1B
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HXB6S1MSD	HXB10S1	HXB13S1	HXB16S1	HXB16S1MS	HXB16S1MSD	HX-SS6	HX-SS7	HX-SS8	HX-SS9
Lab Sample ID	E0065-01MSD	D1860-01	D2003-02	D2003-01	D2003-01MS	D2003-01MSD	E1640-03	E1640-04	E1640-05	E1640-11RE
Sample Location	MW6	NEW PLANT	HTHERM1	OFFICE/WARE	OFFICE/WARE	OFFICE/WARE	EAST YARD	EAST YARD	EAST YARD	EAST YARD
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/16/97	11/12/97	12/9/97	12/9/97	12/9/97	12/9/97	10/1/98	10/1/98	10/1/98	10/2/98
Phenols/Acid Extractables										
Phenol	1600	180 JN	4900 U	480 U	1600	1700	1700 U	1100 U	1100 U	370 U
2-Chlorophenol	1600	390 U	4900 U	480 U	1700	1900	1700 U	1100 U	1100 U	370 U
2-Methylphenol (o-cresol)	370 U	1100	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
4- Methylphenol	370 U	1800	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
2,4-Dimethylphenol	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
2,4-Dichlorophenol	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
4-Chloro-3-methylphenol	1800	390 U	4900 U	480 U	1900	2100	1700 U	1100 U	1100 U	370 U
2,4,6-Trichlorophenol	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
2,4,5-Trichlorophenol	940 U	980 U	12000 U	1200 U	1200 U	1200 U	1700 U	1100 U	1100 U	370 UJ
2,4-Dinitrophenol	940 U	980 UJ	12000 U	1200 U	1200 U	1200 U	1700 U	1100 U	1100 U	370 UJ
2-Nitrophenol	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
4-Nitrophenol	1400	980 U	12000 U	1200 UJ	3000	2800	1700 U	1100 U	1100 U	370 UJ
4,6-Dinitro-2-methylphenol	940 U	980 U	12000 UJ	1200 UJ	1200 U	1200 U	1700 U	1100 U	1100 U	370 U
Pentachlorophenol	600 J	980 U	12000 UJ	1200 UJ	950 J	1100 J	1700 UJ	1100 UJ	1100 UJ	370 UJ
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	370 U	460	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
2-Methylnaphthalene	240 J	2000	520 J	480 U	480 U	480 U	1700 U	1100 U	1100 U	41 J
2-Chloronaphthalene	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
Acenaphthylene	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
Acenaphthene	1300	390 U	R	480 U	1300	1400	1700 U	1100 U	1100 U	370 UJ
Fluorene	26 J	120 J	3000 JN	480 U	480 U	58 J	1700 U	1100 U	1100 U	370 UJ
Phenanthrene	190 J	360 J	15000 J	81 J	61 J	560	1700 U	1100 U	1100 U	370 U
Anthracene	53 J	390 U	4900 UJ	480 UJ	480 U	120 J	1700 U	1100 U	1100 U	370 U
Fluoranthene	290 J	160 J	4900 UJ	170 J	110 J	540	1700 U	1100 U	1100 U	370 U
Pyrene	1600	93 J	4900 U	120 J	1400	2000	1700 U	1100 U	1100 U	370 U
Benzo(a)anthracene	170 J	70 J	4900 U	75 J	71 J	280 J	1700 U	1100 U	1100 U	370 U
Chrysene	180 J	130 J	300000 D	130 J	80 J	300 J	1700 U	1100 U	560 J	370 U
Benzo(b)fluoranthene	270 J	100 J	1400 J	110 J	110 J	310 J	1700 U	1100 U	1100 U	39 J
Benzo(k)fluoranthene	110 J	52 J	4900 UJ	480 U	480 U	140 J	1700 U	1100 U	1100 U	370 U
Benzo(a)pyrene	170 J	63 J	3200 J	50 J	49 J	180 J	1700 U	1100 U	1100 U	370 U
Indeno(1,2,3-cd)pyrene	92 J	390 U	4900 UJ	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
Dibenz(a,h)anthracene	370 U	390 U	4900 UJ	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
Benzo(g,h,i)perylene	97 J	390 U	4900 UJ	480 U	480 U	480 U	1700 U	1100 U	1100 U	52 J
Aniline Compounds										
4-Chloroaniline	370 U	390 U	4900 UJ	480 UJ	480 U	480 U	1700 U	1100 U	1100 U	370 U
2-Nitroaniline	940 U	980 U	12000 U	1200 U	1200 U	1200 U	1700 U	1100 U	1100 U	370 UJ
3-Nitroaniline	940 U	980 U	12000 UJ	1200 UJ	1200 U	1200 U	1700 UJ	1100 UJ	1100 UJ	370 UJ
4-Nitroaniline	940 U	980 U	12000 U	1200 U	1200 U	1200 U	1700 U	1100 U	1100 U	370 UJ

APPENDIX D-1B
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HXB6S1MSD	HXB10S1	HXB13S1	HXB16S1	HXB16S1MS	HXB16S1MSD	HX-SS6	HX-SS7	HX-SS8	HX-SS9
Lab Sample ID	E0065-01MSD	D1860-01	D2003-02	D2003-01	D2003-01MS	D2003-01MSD	E1640-03	E1640-04	E1640-05	E1640-11RE
Sample Location	MW6	NEW PLANT	HTHERM1	OFFICE/WARE	OFFICE/WARE	OFFICE/WARE	EAST YARD	EAST YARD	EAST YARD	EAST YARD
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/16/97	11/12/97	12/9/97	12/9/97	12/9/97	12/9/97	10/1/98	10/1/98	10/1/98	10/2/98
Benzenes/Aromatics										
1,3-Dichlorobenzene	370 U	75 J	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
1,4-Dichlorobenzene	1100	390 U	4900 U	480 U	1200	1100	1700 U	1100 U	1100 U	370 U
1,2-Dichlorobenzene	370 U	83 J	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
Nitrobenzene	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
1,2,4-Trichlorobenzene	1200	390 U	4900 U	480 U	1400	1300	1700 U	1100 U	1100 U	370 U
2,6-Dinitrotoluene	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
2,4-Dinitrotoluene	1300	390 U	4900 U	480 U	1400	1300	1700 U	1100 U	1100 U	370 UJ
Hexachlorobenzene	370 U	390 U	4900 UJ	480 UJ	480 U	480 U	1700 U	1100 U	1100 U	370 U
Phthalates										
Dimethylphthalate	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
Diethylphthalate	370 U	5000 D	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
Di-n-butyl phthalate	21 J	390 U	4900 UJ	150 J	85 J	130 J	1700 U	1100 U	1100 U	370 U
Butylbenzyl phthalate	370 U	390 U	4900 U	480 UJ	480 U	480 U	1700 UJ	1100 UJ	1100 UJ	370 UJ
bis(2-Ethylhexyl)phthalate	76 J	810	4900 U	6100 DJ	140 J	140 J	1700 U	1100 U	130 J	370 U
Di-n-octyl phthalate	370 U	390 U	4900 UJ	480 UJ	480 U	480 U	1700 UJ	1100 UJ	1100 UJ	370 UJ
Other/Miscellaneous SVOCs										
bis(2-choroethyl)Ether	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
2,2'-oxybis(1-chloropropane)	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
N-Nitroso-di-n-propylamine	1100	390 U	4900 U	480 U	1200	1100	1700 U	1100 U	1100 U	370 U
Hexachloroethane	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
Carbazole	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
Isophorone	370 U	390 U	4900 UJ	480 UJ	480 U	86 J	1700 U	1100 U	1100 U	370 U
Hexachlorobutadiene	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
bis(2-chloroethoxy)methane	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 U
Hexachlorocyclopentadiene	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
Dibenzofuran	370 U	100 J	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
4-Chlorophenyl-phenyl ether	370 U	390 U	4900 U	480 U	480 U	480 U	1700 U	1100 U	1100 U	370 UJ
N-nitrosodiphenylamine	370 U	390 U	4900 UJ	480 UJ	480 U	480 U	1700 U	1100 U	1100 U	370 U
4-Bromophenyl-phenyl ether	370 U	390 U	4900 UJ	480 UJ	480 U	480 U	1700 U	1100 U	1100 U	370 U
3,3'-Dichlorobenzidine	370 U	390 UJ	4900 UJ	480 UJ	480 U	480 U	1700 UJ	1100 UJ	1100 UJ	370 UJ
Total Target SVOCs	16,585 J	12,756 J	323,120 J	6,986 J	17,756 J	20,644 J	0	0	690 J	132 J
Number of SVOC TICs		28	39	28	0	0	5	19	19	7
Total SVOC TIC Concentration		214,400 J	2,572,600 J	18,800 J	0	0	20,560 J	30,360 J	33,230 J	2,803 J
Percent Solids	89%	85%	91%	92%	92%	92%	95%	91%	93%	89%
Dilution Factor	1.0	1.0	10.0	1.0	1.0	1.0	5	3	3	1
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample.

APPENDIX D-1B
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HX-SS9D	HX-SS10	HX-SS10MS	HX-SS10MSD	HXB18	HXB19	HX-OM1	HX-FBSS1 (1)	HXFB1001 (1)	HXBB1001 (1)(2)
Lab Sample ID	E1640-12	E1640-13	E1640-13MS	E1640-13MSD	E1640-08RE	E1640-07RE	D2085-08	D2085-07	E1640-01	E1640-01
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	HTHERM1			
Sample Description	HX-SS9 DUP	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK	BOTTLE BLANK
Date Sampled	10/2/98	10/2/98	10/2/98	10/2/98	10/2/98	10/1/98	12/18/97	12/18/97	10/1/98	10/1/98
Phenols/Acid Extractables										
Phenol	730 U	350 U	1400	1300	R	730 U	950000 U	10 U	10 U	NA
2-Chlorophenol	730 U	350 U	1400	1300	R	730 U	950000 U	10 U	10 U	NA
2-Methylphenol (o-cresol)	730 U	350 U	350 U	350 U	R	730 U	950000 U	10 U	10 U	NA
4- Methylphenol	730 U	350 U	350 U	350 U	R	730 U	950000 U	10 U	10 U	NA
2,4-Dimethylphenol	730 U	350 U	350 U	350 U	R	730 U	950000 U	10 UJ	10 U	NA
2,4-Dichlorophenol	730 U	350 U	350 U	350 U	R	730 U	950000 U	10 U	10 U	NA
4-Chloro-3-methylphenol	730 U	350 U	2000	1800	R	730 U	950000 U	10 U	10 U	NA
2,4,6-Trichlorophenol	730 U	350 U	350 U	350 U	R	730 U	950000 U	10 U	10 U	NA
2,4,5-Trichlorophenol	730 U	350 U	350 U	350 U	R	730 U	2400000 U	25 U	10 U	NA
2,4-Dinitrophenol	730 U	350 U	350 U	350 U	R	730 U	2400000 U	25 U	10 UJ	NA
2-Nitrophenol	730 U	350 U	350 U	350 U	R	730 U	950000 U	10 U	10 U	NA
4-Nitrophenol	730 U	350 U	2100	1800	R	730 U	2400000 U	25 U	10 U	NA
4,6-Dinitro-2-methylphenol	730 U	350 U	350 U	350 U	R	730 U	2400000 U	25 U	10 U	NA
Pentachlorophenol	730 UJ	350 UJ	860	550	R	730 UJ	2400000 U	25 U	10 U	NA
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	220 J	350 U	350 U	350 U	64 J	490 J	950000 U	10 U	10 U	NA
2-Methylnaphthalene	240 J	350 U	350 U	350 U	190 J	590 J	950000 U	10 U	10 U	NA
2-Chloronaphthalene	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Acenaphthylene	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Acenaphthene	730 U	350 U	1200	1100	350 U	730 U	120000 JN	10 U	10 U	NA
Fluorene	730 U	350 U	350 U	350 U	350 U	85 J	380000 JN	10 U	10 U	NA
Phenanthrene	730 U	350 U	350 U	350 U	120 J	530 J	660000 J	10 U	10 U	NA
Anthracene	730 U	350 U	350 U	350 U	350 U	97 J	950000 U	10 U	10 U	NA
Fluoranthene	730 U	350 U	350 U	350 U	75 J	400 J	950000 U	10 U	10 U	NA
Pyrene	110 J	350 U	1200	1100	240 J	1100 J	950000 U	10 U	10 U	NA
Benzo(a)anthracene	80 J	350 U	350 U	350 U	350 U	280 J	950000 U	10 U	10 U	NA
Chrysene	180 J	130 J	140 J	130 J	110 J	510 J	7200000	10 U	10 U	NA
Benzo(b)fluoranthene	130 J	43 J	350 U	350 U	84 J	520 J	950000 UJ	10 U	10 U	NA
Benzo(k)fluoranthene	730 U	350 U	350 U	350 U	350 U	150 J	950000 UJ	10 U	10 U	NA
Benzo(a)pyrene	74 J	350 U	350 U	350 U	350 U	300 J	R	10 U	10 U	NA
Indeno(1,2,3-cd)pyrene	730 U	350 U	350 U	350 U	50 J	250 J	950000 UJ	10 U	10 U	NA
Dibenz(a,h)anthracene	730 U	350 U	350 U	350 U	350 U	730 U	950000 UJ	10 U	10 U	NA
Benzo(g,h,i)perylene	99 J	350 U	350 U	350 U	78 J	400 J	950000 UJ	10 U	10 U	NA
Aniline Compounds										
4-Chloroaniline	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 UJ	10 U	NA
2-Nitroaniline	730 U	350 U	350 U	350 U	350 U	730 U	2400000 U	25 U	10 U	NA
3-Nitroaniline	730 UJ	350 UJ	350 U	350 U	350 UJ	730 UJ	2400000 U	25 U	10 UJ	NA
4-Nitroaniline	730 U	350 U	350 U	350 U	350 U	730 U	2400000 U	25 U	10 U	NA

APPENDIX D-1B
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HX-SS9D	HX-SS10	HX-SS10MS	HX-SS10MSD	HXB18	HXB19	HX-OM1	HX-FBSS1 [1]	HXFB1001[1]	HXBB1001[1][2]
Lab Sample ID	E1640-12	E1640-13	E1640-13MS	E1640-13MSD	E1640-08RE	E1640-07RE	D2085-08	D2085-07	E1640-01	E1640-01
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	HTHERM1			
Sample Description	HX-SS9 DUP	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK	BOTTLE BLANK
Date Sampled	10/2/98	10/2/98	10/2/98	10/2/98	10/2/98	10/1/98	12/18/97	12/18/97	10/1/98	10/1/98
Benzenes/Aromatics										
1,3-Dichlorobenzene	730 U	350 U	350 U	350 U	350 UJ	730 U	950000 U	10 U	10 U	NA
1,4-Dichlorobenzene	730 U	350 U	980	900	350 UJ	730 U	950000 U	10 U	10 U	NA
1,2-Dichlorobenzene	730 U	350 U	350 U	350 U	350 UJ	730 U	950000 U	10 U	10 U	NA
Nitrobenzene	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
1,2,4-Trichlorobenzene	730 U	350 U	1200	1100	350 U	730 U	950000 U	10 U	10 U	NA
2,6-Dinitrotoluene	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
2,4-Dinitrotoluene	730 U	350 U	1200	1100	350 U	730 U	950000 U	10 U	10 U	NA
Hexachlorobenzene	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Phthalates										
Dimethylphthalate	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Diethylphthalate	730 U	350 U	350 U	350 U	20 J	93 J	950000 U	10 U	10 U	NA
Di-n-butyl phthalate	730 U	350 U	350 U	350 U	350 U	490 J	950000 U	10 U	10 U	NA
Butylbenzyl phthalate	730 UJ	350 UJ	350 U	350 U	100 J	510 J	950000 U	10 U	10 U	NA
bis(2-Ethylhexyl)phthalate	730 U	180 J	200 J	200 J	98 J	2600 J	950000 U	10 U	1 J	NA
Di-n-octyl phthalate	730 UJ	42 J	350 U	350 U	350 UJ	730 UJ	950000 UJ	10 U	10 U	NA
Other/Miscellaneous SVOCs										
bis(2-choroethyl)Ether	730 U	350 U	350 U	25 J	350 UJ	730 U	950000 U	10 U	10 U	NA
2,2'-oxybis(1-chloropropane)	730 U	350 U	350 U	350 U	350 UJ	730 U	950000 U	10 U	10 U	NA
N-Nitroso-di-n-propylamine	730 U	350 U	1300	350 U	350 UJ	730 U	950000 U	10 U	10 U	NA
Hexachloroethane	730 U	350 U	350 U	350 U	350 UJ	730 U	950000 U	10 U	10 U	NA
Carbazole	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Isophorone	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Hexachlorobutadiene	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
bis(2-chloroethoxy)methane	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Hexachlorocyclopentadiene	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
Dibenzofuran	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
4-Chlorophenyl-phenyl ether	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
N-nitrosodiphenylamine	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
4-Bromophenyl-phenyl ether	730 U	350 U	350 U	350 U	350 U	730 U	950000 U	10 U	10 U	NA
3,3'-Dichlorobenzidine	730 UJ	350 UJ	350 U	350 U	350 UJ	730 UJ	950000 U	10 U	10 U	NA
Total Target SVOCs	1,133 J	395 J	15,180 J	12,405	1229 J	9395 J	8,360,000 J	0 J	1 J	
Number of SVOC TICs	15	19			20	19	27	0	2	
Total SVOC TIC Concentration	8,260 J	17,850 J			26,420 J	11,980 J	126,000,000 J		6 J	
Percent Solids	90%	93%	93%	93%	93%	90%	88%	0%	0%	
Dilution Factor	2	1	1	1	1.0	2.0	100	1.0	1.0	
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample.

APPENDIX D-1C
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - PESTICIDES/PCBs (ug/kg)

Field sample ID	HX-SS1	HX-SS51	HX-SS2	HX-SS2 MS	HX-SS2 MSD	HX-SS3	HX-SS4	HX-SS5	HXB6S1	HXB6S1MS
Lab Sample ID	D2085-01	D2085-06	D2085-02	D2085-02MS	D2085-02MSD	D2085-03	D2085-04	D2085-05	E0065-01	E0065-01MS
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	SOUTH YARD	NEW PLANT	OLD PLANT	MW6	MW6
Sample Description	ENV. SAMPLE	HX-SS1 DUP.	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS
Date Sampled	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	1/16/98	11/16/97
Pesticides										
alpha-BHC	1.9 U	1.9 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.9 U	1.9 U	1.9 U
beta-BHC	1.9 U	1.9 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.9 U	1.9 U	1.9 U
delta-BHC	R	1.9 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	R	11	1.9 U
gamma-BHC (Lindane)	1.9 U	1.9 U	2.0 U	14	15	2.0 U	2.0 U	1.9 U	1.9 U	13 P
Heptachlor	6.4 J	2.9 J	2.0 U	12	13 P	2.0 U	R	R	1.9 U	11
Aldrin	8.5 J	4.8 J	67 DJN	43 EP	42 EP	180 DJN	22 JN	1.9 U	3.5 J	14
Heptachlor Epoxide	2.7 JN	1.9 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.9 U	1.9 U	1.9 U
Endosulfan I	1.9 U	1.9 U	2.0 U	2.0 U	2.0 U	2.0 U	R	R	1.9 U	1.9 U
Dieldrin	R	R	3.8 U	25	26	R	3.8 U	R	3.7 U	24 P
4,4'-DDE	R	R	21	16	3.8 U	3.8 U	3.8 U	3.7 U	3.7 U	3.7 U
Endrin	5.6 JN	3.7 U	R	28 P	30 P	R	3.8 U	R	3.7 U	31
Endosulfan II	3.7 U	3.7 U	5.1 JN	3.8 U	3.8 U	3.8 U	3.8 U	R	3.7 U	3.7 U
4,4'-DDD	R	5.1	3.8 U	3.8 U	3.8 U	R	R	R	3.7 U	3.7 U
Endosulfan Sulfate	3.7 U	3.7 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.7 U	3.7 U	3.7 U
4,4'-DDT	R	R	R	48 P	55 P	R	R	R	R	38 P
Methoxychlor	19 UJ	19 UJ	20 UJ	20 U	4.4 JP	20 UJ	20 UJ	19 UJ	19 U	19 U
Endrin ketone	3.7 U	3.7 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	R	3.7 U	3.7 U
Endrin aldehyde	3.7 U	3.7 U	4.0 JN	3.8 U	3.8 U	R	R	3.7 U	R	3.7 U
alpha-Chlordane	R	14 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.9 U	[illegible] U	1.9 U
gamma-Chlordane	29	13 JN	5.2 JN	5.7 P	6.9 P	R	2.0 U	1.9 U	[illegible]	3.0
Toxaphene	190 U	190 U	200 U	200 U	200 U	200 U	200 U	190 U	190 U	190 U
PCBs										
Aroclor-1016	37 U	37 U	38 U	38 U	38 U	38 U	38 U	37 U	37 U	37 U
Aroclor-1221	75 U	75 U	78 U	78 U	78 U	78 U	77 U	75 U	75 U	75 U
Aroclor-1232	37 U	37 U	38 U	38 U	38 U	38 U	38 U	37 U	37 U	37 U
Aroclor-1242	37 U	37 U	38 U	38 U	38 U	38 U	38 U	37 U	37 U	37 U
Aroclor-1248	37 U	37 U	640	590	610	1500	320 J	37 U	37 U	37 U
Aroclor-1254	37 U	37 U	38 U	38 U	38 U	38 U	38 U	37 U	90 JN	170
Aroclor-1260	37 U	37 U	38 U	38 U	38 U	38 U	38 U	37 U	37 U	37 U
Percent Solids	89%	89%	86%	86%	86%	86%	87%	89%	89%	89%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; E = Exceeds instrument calibration range; P = Dual column precision outside limits; NA = Not analyzed.

APPENDIX D-1C
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - PESTICIDES/PCBs (ug/kg)

Field sample ID	HXB6S1MSD	HXB10S1	HXB13S1	HXB16S1	HXB16S1MS	HXB16S1MSD	HX-SS6	HX-SS7	HX-SS8	HX-SS9
Lab Sample ID	E0065-01MSD	D1860-01	D2003-02	D2003-01	D2003-01MS	D2003-01MSD	E1640-03	E1640-04	E1640-05	E1640-11
Sample Location	MW6	NEW PLANT	HTHERM1	OFFICE/WARE	OFFICE/WARE	OFFICE/WARE	EAST YARD	EAST YARD	EAST YARD	EAST YARD
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/16/97	11/12/97	12/9/97	12/9/97	12/9/97	12/9/97	10/1/98	10/1/98	10/1/98	10/2/98
Pesticides										
alpha-BHC	1.9 U	8.0 U	0.50 U	0.49 U	0.49 U	0.49 U	NA	NA	NA	NA
beta-BHC	1.9 U	13 JN	0.50 U	0.49 U	0.49 U	0.49 U	NA	NA	NA	NA
delta-BHC	1.9 U	8.0 U	R	0.49 U	0.49 U	0.49 U	NA	NA	NA	NA
gamma-BHC (Lindane)	11 P	8.0 U	0.50 U	0.49 U	12 E	11 E	NA	NA	NA	NA
Heptachlor	9.5	8.0 U	0.50 U	0.49 U	9.8 E	8.8 E	NA	NA	NA	NA
Aldrin	12	8.0 U	0.50 U	R	11 EP	10 E	NA	NA	NA	NA
Heptachlor Epoxide	1.9 U	8.0 U	0.50 U	0.49 U	0.49 U	0.49 U	NA	NA	NA	NA
Endosulfan I	1.9 U	8.0 U	0.50 U	0.49 U	0.49 U	0.49 U	NA	NA	NA	NA
Dieldrin	20 P	16 U	0.96 U	R	28 EP	28 E	NA	NA	NA	NA
4,4'-DDE	3.7 U	160 JN	R	0.95 U	0.95 U	0.95 U	NA	NA	NA	NA
Endrin	27	96 JN	36 DJ	4.9 JN	37 E	34 E	NA	NA	NA	NA
Endosulfan II	3.7 U	16 U	R	0.95 U	3.4 P	2.4 P	NA	NA	NA	NA
4,4'-DDD	3.7 U	16 U	11 JN	0.95 U	0.95 U	1.6 P	NA	NA	NA	NA
Endosulfan Sulfate	3.7 U	24 JN	0.96 U	0.95 U	0.95 U	0.95 U	NA	NA	NA	NA
4,4'-DDT	32 P	58 JN	0.96 U	R	43 EP	40 EP	NA	NA	NA	NA
Methoxychlor	19 U	80 U	39 J	4.9 U	4.9 U	4.9 U	NA	NA	NA	NA
Endrin ketone	3.7 U	16 U	0.96 U	0.95 U	0.95 U	0.95 U	NA	NA	NA	NA
Endrin aldehyde	3.7 U	24 JN	0.96 U	0.95 U	0.95 U	3.1 P	NA	NA	NA	NA
alpha-Chlordane	1.9 U	71	0.50 U	0.49 U	0.49 U	0.49 U	NA	NA	NA	NA
gamma-Chlordane	2.7 P	71 JN	0.50 U	2.1 J	2.1 P	2.1 P	NA	NA	NA	NA
Toxaphene	190 U	800 U	50 U	49 U	49 U	49 U	NA	NA	NA	NA
PCBs										
Aroclor-1016	37 U	160 U	9.6 U	9.5 U	9.5 U	9.5 U	35 U	36 U	35 U	37 U
Aroclor-1221	75 U	320 U	20 U	19 U	19 U	19 U	70 U	74 U	72 U	75 U
Aroclor-1232	37 U	160 U	9.6 U	9.5 U	9.5 U	9.5 U	35 U	36 U	35 U	37 U
Aroclor-1242	37 U	160 U	9.6 U	9.5 U	9.5 U	9.5 U	35 U	36 U	35 U	37 U
Aroclor-1248	37 U	740	9.6 U	9.5 U	9.5 U	9.5 U	35 U	36 U	35 U	37 U
Aroclor-1254	150	160 U	9.6 U	9.5 U	9.5 U	9.5 U	35 U	36 U	35 U	37 U
Aroclor-1260	37 U	160 U	9.6 U	9.5 U	9.5 U	9.5 U	35 U	R	R	37 U
Percent Solids	89%	85%	91%	92%	92%	92%	95%	91%	93%	89%
Dilution Factor	1.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; E = Exceeds instrument calibration range; P = Dual column precision outside limits; NA = Not analyzed.

APPENDIX D-1C
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - PESTICIDES/PCBs (ug/kg)

Field sample ID	HX-SS9D	HX-SS10	HX-SS10MS	HX-SS10MSD	HXB18	HXB19	HX-OM1	HX-FBSS-1 [1]	HXFB1001[1]	HXBB1001[1][2]
Lab Sample ID	E1640-12	E1640-13	E1640-13MS	E1640-13MSD	E1640-08	E1640-07	D2085-08	D2085-07	E1640-01	E1640-01
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	HTHERM1			
Sample Description	HX-SS9 DUP	ENV. SAMPLE	MS	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK	BOTTLE BLANK
Date Sampled	10/2/98	10/2/98	10/2/98	10/2/98	10/2/98	10/1/98	12/18/97	12/18/97	10/1/98	10/1/98
Pesticides										
alpha-BHC	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
delta-BHC	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
Heptachlor Epoxide	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
Endosulfan Sulfate	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	R	0.10 UJ	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	R	0.50 UJ	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	R	0.10 U	NA	NA
alpha-Chlordane	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
gamma-Chlordane	NA	NA	NA	NA	NA	NA	R	0.050 U	NA	NA
Toxaphene	NA	NA	NA	NA	NA	NA	R	5.0 U	NA	NA
PCBs										
Aroclor-1016	37 U	35 U	230 P	230 P	35 U	37 U	R	1.0 U	1.0 U	NA
Aroclor-1221	74 U	72 U	72 U	72 U	72 U	74 U	R	2.0 U	2.0 U	NA
Aroclor-1232	37 U	35 U	35 U	35 U	35 U	37 U	R	1.0 U	1.0 U	NA
Aroclor-1242	37 U	35 U	35 U	35 U	35 U	1200 J	R	1.0 U	1.0 U	NA
Aroclor-1248	37 U	35 U	35 U	35 U	500 JN	37 U	R	1.0 U	1.0 U	NA
Aroclor-1254	37 U	140 J	220 P	220 P	35 U	37 U	R	1.0 U	1.0 U	NA
Aroclor-1260	37 U	140	320	320	200 JN	R	R	1.0 U	1.0 U	NA
Percent Solids	90%	93%	93%	93%	93%	90%	88%	0%		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; E = Exceeds instrument calibration range; P = Dual column precision outside limits; NA = Not analyzed.

APPENDIX D-1D
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - INORGANICS (mg/kg)

Field sample ID	HX-SS1	HX-SS51	HX-SS2	HX-SS3	HX-SS4	HX-SS5	HXB6S1	HXB10S1	HXB13S1	HXB16S1	HX-SS6
Lab Sample ID	D2085-01	D2085-06	D2085-02	D2085-03	D2085-04	D2085-05	E0065-01	D1860-01	D2003-S1	D2003-01	E1640-03
Sample Location	EAST YARD	EAST YARD	EAST YARD	SOUTH YARD	NEW PLANT	OLD PLANT	MW6	NEW PLANT	HTHERM1	OFFICE/WARE	EAST YARD
Sample Description	ENV. SAMPLE	HX-SS1 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	1/16/98	11/12/97	12/9/97	12/9/97	10/1/98
Aluminum	4190	4870	8010	10400	2500	3420	15200	14600	21700 J	17600 J	10300
Antimony	0.60 UJ	0.63 UJ	0.48 UJ	0.83 J	0.62 UJ	0.54 UJ	0.61 UJ	0.55 U	0.53 UJ	0.51 UJ	0.79 U
Arsenic	4.9	4.1	3.9	9.5	63.8	4.2	3.2	1.3	5.6 J	4.8 J	2.5
Barium	47.0 J	51.6 J	151 J	194 J	812 J	145 J	203	142	367 J	212 J	94.4
Beryllium	0.20 U	0.21 U	0.35	0.42	0.21 U	0.18 U	0.47	0.63	0.62	0.66	0.24
Cadmium	0.22	0.26	1.6	2.1	11.7	1.9	2.5	0.29	0.26	0.5	0.62 J
Calcium	42800 J	48900 J	5700 J	29100 J	18500 J	65500 J	33200 J	2950	6620 J	27800 J	5750
Chromium	14.8 J	24.2 J	55.1 J	133 J	257 J	57.9 J	229 J	123	52.9 J	54.7 J	24.4 J
Cobalt	2.8	3.1	11.0	12.2	28.2	4.9	16.6	15.5	24.7 J	23.6 J	11.2
Copper	14.4 J	18.3 J	57.9 J	95.1 J	1050 J	80.1 J	57.7 J	61.6	53.7 J	75.5 J	49.6 J
Iron	6490	7220	20700	29300	246000	31200	23800	22100	33400 J	25500 J	22800
Lead	32.8 J	53.3 J	144 J	206 J	1040 J	185 J	53.3 J	8.8	54.5	90.3	52.0 J
Magnesium	4760 J	3890 J	3530 J	6860 J	1540 J	13200 J	8770	7380	11800 J	17400 J	5230
Manganese	123 J	131 J	222 J	327 J	1890 J	400 J	319 J	320	421 J	451 J	279
Mercury	0.09 J	0.07 J	0.58 J	7.3 J	6.7 J	3.7 J	1.1 J	0.16	2.3 J	0.33 J	0.10 U
Nickel	11.2	13.1	60.1	97.0	265	28.5	40.9	63.5	37.6 J	85.0 J	14.2 J
Potassium	950	818	2380 J	4420 J	409	234 U	8860	7470 J	13600	10700	4110 J
Selenium	3.5 J	3.8 J	0.87 UJ	3.0 J	0.96 UJ	2.4 J	R	0.91 U	0.89 UJ	0.85 UJ	0.85
Silver	0.40 UJ	0.42 UJ	0.32 UJ	0.41 UJ	0.41 UJ	0.36 UJ	0.40 U	0.36 UJ	0.35 UJ	0.34 UJ	R
Sodium	184	190	154	282	350	228	66.6	320	112	229	711
Thallium	0.41	0.58	0.55	0.79	2.8	0.73	4.0	0.38	1.3	1.6	2.2
Vanadium	21.2	18.8	28.3	34.9	19.0	16.4	50.4	42.0	69.0	58.8	64.9 J
Zinc	64.8	83.4	545	482	1270	327	166 J	87.7 J	162 J	225 J	269 J
Cyanide	R	R	R	R	R	R	0.83 U	0.87 U	1.0 U	1.1 U	0.05 U
Percent Solids	89%	82%	86%	86%	87%	89%	89%	85%	91%	92%	93%
Level	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value.

APPENDIX D-1D
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA - INORGANICS (mg/kg)

Field sample ID	HX-SS7	HX-SS8	HX-SS9	HX-SS9D	HX-SS10	HXB18	HXB19	HX-OM1	HX-FBSS1 [1]	HXFB1001[1]	HXBB1001[1][2]
Lab Sample ID	E1640-04	E1640-05	E1640-11	E1640-12	E1640-13	E1640-08	E1640-07	D2085-08	D2085-07	E1640-01	E1640-01
Sample Location	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	EAST YARD	HTHERM1			
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HX-SS9 DUP	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK	BOTTLE BLANK
Date Sampled	10/1/98	10/1/98	10/2/98	10/2/98	10/2/98	10/2/98	10/1/98	12/18/97	12/18/97	10/1/98	10/1/98
Aluminum	7360	7830	10400	10700	12200	7230	10600	1560	22.4	21.0 U	NA
Antimony	1.0 U	11.8 J	3.4 J	4.0 J	2.5 J	0.83 U	24.3 J	9.5 J	3.0 U	5.0 U	NA
Arsenic	3.2	6.5 J	5.7 J	5.5 J	3.9	5.1 J	27.5 J	7.0	2.0 U	2.0 U	NA
Barium	84.5	646	588	427	114	123	1840	115 J	43.2 J	1.0 U	NA
Beryllium	0.19	0.20	0.35	0.34	0.14	0.27	0.22	0.18 U	1.0 U	0.20 U	NA
Cadmium	0.90 J	7.7 J	7.2 J	8.1 J	0.79 J	1.1 J	31.5 J	6.5	0.60 U	0.50 U	NA
Calcium	11700	19000	19500	18300	7920	76700	32100	23400 J	50.6	32.1	NA
Chromium	18.9 J	37.2 J	54.5 J	57.9 J	9.8 J	33.3 J	123 J	318 J	0.50 U	0.82	NA
Cobalt	9.7	11.7	10.9	10.0	13.7	13.3	14.0	43.2	1.4	0.50 U	NA
Copper	73.4 J	266 J	380 J	329 J	75.1 J	65.4 J	3720 J	293 J	5.8	2.0 U	NA
Iron	17300	24600	31800	31200	23500	15400	42000	69300	784	13.9	NA
Lead	111 J	856 J	928 J	911 J	286 J	99.9 J	1400 J	1190 J	2.7	3.0 U	NA
Magnesium	3660	8330	5810	5460	4370	10500	5610	15200 J	9.0 U	6.3	NA
Manganese	867	713	219	220	750	223	452	528 J	6.8	0.50 U	NA
Mercury	0.10 U	0.56	0.21	0.14	0.10 U	0.17	1.1	0.43 J	0.09 U	0.27 U	NA
Nickel	101 J	115 J	217 J	150 J	19.5 J	0.10 U	140 J	110	3.0 U	0.60 U	NA
Potassium	2450 J	1350 J	4800 J	5150 J	464 J	3580 J	2610 J	234 U	1300 U	3.5	NA
Selenium	1.0 U	0.96 U	1.3	1.9	0.96 U	0.83 U	8.6	1.1 UJ	5.0 UJ	5.0 U	NA
Silver	R	R	R	R	R	R	R	1.5 J	2.0 U	2.0 U	NA
Sodium	567	4260	9000	8950	1410	545	20900	1690	300 U	449	NA
Thallium	0.84 U	0.77 U	2.7	2.6	0.77 U	0.66 U	0.73 U	0.83	2.0 U	4.0 U	NA
Vanadium	39.1 J	74.0 J	31.0 J	31.3 J	85.9 J	28.7 J	64.5 J	18.3	1.0 U	1.0 U	NA
Zinc	296 J	3020 J	6890 J	6590 J	381 J	265 J	8100 J	1090	6.5	1.0 U	NA
Cyanide	0.05 U	1.8 J	0.13 J	0.39 J	0.05 U	0.05 U	3.2 J	R	200 U	1.9	NA
Percent Solids	92%	95%	89%	90%	95%	95%	90%	88%	0%	0%	
Level	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low	

Notes:

1. Field blank concentration reported in ug/L.
2. An odor was detected in the cooler containing bottles shipped from the laboratory (Mitkem). The bottle blank data represent deionized field blank water (provided by laboratory) poured directly into a soil collection jar in the field prior to sampling activities.
3. U = Not detected; J = Estimated value; R = Rejected value.

APPENDIX D-1E
HEXAGON LABORATORIES RI/FFS
SURFACE SOIL ANALYTICAL DATA TOTAL ORGANIC CARBON TOTAL PETROLEUM HYDROCARBONS (mg/kg)

Field sample ID	HX-SS1	HX-SS51	HX-SS2	HX-SS3	HX-SS4	HX-SS5	HXB6S1	HXB10S1	HXB13S1	HX-SS9	HX-OM1	HX-FBSS1
Lab Sample ID	D2085-01	D2085-06	D2085-02	D2085-03	D2085-04	D2085-05	E0065-01	D1860-01	D2003-02	E1640-11	D2085-08	D2085-07
Sample Location	EAST YARD	EAST YARD	EAST YARD	SOUTH YARD	NEW PLANT	OLD PLANT	MW6	NEW PLANT	HTHERM1	EAST YARD	HTHERM1	
Sample Description	ENV. SAMPLE	HX-SS1 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK
Date Sampled	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	1/16/98	11/12/97	12/9/97	10/2/98	12/18/97	12/18/97
TOC [1]	22400	14700	6630	21800	50800	25900	5360	3260	NA	13400	647000	ND
TPHC	NA	NA	330	1500	NA	NA	NA	NA	28000	NA	280000	NA

Notes:
1. Concentration of TOC in field blank (HX-FBSS1) reported in mg/L.
2. ND = Not detected; NA = Not analyzed.

APPENDIX D-2A
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	HXB1S3	HXB1S7	HXB3S2	HXB4S2	HXB54	HXB5S2	HXB7S2	HXB7S4	HXB8S4	HXB9S3	HXB9S5
Lab Sample ID	D1911-06	D1911-07	D1848-05	D1905-01	D1905-02	D1875-01	D1848-01	D1848-02	D1891-05	D1848-03	D1848-04
Sample Location	MW1	MW1	MW3	MW4	MW4	MW5	EAST YARD	EAST YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXB4S2 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/19/97	11/19/97	11/11/97	11/18/97	11/18/97	11/14/97	11/11/97	11/11/97	11/17/97	11/11/97	11/11/97
Aromatics											
Benzene	2 J	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	1 J	11 UJ	30 J	1400 UJ
Toluene	130	11 U	88 J	3200000 D	4200000 D	340000 D	360 J	78 J	11 UJ	75 J	1400 UJ
Ethylbenzene	3 J	11 U	11 J	490000	580000	47000	390 J	2 J	41 J	650 J	2200 J
Xylene(total)	22	11 U	99 J	3300000	3900000	220000	2400 J	12 J	240 J	880 J	3000 J
Styrene	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Halogenated Aliphatics											
Chloromethane	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Bromomethane	12 UJ	11 UJ	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Vinyl Chloride	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Chloroethane	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Methylene Chloride	0.8 J	6 J	1 J	140000 U	140000 U	5600 U	110 UJ	1 J	11 UJ	120 UJ	570 J
1,1-Dichloroethene	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
1,1-Dichloroethane	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
1,2-Dichloroethene (total)	12 U	11 U	11 J	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Chloroform	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
1,2-Dichloroethane	34	24	30 J	68000 J	80000 J	5600 U	65 J	34 J	11 UJ	36 J	1400 UJ
1,1,1-Trichloroethane	12 U	11 U	11 UJ	15000 J	140000 U	5600 U	110 UJ	1 J	11 UJ	120 UJ	1400 UJ
Carbon Tetrachloride	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Bromodichloromethane	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
1,2-Dichloropropane	12 U	11 U	11 UJ	140000 J	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
cis-1,3-Dichloropropene	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Trichloroethene	4 J	0.9 J	19 J	150000	190000	410 J	12 J	9 J	11 UJ	120 UJ	1400 UJ
Dibromochloromethane	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
1,1,2-Trichloroethane	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
trans-1,3-Dichloropropene	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Bromoform	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Tetrachloroethene	6 J	11 U	51 J	1100000	1500000	5600 U	110 UJ	5 J	11 UJ	120 UJ	1400 UJ
1,1,2,2-Tetrachloroethane	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Ketones											
Acetone	12 J	30	38 J	140000 U	140000 U	4700 J	200 J	30 J	11 UJ	250 J	1400 UJ
2-Butanone	4 J	3 J	30 J	140000 U	140000 U	5600 U	110 UJ	5 J	11 UJ	120 UJ	1400 UJ
4-Methyl-2-pentanone	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
2-Hexanone	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Other/Miscellaneous VOCs											
Carbon disulfide	12 U	11 U	11 UJ	140000 U	140000 U	5600 U	110 UJ	11 UJ	11 UJ	120 UJ	1400 UJ
Chlorobenzene	12 U	3 J	11 UJ	140000 U	140000 U	5600 U	12 J	2 J	25 J	34 J	400 J
TOTAL TARGET VOCs	218 J	67 J	378 J	8463000 J	10450000 J	612110 J	3439 J	180 J	306 J	1955 J	6170 J
Number of VOA TICs	2	2	2	1	3	4	30	0	30	30	30
Total VOA TIC Concentration	*24 J*	*44 J*	*43 J*	*83000 J*	*270000 J*	*29000 J*	*13270 J*		*1568 J*	*71500 J*	*266300 J*
Percent Solids	83%	89%	90%	88%	88%	89%	88%	87%	93%	86%	89%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Level	Low	Low	Low	Medium	Medium	Medium	Low	Low	Low	Low	Medium

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample.

APPENDIX D-2A
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	HXB11S2	HXB12S2	HXB15S1	HXB17	HXB20	HXB21	HXBK1	HXBK2	HXBK3	HXFBA1 [1]	FBB-1 [1]
Lab Sample ID	D1860-03	D1860-02	D1911-05	E1640-06	E1640-09	E1640-10	D1891-02	D1891-03	D1891-01	E0065-02	D1891-06
Sample Location	OLD PLANT	OLD PLANT	NORTH YARD	EAST YARD	EAST YARD	EAST YARD	TUFO'S	HOLLERS AVE.	PEARTREE AVE.		
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	BACKGROUND	BACKGROUND	BACKGROUND	FIELD BLANK	FIELD BLANK
Date Sampled	11/12/97	11/12/97	11/19/97	10/1/98	10/2/98	10/2/98	11/17/97	11/17/97	11/17/97	1/16/98	11/17/97
Aromatics											
Benzene	28000 JN	6900 UJ	0.6 J	330	2 J	22	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Toluene	21000000 DJ	150000 DJ	28	10 J	4 J	54	9 J	11 UJ	11 UJ	10 UJ	10 U
Ethylbenzene	770000 J	7700 J	0.9 J	380	2 J	26	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Xylene(total)	3400000 DJ	48000 J	6 J	130	6 J	200	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Styrene	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Halogenated Aliphatics											
Chloromethane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Bromomethane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Vinyl Chloride	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Chloroethane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Methylene Chloride	26000 J	6900 UJ	0.6 J	12 J	2 J	2 J	12 UJ	11 UJ	11 UJ	10 UJ	10 U
1,1-Dichloroethene	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
1,1-Dichloroethane	27000 J	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
1,2-Dichloroethene (total)	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Chloroform	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
1,2-Dichloroethane	5100000 DJN	6900 UJ	36	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
1,1,1-Trichloroethane	570000 J	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Carbon Tetrachloride	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Bromodichloromethane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
1,2-Dichloropropane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
cis-1,3-Dichloropropene	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Trichloroethene	880000 J	840 J	0.9 J	56 U	12 U	12 U	9 J	11 UJ	11 UJ	10 UJ	10 U
Dibromochloromethane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
1,1,2-Trichloroethane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
trans-1,3-Dichloropropene	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Bromoform	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Tetrachloroethene	310000 J	5100 J	1 J	56 U	18	12 J	2 J	11 UJ	11 UJ	10 UJ	10 U
1,1,2,2-Tetrachloroethane	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Ketones											
Acetone	69000 UJ	6900 UJ	4 J	240	36	140	89 J	2 J	4 J	10 UJ	10 U
2-Butanone	69000 UJ	6900 UJ	10 U	61	5 J	24	21 J	11 UJ	11 UJ	10 UJ	10 UJ
4-Methyl-2-pentanone	69000 UJ	6900 UJ	10 U	56 UJ	12 UJ	12 UJ	12 UJ	11 UJ	11 UJ	10 UJ	10 U
2-Hexanone	69000 UJ	6900 UJ	10 U	56 U	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 UJ
Other/Miscellaneous VOCs											
Carbon disulfide	69000 UJ	6900 UJ	10 U	56 U	2 J	5 J	12 UJ	11 UJ	11 UJ	10 UJ	10 U
Chlorobenzene	200000 J	2900 J	10 U	84	12 U	12 U	12 UJ	11 UJ	11 UJ	10 UJ	10 U
TOTAL TARGET VOCs	32311000 J	214540 J	78 J	1247 J	77 J	485 J	130 J	2 J	4 J	0	0 J
Number of VOA TICs	6	8	2	30	30	30	30	0	0	0	0
Total VOA TIC Concentration	919000 J	73600 J	21 J	11590 J	461 J	2947 J	4169 J				
Percent Solids	90%	90%	95%	89%	83%	82%	85%	88%	89%	100%	0%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Level	Medium	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample.

APPENDIX D-2B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HXB1S3	HXB1S7	HXB3S2	HXB4S2	HXB54	HXB5S2	HXB7S2	HXB7S4	HXB8S4	HXB9S3	HXB9S5
Lab Sample ID	D1911-06	D1911-07	D1848-05	D1905-01	D1905-02	D1875-01	D1848-01	D1848-02	D1891-05	D1848-03	D1848-04
Sample Location	MW1	MW1	MW3	MW4	MW4	MW5	EAST YARD	EAST YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXB4S2 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/19/97	11/19/97	11/11/97	11/18/97	11/18/97	11/14/97	11/11/97	11/11/97	11/17/97	11/11/97	11/11/97
Phenols/Acid Extractables											
Phenol	550 UJ	530 UJ	R	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
2-Chlorophenol	550 UJ	530 UJ	R	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
2-Methylphenol (o-cresol)	550 UJ	530 UJ	R	1500 UJ	1500 UJ	820	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
4- Methylphenol	550 UJ	530 UJ	R	1400 J	1100 J	480	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
2,4-Dimethylphenol	550 UJ	530 UJ	R	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
2,4-Dichlorophenol	550 UJ	530 UJ	R	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
4-Chloro-3-methylphenol	550 UJ	530 UJ	R	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
2,4,6-Trichlorophenol	550 UJ	530 UJ	R	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
2,4,5-Trichlorophenol	1400 UJ	1300 UJ	R	3700 UJ	3700 UJ	940 U	1800 UJ	960 U	3700 UJ	1900 UJ	1800 UJ
2,4-Dinitrophenol	1400 UJ	1300 UJ	R	3700 UJ	3700 UJ	940 UJ	1800 UJ	960 U	3700 UJ	1900 UJ	1800 UJ
2-Nitrophenol	550 UJ	530 UJ	R	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 UJ	720 UJ
4-Nitrophenol	1400 UJ	1300 UJ	R	3700 UJ	3700 UJ	940 U	1800 UJ	960 U	3700 UJ	1900 UJ	1800 UJ
4,6-Dinitro-2-methylphenol	1400 UJ	1300 UJ	R	3700 UJ	3700 UJ	940 U	1800 UJ	960 U	3700 UJ	1900 UJ	1800 UJ
Pentachlorophenol	1400 UJ	1300 UJ	R	3700 UJ	3700 UJ	940 U	1800 UJ	960 U	3700 UJ	1900 UJ	1800 UJ
Polycyclic Aromatic Hydrocarbons (PAHs)											
Naphthalene	56 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	600 J	380 U	600 J	1800	4000
2-Methylnaphthalene	56 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	840	380 U	2400 J	12000 D	15000 D
2-Chloronaphthalene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Acenaphthylene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Acenaphthene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	300 J	1100	970
Fluorene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	51 J	380 U	280 J	1600	1400
Phenanthrene	360 J	530 UJ	380 U	1500 UJ	1500 UJ	70 J	310 J	380 U	480 J	3300	3300
Anthracene	68 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Fluoranthene	480 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	230 J	380 U	1500 UJ	200 J	160 J
Pyrene	460 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	510 J	380 U	1500 UJ	510 J	500 J
Benzo(a)anthracene	230 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	140 JN	380 U	1500 UJ	750 U	64 J
Chrysene	290 J	530 UJ	380 U	1500 UJ	1500 UJ	60 J	250 J	380 U	1500 UJ	150 J	720 U
Benzo(b)fluoranthene	340 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	260 JN	380 U	1500 UJ	750 U	720 U
Benzo(k)fluoranthene	120 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	80 JN	380 U	1500 UJ	750 U	720 U
Benzo(a)pyrene	190 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	210 J	380 U	1500 UJ	750 U	720 U
Indeno(1,2,3-cd)pyrene	75 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	83 J	380 U	1500 UJ	750 U	720 U
Dibenz(a,h)anthracene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 U	720 U
Benzo(g,h,i)perylene	81 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 U	720 U
Aniline Compounds											
4-Chloroaniline	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
2-Nitroaniline	1400 UJ	1300 UJ	950 U	3700 UJ	3700 UJ	940 U	1800 U	960 U	3700 UJ	1900 U	1800 U
3-Nitroaniline	1400 UJ	1300 UJ	950 U	3700 UJ	3700 UJ	940 U	1800 U	960 U	3700 UJ	1900 U	1800 U
4-Nitroaniline	1400 UJ	1300 UJ	950 U	3700 UJ	3700 UJ	940 U	1800 U	960 U	3700 UJ	1900 U	1800 U

APPENDIX D-2B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HXB1S3	HXB1S7	HXB3S2	HXB4S2	HXB54	HXB5S2	HXB7S2	HXB7S4	HXB8S4	HXB9S3	HXB9S5
Lab Sample ID	D1911-06	D1911-07	D1848-05	D1905-01	D1905-02	D1875-01	D1848-01	D1848-02	D1891-05	D1848-03	D1848-04
Sample Location	MW1	MW1	MW3	MW4	MW4	MW5	EAST YARD	EAST YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXB4S2 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/19/97	11/19/97	11/11/97	11/18/97	11/18/97	11/14/97	11/11/97	11/11/97	11/17/97	11/11/97	11/11/97
Benzenes/Aromatics											
1,3-Dichlorobenzene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
1,4-Dichlorobenzene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
1,2-Dichlorobenzene	550 UJ	530 UJ	380 U	9400 J	2500 J	180 J	740 U	380 U	1500 UJ	750 U	720 U
Nitrobenzene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
1,2,4-Trichlorobenzene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
2,6-Dinitrotoluene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
2,4-Dinitrotoluene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Hexachlorobenzene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Phthalates											
Dimethylphthalate	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Diethylphthalate	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	53 J	740 U	380 U	1500 UJ	750 U	720 U
Di-n-butyl phthalate	120 J	530 UJ	380 U	1500 UJ	1500 UJ	230 J	97 J	380 U	1500 UJ	750 U	720 U
Butylbenzyl phthalate	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
bis(2-Ethylhexyl)phthalate	260 J	64 J	73 J	1500 UJ	1500 UJ	1300	750	380 U	1500 UJ	790	720 U
Di-n-octyl phthalate	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 UJ	380 U	1500 UJ	750 U	720 U
Other/Miscellaneous SVOCs											
bis(2-choroethyl)Ether	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
2,2'-oxybis(1-chloropropane)	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
N-Nitroso-di-n-propylamine	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Hexachloroethane	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Isophorone	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Carbazole	60 J	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Hexachlorobutadiene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
bis(2-chloroethoxy)methane	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Hexachlorocyclopentadiene	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
Dibenzofuran	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	190 J	680 J	620 J
4-Chlorophenyl-phenyl ether	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
N-nitrosodiphenylamine	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
4-Bromophenyl-phenyl ether	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 U	740 U	380 U	1500 UJ	750 U	720 U
3,3'-Dichlorobenzidine	550 UJ	530 UJ	380 U	1500 UJ	1500 UJ	370 UJ	740 U	380 U	1500 UJ	750 U	720 U
Total Target SVOCs	3,246 J	64 J	73 J	10,800 J	3,600 J	3,193 J	4,411 J	0 J	4,250 J	22,130 J	26,014 J
Number of SVOA TICs	25	4	18	28	29	34	4	0	37	37	37
Total SVOA TIC Concentration	42,650 J	2,030 J	3,319 J	1,018,800 J	2,096,600 J	62,390 J	8,300 J		51,690 J	125,400 J	134,200 J
Percent Solids	81%	84%	88%	90%	90%	89%	90%	87%	90%	89%	93%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	2.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; NA = Not analyzed.

APPENDIX D-2B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HXB11S2	HXB12S2	HXB15S1	HXB17	HXB20	HXB21	HXBK1	HXBK2	HXBK3	HXFBA1 [1]	FBB-1 [1]
Lab Sample ID	D1860-03	D1860-02	D1911-05	E1640-06	E1640-09	E1640-10	D1891-02	D1891-03	D1891-01	E0065-02	D1891-06
Sample Location	OLD PLANT	OLD PLANT	NORTH YARD	EAST YARD	EAST YARD	EAST YARD	TUFO'S	HOLLERS AVE.	PEARTREE AVE.		
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	BACKGROUND	BACKGROUND	BACKGROUND	FIELD BLANK	FIELD BLANK
Date Sampled	11/12/97	11/12/97	11/19/97	10/1/98	10/2/98	10/2/98	11/17/97	11/17/97	11/17/97	1/16/98	11/17/97
Phenols/Acid Extractables											
Phenol	5100 DJN	360 JN	490 UJ	1100 U	760 U	160 J	R	1500 UJ	1400 UJ	10 U	10 U
2-Chlorophenol	1800 U	370 U	490 UJ	1100 U	760 U	780 U	R	1500 UJ	1400 UJ	10 U	10 U
2-Methylphenol (o-cresol)	4600 DJN	55 JN	490 UJ	1100 U	760 U	140 J	R	1500 UJ	1400 UJ	10 UJ	10 U
4- Methylphenol	1000 DJ	350 J	490 UJ	1100 U	760 U	800	R	1500 UJ	1400 UJ	10 U	10 U
2,4-Dimethylphenol	1800 U	370 U	490 UJ	1100 U	760 U	780 U	R	1500 UJ	1400 UJ	10 U	10 U
2,4-Dichlorophenol	1800 U	370 U	490 UJ	1100 U	760 U	780 U	R	1500 UJ	1400 UJ	10 U	10 U
4-Chloro-3-methylphenol	1800 U	370 U	490 UJ	1100 U	760 U	780 U	R	1500 UJ	1400 UJ	10 U	10 U
2,4,6-Trichlorophenol	1800 U	370 U	490 UJ	1100 U	760 U	780 U	R	1500 UJ	1400 UJ	10 U	10 U
2,4,5-Trichlorophenol	4600 U	920 U	1200 UJ	1100 U	760 U	780 U	R	3700 UJ	3600 UJ	25 U	25 U
2,4-Dinitrophenol	4600 UJ	920 UJ	1200 UJ	1100 U	760 U	780 U	R	3700 UJ	3600 UJ	25 U	25 U
2-Nitrophenol	1800 U	370 U	490 UJ	1100 U	760 U	780 U	R	1500 UJ	1400 UJ	10 U	10 U
4-Nitrophenol	4600 U	920 U	1200 UJ	1100 U	760 U	780 U	R	3700 UJ	3600 UJ	25 U	25 U
4,6-Dinitro-2-methylphenol	4600 U	920 UJ	1200 UJ	1100 U	760 U	780 U	R	3700 UJ	3600 UJ	25 U	25 U
Pentachlorophenol	4600 U	920 UJ	1200 UJ	1100 UJ	760 UJ	780 UJ	R	3700 UJ	3600 UJ	25 U	25 U
Polycyclic Aromatic Hydrocarbons (PAHs)											
Naphthalene	14000 DJN	370 U	490 UJ	760 J	270 J	1200	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
2-Methylnaphthalene	1800 U	370 U	490 UJ	1100	300 J	1600	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
2-Chloronaphthalene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Acenaphthylene	1800 U	370 U	490 UJ	1100 U	760 U	120 J	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Acenaphthene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	960 J	1500 UJ	1400 UJ	10 U	10 U
Fluorene	1800 U	370 U	490 UJ	1100 U	83 J	140 J	1100 J	1500 UJ	1400 UJ	10 U	10 U
Phenanthrene	1800 U	360 JN	490 UJ	430 J	550 J	1000	12000 J	1500 UJ	1400 UJ	10 U	10 U
Anthracene	1800 U	370 UJ	490 UJ	1100 U	120 J	270 J	1200 J	1500 UJ	1400 UJ	10 U	10 U
Fluoranthene	1800 U	400 J	490 UJ	430 J	730 J	970	9600 J	1500 UJ	160 J	10 U	10 U
Pyrene	1800 U	130 J	490 UJ	1000 J	1300	2100	14000 DJ	1500 UJ	190 J	10 U	10 U
Benzo(a)anthracene	1800 U	88 JN	490 UJ	220 J	440 J	690 J	4900 J	1500 UJ	1400 UJ	10 U	10 U
Chrysene	1800 U	190 J	490 UJ	460 J	760	1200	6600 J	1500 UJ	1400 UJ	10 U	10 U
Benzo(b)fluoranthene	1800 U	170 J	490 UJ	410 J	600 J	1100	3900 J	1500 UJ	160 J	10 U	10 U
Benzo(k)fluoranthene	1800 U	62 J	490 UJ	120 J	260 J	360 J	1800 J	1500 UJ	1400 UJ	10 U	10 U
Benzo(a)pyrene	1800 U	120 JN	490 UJ	210 J	340 J	720 J	1500 J	1500 UJ	1400 UJ	10 U	10 U
Indeno(1,2,3-cd)pyrene	1800 U	370 U	490 UJ	190 J	300 J	590 J	1000 J	1500 UJ	1400 UJ	10 U	10 U
Dibenz(a,h)anthracene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	480 J	1500 UJ	1400 UJ	10 U	10 U
Benzo(g,h,i)perylene	1800 U	370 U	490 UJ	280 J	410 J	840	1200 J	1500 UJ	1400 UJ	10 U	10 U
Aniline compounds											
4-Chloroaniline	1800 U	660	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 UJ	10 U
2-Nitroaniline	4600 U	920 U	1200 UJ	1100 U	760 U	780 U	4000 UJ	3700 UJ	3600 UJ	25 U	25 U
3-Nitroaniline	4600 U	920 U	1200 UJ	1100 UJ	760 UJ	780 UJ	4000 UJ	3700 UJ	3600 UJ	25 UJ	25 U
4-Nitroaniline	4600 U	920 U	1200 UJ	1100 U	760 U	780 U	4000 UJ	3700 UJ	3600 UJ	25 U	25 U

APPENDIX D-2B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	HXB11S2	HXB12S2	HXB15S1	HXB17	HXB20	HXB21	HXBK1	HXBK2	HXBK3	HXFBA1 [1]	FBB-1 [1]
Lab Sample ID	D1860-03	D1860-02	D1911-05	E1640-06	E1640-09	E1640-10	D1891-02	D1891-03	D1891-01	E0065-02	D1891-06
Sample Location	OLD PLANT	OLD PLANT	NORTH YARD	EAST YARD	EAST YARD	EAST YARD	TUFO'S	HOLLERS AVE.	PEARTREE AVE.		
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	BACKGROUND	BACKGROUND	BACKGROUND	FIELD BLANK	FIELD BLANK
Date Sampled	11/12/97	11/12/97	11/19/97	10/1/98	10/2/98	10/2/98	11/17/97	11/17/97	11/17/97	1/16/98	11/17/97
Benzenes/Aromatics											
1,3-Dichlorobenzene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
1,4-Dichlorobenzene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
1,2-Dichlorobenzene	1800 U	130 J	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Nitrobenzene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
1,2,4-Trichlorobenzene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
2,6-Dinitrotoluene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
2,4-Dinitrotoluene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Hexachlorobenzene	1800 U	370 UJ	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Phthalates											
Dimethylphthalate	6500	370 U	490 UJ	1100 U	760 U	150 J	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Diethylphthalate	38000 D	56 J	490 UJ	1100 U	760 U	140 J	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Di-n-butyl phthalate	3900	210 J	490 UJ	110 J	760 U	680 J	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Butylbenzyl phthalate	350 J	370 U	490 UJ	490 J	760 UJ	780 UJ	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
bis(2-Ethylhexyl)phthalate	2500	520	55 J	15000 D	410 J	1000	1600 UJ	1500 UJ	1400 UJ	3 J	2 J
Di-n-octyl phthalate	1800 U	370 U	490 UJ	1100 UJ	760 UJ	780 UJ	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Other/Miscellaneous SVOCs											
bis(2-choroethyl)Ether	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
2,2'-oxybis(1-chloropropane)	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
N-Nitroso-di-n-propylamine	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Hexachloroethane	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Isophorone	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Carbazole	1800 U	370 UJ	490 UJ	1100 U	760 U	780 U	330 J	1500 UJ	1400 UJ	10 U	10 U
Hexachlorobutadiene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
bis(2-chloroethoxy)methane	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Hexachlorocyclopentadiene	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Dibenzofuran	370 JN	39 J	490 UJ	1100 U	760 U	780 U	250 J	1500 UJ	1400 UJ	10 U	10 U
4-Chlorophenyl-phenyl ether	1800 U	370 U	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
N-nitrosodiphenylamine	1800 U	370 UJ	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
4-Bromophenyl-phenyl ether	1800 U	370 UJ	490 UJ	1100 U	760 U	780 U	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
3,3'-Dichlorobenzidine	1800 UJ	370 UJ	490 UJ	1100 UJ	760 UJ	780 UJ	1600 UJ	1500 UJ	1400 UJ	10 U	10 U
Total Target SVOCs	76,320 J	3,900 J	55 J	21210 J	6873 J	15970 J	60,820 J	0 J	510 J	3 J	2 J
Number of SVOA TICs	29	30	8	19	19	19	30	1	2	0	2
Total SVOA TIC Concentration	845,800 J	105,600 J	2,820 J	30,900 J	16,300 J	42,520 J	56,880 J	400 J	730 J		90 J
Percent Solids	91%	91%	91%	92%	87%	85%	84%	89%	93%	0%	0%
Dilution Factor	5.0	1.0	1.0	3.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; NA = Not analyzed.

APPENDIX D-2C
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - PESTICIDES/PCBs (ug/kg)

Field sample ID	HXB1S3	HXB1S7	HXB3S2	HXB4S2	HXB54	HXB5S2	HXB7S2	HXB7S4	HXB8S4	HXB9S3	HXB9S5
Lab Sample ID	D1911-06	D1911-07	D1848-05	D1905-01	D1905-02	D1875-01	D1848-01	D1848-02	D1891-05	D1848-03	D1848-04
Sample Location	MW1	MW1	MW3	MW4	MW4	MW5	EAST YARD	EAST YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXB4S2 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/19/97	11/19/97	11/11/97	11/18/97	11/18/97	11/14/97	11/11/97	11/11/97	11/17/97	11/11/97	11/11/97
Pesticides											
alpha-BHC	0.56 U	0.54 U	1.9 U	0.50 U	0.39 U	3.0 J	2.4 JN	2.0 U	2.6 U	1.9 U	1.8 U
beta-BHC	0.56 U	0.54 U	1.9 U	0.50 U	0.39 U	10 JN	1.9 U	2.0 U	2.6 U	1.9 U	1.8 U
delta-BHC	3.9 JN	0.54 U	4.6	310 DJN	110 JN	1.8 U	1.9 U	2.0 U	2.6 U	6.4 JN	3.5 JN
gamma-BHC (Lindane)	0.67 JN	0.54 U	1.9 U	38 JN	20 JN	1.8 U	1.9 U	2.0 U	2.6 U	1.9 U	1.8 U
Heptachlor	0.56 U	0.54 U	1.9 U	0.50 U	0.39 U	1.8 U	1.9 U	2.0 U	2.6 U	1.9 U	1.8 U
Aldrin	0.56 U	0.54 U	1.9 U	970 DJN	110 JN	1.8 U	6.8 JN	2.0 U	220 DJN	1.9 U	1.8 U
Heptachlor Epoxide	0.56 U	0.54 U	1.9 U	0.50 U	0.39 U	1.8 U	1.9 U	2.0 U	2.6 U	1.9 U	1.8 U
Endosulfan I	0.56 U	0.54 U	1.9 U	790 DJN	73 JN	1.9 JN	1.9 U	2.0 U	2.6 U	1.9 U	1.8 U
Dieldrin	1.1 U	1.0 U	3.8 U	0.97 U	0.75 U	3.5 U	3.7 U	3.8 U	5.0 U	3.7 U	3.5 U
4,4'-DDE	5.1	1.0 U	3.8 U	260 DJN	0.75 U	5.9	3.7 U	3.8 U	5.0 U	3.7 U	6.0 JN
Endrin	2.2 JN	1.0 U	3.8 U	12 JN	11	3.5 U	11 J	3.8 U	5.0 U	3.7 U	3.5 U
Endosulfan II	1.1 U	1.0 U	3.8 U	0.97 U	0.75 U	3.5 U	3.7 U	3.8 U	5.0 U	3.7 U	3.5 U
4,4'-DDD	4.2 JN	1.0 U	3.8 U	0.97 U	12 JN	3.5 U	6.1	3.8 U	5.0 U	3.7 U	3.5 U
Endosulfan Sulfate	1.1 U	1.0 U	6.1 JN	26 JN	24 JN	3.5 U	3.7 U	3.8 U	5.0 U	3.7 U	3.5 U
4,4'-DDT	1.4 JN	1.0 U	3.8 U	300 DJN	54 JN	3.5 U	3.7 JN	3.8 U	5.0 U	3.7 U	4.5 JN
Methoxychlor	5.6 U	5.4 U	19 U	5.0 U	130 JN	18 U	19 U	20 U	26 U	19 U	18 U
Endrin ketone	1.1 U	1.0 U	3.8 U	0.97 U	0.75 U	3.5 U	3.7 U	3.8 U	5.0 U	3.7 U	3.5 U
Endrin aldehyde	1.1 U	1.0 U	3.8 U	0.97 U	0.75 U	3.5 U	5.5 JN	3.8 U	5.0 U	3.7 U	3.5 U
alpha-Chlordane	0.56 U	0.54 U	2.0	99 JN	36 JN	1.8 JN	6.6	2.0 U	2.6 U	3.5	7.1
gamma-Chlordane	2.5 JN	0.54 U	1.9 U	61 JN	17 JN	5.4 J	3.2 JN	2.0 U	2.6 U	2.2 JN	1.8 JN
Toxaphene	56 U	54 U	190 U	50 U	39 U	180 U	190 U	200 U	260 U	190 U	180 U
PCBs											
Aroclor-1016	11 U	10 U	38 U	9.7 U	7.5 U	35 U	37 U	38 U	50 U	37 U	35 U
Aroclor-1221	22 U	21 U	76 U	20 U	15 U	71 U	74 U	77 U	100 U	75 U	72 U
Aroclor-1232	11 U	10 U	38 U	9.7 U	7.5 U	35 U	37 U	38 U	50 U	37 U	35 U
Aroclor-1242	36 JN	10 U	38 U	18000 DJN	7.5 U	35 U	74	38 U	50 U	37 U	100
Aroclor-1248	11 U	10 U	38 U	9.7 U	9900 DJ	35 U	37 U	38 U	4800 DJ	44	35 U
Aroclor-1254	11 U	10 U	38 U	9.7 U	7.5 U	35 U	37 U	38 U	50 U	37 U	35 U
Aroclor-1260	11 U	10 U	38 U	9.7 U	7.5 U	35 U	37 U	38 U	50 U	37 U	35 U
Percent Solids	81%	84%	88%	90%	90%	94%	90%	87%	90%	89%	93%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; NA = Not analyzed.

APPENDIX D-2C
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - PESTICIDES/PCBs (ug/kg)

Field sample ID	HXB11S2	HXB12S2	HXB15S1	HXB17	HXB20	HXB21	HXBK1	HXBK2	HXBK3	HXFBA1 [1]	FBB-1 [1]
Lab Sample ID	D1860-03	D1860-02	D1911-05	E1640-06	E1640-09	E1640-10	D1891-02	D1891-03	D1891-01	E0065-02	D1891-06
Sample Location	OLD PLANT	OLD PLANT	NORTH YARD	EAST YARD	EAST YARD	EAST YARD	TUFO'S	HOLLERS AVE.	PEARTREE AVE.		
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	BACKGROUND	BACKGROUND	BACKGROUND	FIELD BLANK	FIELD BLANK
Date Sampled	11/12/97	11/12/97	11/19/97	10/1/98	10/2/98	10/2/98	11/17/97	11/17/97	11/17/97	1/16/98	11/17/97
Pesticides											
alpha-BHC	9.3 U	7.5 U	0.50 U	NA	NA	NA	R	2.6 UJ	2.5 U	0.050 U	0.050 UJ
beta-BHC	9.3 U	7.5 U	0.50 U	NA	NA	NA	R	2.6 UJ	2.5 U	0.050 U	0.050 UJ
delta-BHC	9.3 U	7.5 U	0.50 U	NA	NA	NA	R	2.6 UJ	2.5 U	0.050 U	0.050 UJ
gamma-BHC (Lindane)	130 JN	7.5 U	0.50 U	NA	NA	NA	R	2.6 UJ	2.5 U	0.050 U	0.050 UJ
Heptachlor	9.3 U	40 J	0.50 U	NA	NA	NA	R	2.6 UJ	2.5 U	0.050 U	0.050 UJ
Aldrin	9.3 U	7.5 U	0.73	NA	NA	NA	R	2.6 UJ	370 DJN	0.050 U	0.050 UJ
Heptachlor Epoxide	9.3 U	28	0.50 U	NA	NA	NA	2.60 JN	2.6 UJ	2.5 U	0.050 U	0.050 UJ
Endosulfan I	370 DJN	89 DJN	0.53 J	NA	NA	NA	R	2.6 UJ	2.5 U	0.050 U	0.050 UJ
Dieldrin	18 U	14 U	0.96 U	NA	NA	NA	R	5.0 UJ	4.8 U	0.10 U	0.10 UJ
4,4'-DDE	310 DJN	14 U	0.96 U	NA	NA	NA	R	5.0 UJ	100 D	0.10 U	0.10 UJ
Endrin	72 UJ	14 U	0.96 U	NA	NA	NA	9.2 JN	5.0 UJ	4.8 U	0.10 U	0.10 UJ
Endosulfan II	18 U	14 U	0.96 U	NA	NA	NA	R	5.0 UJ	4.8 U	0.10 U	0.10 UJ
4,4'-DDD	18 U	14 U	0.96 U	NA	NA	NA	R	5.0 UJ	4.8 U	0.10 U	0.10 UJ
Endosulfan Sulfate	18 U	33	2.6 JN	NA	NA	NA	R	5.0 UJ	4.8 U	0.10 U	0.10 UJ
4,4'-DDT	18 U	80 JN	0.96 U	NA	NA	NA	R	5.0 UJ	120 DJN	0.10 U	0.10 UJ
Methoxychlor	93 U	75 U	5.0 U	NA	NA	NA	41 JN	26 UJ	25 U	0.50 U	0.50 UJ
Endrin ketone	140	14 U	0.96 U	NA	NA	NA	5.6 JN	5.0 UJ	4.8 U	0.10 U	0.10 UJ
Endrin aldehyde	18 U	590 DJN	0.96 U	NA	NA	NA	R	5.0 UJ	4.8 U	0.10 U	0.10 UJ
alpha-Chlordane	9.3 U	78 JN	0.50 U	NA	NA	NA	R	2.6 UJ	2.5 U	0.050 U	0.050 UJ
gamma-Chlordane	37 UJ	7.5 U	0.50 U	NA	NA	NA	1.0	2.6 UJ	2.5 U	0.050 U	0.050 UJ
Toxaphene	930 U	750 U	50 U	NA	NA	NA	R	260 UJ	250 U	5.0 U	5.0 UJ
PCBs											
Aroclor-1016	180 U	140 U	9.6 U	36 U	38 U	39 U	R	50 UJ	48 U	1.0 U	1.0 UJ
Aroclor-1221	370 U	290 U	20 U	73 U	77 U	79 U	R	100 UJ	97 U	2.0 U	2.0 UJ
Aroclor-1232	180 U	140 U	9.6 U	36 U	38 U	39 U	R	50 UJ	48 U	1.0 U	1.0 UJ
Aroclor-1242	180 U	140 U	9.6 U	36 U	38 U	39 U	R	50 UJ	48 U	1.0 U	1.0 UJ
Aroclor-1248	180 U	140 U	13	1000 J	38 U	39 U	R	50 UJ	5600 J	1.0 U	1.0 UJ
Aroclor-1254	180 U	140 U	9.6 U	36 U	38 U	39 U	R	50 UJ	48 U	1.0 U	1.0 UJ
Aroclor-1260	180 U	140 U	9.6 U	R	38 U	R	R	50 UJ	1100 JN	1.0 U	1.0 UJ
Percent Solids	91%	91%	91%	92%	87%	85%	84%	89%	93%	100%	0%
Dilution Factor	5.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:

1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; NA = Not analyzed.

APPENDIX D-2D
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - INORGANICS (mg/kg)

Field sample ID	HXB1S3	HXB1S7	HXB3S2	HXB4S2	HXB54	HXB5S2	HXB7S2	HXB7S4	HXB8S4	HXB9S3	HXB9S5
Lab Sample ID	D1911-06	D1911-07	D1848-05	D1905-01	D1905-2	D1875-01	D1848-01	D1848-02	D1891-05	D1848-03	D1848-04
Sample Location	MW1	MW1	MW3	MW4	MW4	MW5	EAST YARD	EAST YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXB4S2 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/19/97	11/19/97	11/11/97	11/18/97	11/18/97	11/14/97	11/11/97	11/11/97	11/17/97	11/11/97	11/11/97
Aluminum	14200	16900	10900	3890 J	4190 J	20600	13000	13600	15500	15200	11600
Antimony	0.63 U	0.55 U	0.61 U	0.45 U	0.45 U	0.86	0.57 U	0.58 U	0.49 U	0.61 U	0.51 U
Arsenic	4.7	3.4	3.0	1.8	2.0	4.4 J	3.6	2.7	3.3 J	2.5	1.9
Barium	323	152	172	74.5 J	86.4 J	242	182	133	161	195	99.8
Beryllium	0.54	0.74	0.48	0.15 U	0.15 U	0.56	0.56	0.47	0.44	0.62	0.52
Cadmium	5.7	0.11 U	1.2	0.09 U	0.09 U	0.12 U	1.5	0.31	0.10 U	0.58	0.26
Calcium	19700	1600	6660	337 J	342 J	1260	11600	1450	1250	2130	1070
Chromium	62.7	78.3	33.3	28.8 J	29.1 J	174	56.6	56.4	44.4	63.1	63.7
Cobalt	13.6	14.4	11.9	4.3 J	4.7 J	18.8	13.2	12.5	16.4	16.0	16.3
Copper	185 J	52.1 J	45.1	31.1 J	34.9 J	46.8	36.5	35.6	16.7 J	38.0	42.3
Iron	28200	26700	110	7360 J	7700 J	31500	27500	23600	24900	20500	19900
Lead	182 J	8.2 J	265	7.6 J	8.2 J	4.0	121	41.6	0.69	32.6	2.8
Magnesium	7450	8230	4570	1720 J	2010 J	9200	9360	6750	6180	6500	5980
Manganese	384	266	225 J	62.3 J	66.3 J	497	252 J	180 J	217	315 J	255 J
Mercury	0.28	0.04	0.07	0.16	0.18	0.06	0.29	0.03 U	0.03 U	0.16	0.03 U
Nickel	62.0	64.6	32.6	27.9 J	24.9 J	85.1	71.8	44.6	30.8	35.1	48.6
Potassium	5790 J	8320 J	4850	2190 J	2350 J	12000 J	7280	7720	10300 J	8820	4570
Selenium	1.1 U	0.91 U	1.1	0.75 U	0.75 U	0.99 U	0.95 U	0.97 U	0.81 U	1.0 U	0.85 U
Silver	0.42 UJ	0.36 UJ	0.41 UJ	0.30 UJ	0.30 UJ	0.40 UJ	0.38 UJ	0.39 UJ	0.32 UJ	0.40 UJ	0.34 UJ
Sodium	540	415	264	96.9	61.4	69.3	148	127	157	182	253
Thallium	0.85	1.1	0.41 U	0.30 U	0.30 U	1.6	0.38 U	0.39 U	1.2	0.42	0.34 U
Vanadium	45.0	48.1	33.8	13.6 J	15.2 J	72.5	36.5	40.4	45.1	41.9	37.1
Zinc	1290	124	279 J	21.3	23.8	81.9	219 J	116 J	69.1 J	153 J	96.4 J
Cyanide	1.1 U	1.0 U	0.84 U	0.70 U	0.77 U	1.0 U	0.65 U	0.64 U	0.79 U	0.82 U	0.85 U
Percent Solids	81%	84%	88%	90%	90%	89%	90%	87%	90%	89%	93%
Level	Low	Low	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

Notes:

1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; NA = Not analyzed.

APPENDIX D-2D
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - INORGANICS (mg/kg)

Field sample ID	HXB11S2	HXB12S2	HXB15S1	HXB17	HXB20	HXB21	HXBK1	HXBK2	HXBK3	HXFBA1 [1]	FBB-1 [1]
Lab Sample ID	D1860-03	D1860-02	D1911-05	E1640-06	E1640-09	E1640-10	D1891.02	D1891-03	D1891-01	E0065-02	D1891-06
Sample Location	OLD PLANT	OLD PLANT	NORTH YARD	EAST YARD	EAST YARD	EAST YARD	TUFO'S	HOLLERS AVE.	PEARTREE AVE.		
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	BACKGROUND	BACKGROUND	BACKGROUND	FIELD BLANK	FIELD BLANK
Date Sampled	11/12/97	11/12/97	11/19/97	10/1/98	10/2/98	10/2/98	11/17/97	11/17/97	11/17/97	1/16/98	11/17/97
Aluminum	4410	21300	16100	9410	11000	10700	16600	20400	13200	15.0 U	36.8
Antimony	0.47 U	0.55 U	0.54 U	3.6 J	9.0 J	29.7 J	0.66 U	0.57 U	0.62 U	3.0 U	3.0 U
Arsenic	1.1	1.9	4.8	5.8 J	5.0 J	18.4 J	9.0 J	3.2	2.4	2.0 U	2.0 U
Barium	64.8	295	341	366	522	1790	559	162	89.2	43.5	8.6
Beryllium	0.16 U	0.49	0.48	0.29	0.38	0.33	0.69	0.84	0.45	1.0 U	1.0 U
Cadmium	0.09 U	0.24	5.6	4.2 J	6.4 J	28.2 J	1.3	0.11 U	0.12 U	0.60 U	0.60 U
Calcium	663	836	15800	8200	5790	17600	3120	1500	853	3860	35.9
Chromium	21.7	162	44.9	42.8 J	47.8 J	73.9 J	61.8	64.5	42.4	0.50 U	0.50 U
Cobalt	4.7	19.7	13.3	9.4	9.8	22.6	14.8	18.7	12.8	1.0 U	1.0 U
Copper	10.6	467	151 J	139 J	125 J	509 J	196 J	33.5 J	19.1 J	3.0 U	11.1
Iron	7030	32600	27900	22500	29000	54100	57900	26700	19300	18.6	82.7
Lead	2.5	23.4	180 J	515 J	3850 J	3360 J	455	8.1	10.1	3.8 J	2.0 U
Magnesium	2060	8580	7730	4910	5840	5540	5820	8570	5380	289	9.0 U
Manganese	77.1	226	394	246	369	509	280	503	472	2.6 J	2.3
Mercury	11.9	0.63	0.03 U	0.23	0.19	0.78	0.07	0.04 U	0.04 U	0.10 UJ	0.38 U
Nickel	13.8	44.7	38.0	25.7 J	18.3 J	181 J	72.3	44.1	30.4	3.0 U	3.0 U
Potassium	2280 J	13200 J	8110 J	4860 J	5290 J	4430 J	4900 J	6750 J	3610 J	1300 U	1300 U
Selenium	0.78 U	0.92 U	0.90 U	3.2	2.0	7.1	1.1 U	0.95 U	1.0 U	5.4	5.0 U
Silver	0.31 UJ	0.37 UJ	0.36 UJ	R	R	R	0.44 UJ	0.38 UJ	0.41 UJ	2.0 U	2.0 UJ
Sodium	152	361	327	1830	1660	15600	75.3	63.8	116	2860	300 U
Thallium	0.31 U	0.37 U	0.99	2.4	2.3	0.93	1.5	1.3	0.92	2.0 U	2.0 U
Vanadium	13.8	68.3	50.3	40.9 J	33.1 J	48.4 J	46.7	51.7	32.9	1.0 U	1.0 U
Zinc	37.6 J	124 J	1070	1350 J	1390 J	12000 J	1100 J	61.2 J	52.8 J	70.9 J	23.7 J
Cyanide	1.1 U	0.98 U	0.84 U	0.05 U	0.08	0.27	1.1 U	0.87 U	0.90 U	1000 U	1000 U
Percent Solids	91%	91%	91%	94%	89%	88%	84%	89%	93%	0%	0%
Level	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; NA = Not analyzed.

APPENDIX D-2E
HEXAGON LABORATORIES RI/FFS
SUBSURFACE BORING ANALYTICAL DATA - TOTAL ORGANIC CARBON AND TOTAL PETROLEUM HYDROCARBONS (mg/kg)

Field sample ID	HXB1S3	HXB1S7	HXB4S2	HXB54	HXB5S2	HXB11S2	HXB12S2	HXB20	HXBK1	HXBK2	HXBK3
Lab Sample ID	D1911-06	D1911-07	D1905-01	D1905-02	D1875-01	D1860-03	D1860-02	E1640-09	D1891-02	D1891-03	D1891-01
Sample Location	MW1	MW1	MW4	MW4	MW5	OLD PLANT	OLD PLANT	EAST YARD	TUFO'S	HOLLERS AVE.	PEARTREE AVE
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXB4S2 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	BACKGROUND	BACKGROUND	BACKGROUND
Date Sampled	11/19/97	11/19/97	11/18/97	11/18/97	11/14/97	11/12/97	11/12/97	10/2/98	11/17/97	11/17/97	11/17/97
TOC	11000	519	12000	11200	2200	25900	NA	5500	6210	3690	4130
TPHC	NA	NA	NA	NA	NA	NA	1200	NA	NA	NA	58

Notes:
1. NA = Not analyzed.

APPENDIX D-3A
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	NYT-1	NYT-2	SYTN-1	SYTNX-1	SYTS-1	SYTE-1	SYTW-1	SYTC-1	SYTCX-1	SYTEX-1	SYTEX-1MS
Lab Sample ID	D1875-02	D1875-03	D1991-01	D1991-07	D1991-02	D1991-03	D1991-04	D1991-05	D1991-06	D1991-09	D1991-09MS
Sample Location	NY UST	NY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTN-1 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTC-1 DUP.	ENV. SAMPLE	MS
Date Sampled	11/14/97	11/14/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/5/97
Aromatics											
Benzene	15 J	4 J	760 J	770 J	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	16000
Toluene	720	28 J	190000 DJ	220000 DJ	240000 J	66000 J	320000 J	NA	NA	3400 J	19000
Ethylbenzene	200	30 J	6400 J	7500 J	33000 UJ	6600 J	140000 UJ	NA	NA	3800 J	3700 B
Xylene(total)	1200	17 J	30000 J	35000 J	24000 J	60000 J	140000 UJ	NA	NA	6400 J	6400 B
Styrene	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Halogenated Aliphatics											
Chloromethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Bromomethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Vinyl Chloride	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Chloroethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Methylene Chloride	120 U	14 J	3300 UJ	180 J	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
1,1-Dichloroethene	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	13000
1,1-Dichloroethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
1,2-Dichloroethene (total)	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Chloroform	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
1,2-Dichloroethane	130	26 UJ	5000 J	5000 J	33000 UJ	5700 UJ	140000 UJ	NA	NA	330 J	2900 U
1,1,1-Trichloroethane	120 U	26 UJ	370 J	370 J	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Carbon Tetrachloride	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Bromodichloromethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
1,2-Dichloropropane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
cis-1,3-Dichloropropene	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Trichloroethene	30 J	26 UJ	3200 J	3600 J	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	15000
Dibromochloromethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
1,1,2-Trichloroethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
trans-1,3-Dichloropropene	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Bromoform	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Tetrachloroethene	29 J	26 UJ	5900 J	6700 J	7600 J	1700 J	140000 UJ	NA	NA	1400 J	1600 JB
1,1,2,2-Tetrachloroethane	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Ketones											
Acetone	65 J	230 J	9200 J	8900 J	33000 UJ	5700 UJ	140000 UJ	NA	NA	13000 J	14000 B
2-Butanone	120 U	8 J	500 J	430 J	33000 UJ	720 J	140000 UJ	NA	NA	460 J	540 J
4-Methyl-2-pentanone	120 U	26 UJ	3300 UJ	190 J	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
2-Hexanone	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Other/Miscellaneous VOCs											
Carbon disulfide	120 U	26 UJ	3300 UJ	3100 UJ	33000 UJ	5700 UJ	140000 UJ	NA	NA	2900 UJ	2900 U
Chlorobenzene	120 U	7 J	10000 J	12000 J	33000 UJ	75000 J	140000 UJ	NA	NA	6700 J	21000 B
Total Target VOCs	2389 J	338 J	261330 J	300640 J	271600 J	210020 J	320000 J			35490 J	110240 J
Number of VOC TICs	29	30	4	5	0	29	0			1	
Total VOC TIC Concentration	79500 J	7380 J	12500 J	18600 J		405000 J				3500 J	
Percent Solids	85%	77%	75%	80%	76%	87%	88%			87%	87%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0			1.0	1.0
Level	Low	Low	Medium	Medium	Medium	Medium	Medium			Medium	Medium

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; D = Diluted sample; B = Detected in blank; NA = Not analyzed.

APPENDIX D-3A
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	SYTEX-1MSD	EYT34-1	EYT35-1	EYT36-1	EYT37-1	NPT-1	NPT-2	NPT-3	NPT-4	SYTFB-1 [1]	EYTFB-1 [1]
Lab Sample ID	D1991-09MSD	D1349-01	D1349-02	D1349-03	D1349-04	D1911-01	D1911-03	D1911-02	D1911-04	D1991-08	D1349-05
Sample Location	SY UST	EY UST	EY UST	EY UST	EY UST	NP UST	NP UST	NP UST	NP UST		
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK
Date Sampled	12/5/97	8/29/97	8/29/97	8/29/97	8/29/97	11/19/97	11/19/97	11/19/97	11/19/97	12/5/97	8/29/97
Aromatics											
Benzene	16000	12 U	11 U	11 U	12 U	1700 J	4800 J	7800 J	55000	10 UJ	10 U
Toluene	18000	12 U	11 U	11 U	70	37000	1700000 D	1200000 D	1700000 D	10 UJ	10 U
Ethylbenzene	3600 B	12 U	11 U	11 U	12 U	560 J	55000	15000	33000	10 UJ	10 U
Xylene(total)	6200 B	12 U	11 U	11 U	12 U	24000	300000	1500000 D	200000	10 UJ	10 U
Styrene	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Halogenated Aliphatics											
Chloromethane	2900 U	12 UJ	11 UJ	11 UJ	12 UJ	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Bromomethane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Vinyl Chloride	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Chloroethane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Methylene Chloride	2900 U	12 U	11 U	11 U	12 U	820 J	12000 U	1500 J	11000 U	10 UJ	3 JB
1,1-Dichloroethene	13000	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
1,1-Dichloroethane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
1,2-Dichloroethene (total)	2900 U	12 U	11 U	11 U	12 U	280 J	830 J	1200 J	3700 J	10 UJ	10 U
Chloroform	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	2 J
1,2-Dichloroethane	2900 U	12 U	11 U	11 U	12 U	6300	38000	43000	29000	10 UJ	10 U
1,1,1-Trichloroethane	2900 U	12 U	11 U	11 U	4 J	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Carbon Tetrachloride	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Bromodichloromethane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
1,2-Dichloropropane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
cis-1,3-Dichloropropene	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Trichloroethene	15000	12 U	11 U	11 U	12 U	460 J	46000	12000	1200 J	10 UJ	10 U
Dibromochloromethane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
1,1,2-Trichloroethane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
trans-1,3-Dichloropropene	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Bromoform	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Tetrachloroethene	1500 JB	12 U	11 U	11 U	12 U	440 J	100000	12000	690 J	10 UJ	10 U
1,1,2,2-Tetrachloroethane	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Ketones											
Acetone	13000 B	21 UJ	27 UJ	12 UJ	16 UJ	1000 J	12000 U	3200 J	11000 U	3 J	6 JB
2-Butanone	460 J	12 U	11 U	11 U	12 U	3400 UJ	12000 U	12000 U	11000 U	10 UJ	10 U
4-Methyl-2-pentanone	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
2-Hexanone	2900 U	12 U	11 U	11 U	12 U	3400 UJ	12000 U	12000 U	11000 U	10 UJ	10 U
Other/Miscellaneous VOCs											
Carbon disulfide	2900 U	12 U	11 U	11 U	12 U	3400 U	12000 U	12000 U	11000 U	10 UJ	10 U
Chlorobenzene	21000 B	12 U	11 U	11 U	2 J	470 J	12000	12000 U	5000 J	10 UJ	10 U
Total Target VOCs	107760 J	0 J	0 J	0 J	76 J	73030 J	2256630 J	2795700 J	2027590 J	3 J	11 J
Number of VOC TICs		0	1	0	0	0	6	5	25	1	0
Total VOC TIC Concentration			*24 J*				*194100 J*	*46700 J*	*291500 J*	*8 J*	
Percent Solids	87%	85%	92%	91%	84%	74%	85%	84%	88%	100%	100%
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Level	Medium	Low	Low	Low	Low	Medium	Medium	Medium	Medium	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; D = Diluted sample; B = Detected in blank; NA = Not analyzed.

APPENDIX D-3B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	NYT-1	NYT-2	SYTN-1	SYTNX-1	SYTS-1	SYTE-1	SYTW-1	SYTC-1	SYTCX-1	SYTEX-1	SYTEX-1MS
Lab Sample ID	D1875-02	D1875-03	D1991-01	D1991-07	D1991-02	D1991-03	D1991-04	D1991-05	D1991-06	D1991-09	D1991-09MS
Sample Location	NY UST	NY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTN-1 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTC-1 DUP.	ENV. SAMPLE	MS
Date Sampled	11/14/97	11/14/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97
Phenols/Acid Extractables											
Phenol	2000 U	420 U	NA	NA	NA	NA	NA	R	R	530 U	2000
2-Chlorophenol	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	2500
2-Methylphenol (o-cresol)	2000 U	130 J	NA	NA	NA	NA	NA	2900 U	520 U	R	90 J
4- Methylphenol	2000 U	420 U	NA	NA	NA	NA	NA	2300 J	820	80 JN	57 J
2,4-Dimethylphenol	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
2,4-Dichlorophenol	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
4-Chloro-3-methylphenol	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	2600
2,4,6-Trichlorophenol	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
2,4,5-Trichlorophenol	5000 U	1000 UJ	NA	NA	NA	NA	NA	7200 U	1300 U	1300 U	1300 U
2,4-Dinitrophenol	5000 UJ	1000 UJ	NA	NA	NA	NA	NA	7200 U	1300 U	1300 U	1300 U
2-Nitrophenol	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
4-Nitrophenol	5000 U	1000 UJ	NA	NA	NA	NA	NA	7200 UJ	1300 UJ	1300 UJ	4800 E
4,6-Dinitro-2-methylphenol	5000 U	1000 U	NA	NA	NA	NA	NA	7200 U	1300 U	1300 UJ	1300 U
Pentachlorophenol	5000 U	1000 U	NA	NA	NA	NA	NA	7200 UJ	1300 UJ	210 JN	1600
Polycyclic Aromatic Hydrocarbons (PAHs)											
Naphthalene	3800	600	NA	NA	NA	NA	NA	4500	1100	200 J	160 J
2-Methylnaphthalene	14000	1200	NA	NA	NA	NA	NA	16000	3800	460 J	480 J
2-Chloronaphthalene	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Acenaphthylene	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Acenaphthene	380 J	170 J	NA	NA	NA	NA	NA	2900 U	520 U	530 U	1400
Fluorene	1100 J	370 J	NA	NA	NA	NA	NA	2400 J	710	55 J	70 J
Phenanthrene	2200	1100	NA	NA	NA	NA	NA	8600	2300	290 J	400 J
Anthracene	280 J	160 J	NA	NA	NA	NA	NA	2900 UJ	520 UJ	54 J	64 J
Fluoranthene	2000 U	440	NA	NA	NA	NA	NA	740 J	520 U	530 UJ	530 U
Pyrene	2000 U	180 J	NA	NA	NA	NA	NA	2500 JN	520 U	R	1600
Benzo(a)anthracene	2000 U	140 JN	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Chrysene	2000 U	200 J	NA	NA	NA	NA	NA	40000 DJ	13000 DJ	840	1100
Benzo(b)fluoranthene	2000 U	240 J	NA	NA	NA	NA	NA	380 J	160 J	82 JN	100 J
Benzo(k)fluoranthene	2000 U	110 JN	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Benzo(a)pyrene	2000 U	180 J	NA	NA	NA	NA	NA	R	520 U	58 J	74 J
Indeno(1,2,3-cd)pyrene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Dibenz(a,h)anthracene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Benzo(g,h,i)perylene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Aniline Compounds											
4-Chloroaniline	2000 U	420 U	NA	NA	NA	NA	NA	2900 UJ	520 UJ	530 UJ	530 U
2-Nitroaniline	5000 U	1000 UJ	NA	NA	NA	NA	NA	7200 U	1300 U	1300 U	1300 U
3-Nitroaniline	5000 U	1000 UJ	NA	NA	NA	NA	NA	7200 UJ	1300 UJ	1300 UJ	1300 U
4-Nitroaniline	5000 U	1000 JN	NA	NA	NA	NA	NA	7200 U	1300 U	1300 U	1300 U

APPENDIX D-3B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	NYT-1	NYT-2	SYTN-1	SYTNX-1	SYTS-1	SYTE-1	SYTW-1	SYTC-1	SYTCX-1	SYTEX-1	SYTEX-1MS
Lab Sample ID	D1875-02	D1875-03	D1991-01	D1991-07	D1991-02	D1991-03	D1991-04	D1991-05	D1991-06	D1991-09	D1991-09MS
Sample Location	NY UST	NY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTN-1 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTC-1 DUP.	ENV. SAMPLE	MS
Date Sampled	11/14/97	11/14/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97
Benzenes/Aromatics											
1,3-Dichlorobenzene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
1,4-Dichlorobenzene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	1400
1,2-Dichlorobenzene	2000 U	420 U	NA	NA	NA	NA	NA	140000 D	19000 D	110 J	530 U
Nitrobenzene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
1,2,4-Trichlorobenzene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	1600
2,6-Dinitrotoluene	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
2,4-Dinitrotoluene	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	1900
Hexachlorobenzene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 UJ	530 U
Phthalates											
Dimethylphthalate	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Diethylphthalate	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	R	86 J	110 J
Di-n-butyl phthalate	2000 U	94 J	NA	NA	NA	NA	NA	2900 U	520 U	680 J	450 J
Butylbenzyl phthalate	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	61 JN	160 JN	140 J
bis(2-Ethylhexyl)phthalate	2000 U	150 J	NA	NA	NA	NA	NA	850 J	270 J	1200 J	1800
Di-n-octyl phthalate	2000 U	420 U	NA	NA	NA	NA	NA	2900 UJ	520 U	530 UJ	160 J
Other/Miscellaneous SVOCs											
bis(2-choroethyl)Ether	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
2,2'-oxybis(1-chloropropane)	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
N-Nitroso-di-n-propylamine	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	1300
Hexachloroethane	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Isophorone	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Carbazole	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 UJ	530 U
Hexachlorobutadiene	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
bis(2-chloroethoxy)methane	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Hexachlorocyclopentadiene	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
Dibenzofuran	2000 U	110 JN	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
4-Chlorophenyl-phenyl ether	2000 U	420 UJ	NA	NA	NA	NA	NA	2900 U	520 U	530 U	530 U
N-nitrosodiphenylamine	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 UJ	530 U
4-Bromophenyl-phenyl ether	2000 U	420 U	NA	NA	NA	NA	NA	2900 U	520 U	530 UJ	530 U
3,3'-Dichlorobenzidine	2000 UJ	420 U	NA	NA	NA	NA	NA	2,900 U	520 U	530 U	530 U
Total Target SVOCs	21,760 J	6,574 J						218,270 J	41,221 J	4,565 J	27,955 J
Number of SVOC TICs	39	37						36	35	28	
Total SVOC TIC Concentration	190,400 J	91,230 J						320,800 J	216,770 J	87,210 J	
Percent Solids	84%	80%						77%	85%	84%	84%
Dilution Factor	5.0	1.0						5.0	1.0	1.0	1.0
Level	Low	Low						Low	Low	Low	Low

Notes:

1. Field blank concentration reported in ug/L.
2. *U = Not detected; J = Estimated value; R = Rejected value; D = Diluted sample; E = Exceeds instrument calibration range; N = Presumptive evidence of presence; B = Detected in blank; NA = Not analyzed.*

APPENDIX D-3B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	SYTEX-1MSD	EYT34-1	EYT35-1	EYT36-1	EYT37-1	NPT-1	NPT-2	NPT-3	NPT-4	SYTFB-1 [1]	EYTFB-1[1]
Lab Sample ID	D1991-09MSD	D1349-01	D1349-02	D1349-03	D1349-04	D1911-01	D1911-03	D1911-02	D1911-04	D1991-08	D1349-05
Sample Location	SY UST	EY UST	EY UST	EY UST	EY UST	NP UST	NP UST	NP UST	NP UST		
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK
Date Sampled	12/4/97	8/29/97	8/29/97	8/29/97	8/29/97	11/19/97	11/19/97	11/19/97	11/19/97	12/4/97	8/29/97
Phenols/Acid Extractables											
Phenol	2000	400 U	360 U	360 U	390 U	1200 J	2600 UJ	310 J	520 UJ	10 U	NA
2-Chlorophenol	2500	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 U	520 UJ	10 U	NA
2-Methylphenol (o-cresol)	110 J	400 U	360 U	360 U	390 U	510 J	2800 J	2600 U	520 UJ	10 U	NA
4- Methylphenol	65 J	400 U	360 U	360 U	390 U	3600 J	2600 UJ	630 J	6400 DJ	10 U	NA
2,4-Dimethylphenol	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 U	520 UJ	10 U	NA
2,4-Dichlorophenol	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 U	520 UJ	10 U	NA
4-Chloro-3-methylphenol	2500	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 U	520 UJ	10 U	NA
2,4,6-Trichlorophenol	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 U	520 UJ	10 U	NA
2,4,5-Trichlorophenol	1300 U	990 U	900 U	900 U	970 U	1600 UJ	6400 UJ	6600 U	1300 UJ	25 U	NA
2,4-Dinitrophenol	1300 U	990 UJ	900 UJ	900 UJ	970 UJ	1600 UJ	6400 UJ	6600 U	1300 UJ	25 U	NA
2-Nitrophenol	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 U	520 UJ	10 U	NA
4-Nitrophenol	4700 E	990 U	900 U	900 U	970 U	1600 UJ	6400 UJ	6600 U	1300 UJ	25 U	NA
4,6-Dinitro-2-methylphenol	1300 U	990 U	900 U	900 U	970 U	1600 UJ	6400 UJ	6600 U	1300 UJ	25 U	NA
Pentachlorophenol	1500	990 U	900 U	900 U	970 U	1600 UJ	6400 UJ	6600 U	1300 UJ	25 U	NA
Polycyclic Aromatic Hydrocarbons (PAHs)											
Naphthalene	160 J	400 U	360 U	360 U	390 U	180 J	600 J	3800 J	7000 DJ	10 U	NA
2-Methylnaphthalene	440 J	400 U	360 U	360 U	390 U	280 J	2400 J	17000 J	26000 DJ	10 U	NA
2-Chloronaphthalene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Acenaphthylene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Acenaphthene	1300	400 U	360 U	360 U	390 U	640 UJ	300 J	1100 J	520 UJ	10 U	NA
Fluorene	67 J	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	1100 J	520 UJ	10 U	NA
Phenanthrene	380 J	400 U	360 U	360 U	390 U	73 J	790 J	2400 J	520 UJ	10 U	NA
Anthracene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	390 J	640 DJ	10 U	NA
Fluoranthene	530 U	400 U	360 U	360 U	390 U	640 UJ	310 J	2600 UJ	520 UJ	10 U	NA
Pyrene	1500	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	830 J	2400 JN	10 U	NA
Benzo(a)anthracene	780	400 U	140 J	360 U	390 U	640 UJ	2600 UJ	2600 UJ	680 JN	10 U	NA
Chrysene	900	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	1900 J	780 JN	10 U	NA
Benzo(b)fluoranthene	96 J	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Benzo(k)fluoranthene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Benzo(a)pyrene	59 J	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	220 JN	10 U	NA
Indeno(1,2,3-cd)pyrene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Dibenz(a,h)anthracene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Benzo(g,h,i)perylene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Aniline Compounds											
4-Chloroaniline	530 U	400 U	360 U	360 U	390 U	640 UJ	2700 J	2600 UJ	520 UJ	10 U	NA
2-Nitroaniline	1300 U	990 U	900 U	900 U	970 U	1600 UJ	6400 UJ	6600 UJ	1300 UJ	25 U	NA
3-Nitroaniline	1300 U	990 U	900 U	900 U	970 U	1600 UJ	6400 UJ	6600 UJ	1300 UJ	25 U	NA
4-Nitroaniline	1300 U	990 U	900 U	900 U	970 U	1600 UJ	6400 UJ	6600 UJ	1300 UJ	25 U	NA

APPENDIX D-3B
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	SYTEX-1MSD	EYT34-1	EYT35-1	EYT36-1	EYT37-1	NPT-1	NPT-2	NPT-3	NPT-4	SYTFB-1 [1]	EYTFB-1[1]
Lab Sample ID	D1991-09MSD	D1349-01	D1349-02	D1349-03	D1349-04	D1911-01	D1911-03	D1911-02	D1911-04	D1991-08	D1349-05
Sample Location	SY UST	EY UST	EY UST	EY UST	EY UST	NP UST	NP UST	NP UST	NP UST		
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK
Date Sampled	12/4/97	8/29/97	8/29/97	8/29/97	8/29/97	11/19/97	11/19/97	11/19/97	11/19/97	12/4/97	8/29/97
Benzenes/Aromatics											
1,3-Dichlorobenzene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
1,4-Dichlorobenzene	1300	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	280 J	520 UJ	10 U	NA
1,2-Dichlorobenzene	530 U	400 U	360 U	360 U	390 U	69 J	27000 DJ	2200 J	680 JN	10 U	NA
Nitrobenzene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
1,2,4-Trichlorobenzene	1600	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
2,6-Dinitrotoluene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
2,4-Dinitrotoluene	1700	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Hexachlorobenzene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Phthalates											
Dimethylphthalate	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Diethylphthalate	90 J	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Di-n-butyl phthalate	670	400 U	360 U	360 U	390 U	510 J	480 J	260 J	520 UJ	10 U	NA
Butylbenzyl phthalate	200 J	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
bis(2-Ethylhexyl)phthalate	1400	400 U	53 J	360 U	390 U	81 J	690 J	2600 UJ	520 UJ	1 JB	NA
Di-n-octyl phthalate	230 J	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Other/Miscellaneous SVOCs											
bis(2-choroethyl)Ether	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
2,2'-oxybis(1-chloropropane)	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
N-Nitroso-di-n-propylamine	1300	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Hexachloroethane	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Isophorone	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Carbazole	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	1300 J	520 UJ	10 U	NA
Hexachlorobutadiene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
bis(2-chloroethoxy)methane	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Hexachlorocyclopentadiene	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
Dibenzofuran	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	750 J	520 UJ	10 U	NA
4-Chlorophenyl-phenyl ether	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
N-nitrosodiphenylamine	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
4-Bromophenyl-phenyl ether	530 U	400 U	360 U	360 U	390 U	640 UJ	2600 UJ	2600 UJ	520 UJ	10 U	NA
3,3'-Dichlorobenzidine	530 U	400 U	360 U	360 U	390 U	640 UJ	2,600 UJ	2,600 UJ	520 UJ	10 U	NA
Total Target SVOCs	27,547 J	0 J	193 J	0 J	0 J	6,503 J	38,070 J	34,250 J	44,800 J	1 J	
Number of SVOC TICs		1	23	7	12	31	29	29	38	0	
Total SVOC TIC Concentration		140 J	9,289 J	1,980 J	1,851 J	28,670 J	689,300 J	205,200 J	383,900 J		
Percent Solids	84%	84%	93%	92%	86%	69%	87%	84%	85%	0%	
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	5.0	5.0	1.0	1.0	
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; D = Diluted sample; E = Exceeds instrument calibration range; N = Presumptive evidence of presence; B = Detected in blank; NA = Not analyzed.

APPENDIX D-3C
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - PESTICIDES/PCBs (ug/kg)

Field sample ID	NYT-1	NYT-2	SYTN-1	SYTNX-1	SYTS-1	SYTE-1	SYTW-1	SYTC-1	SYTCX-1	SYTEX-1	SYTEX-1MS
Lab Sample ID	D1875-02	D1875-03	D1991-01	D1991-07	D1991-02	D1991-03	D1991-04	D1991-05	D1991-06	D1991-09	D1991-09MS
Sample Location	NY UST	NY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTN-1 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTC-1 DUP.	ENV. SAMPLE	MS
Date Sampled	11/14/97	11/14/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97
Pesticides											
alpha-BHC	2.6 JN	1.8 U	NA	NA	NA	NA	NA	12 U	26 U	54 U	54 U
beta-BHC	1.7 U	1.8 U	NA	NA	NA	NA	NA	12 U	26 U	54 U	54 U
delta-BHC	1.7 U	1.8 U	NA	NA	NA	NA	NA	12 U	26 U	54 U	54 U
gamma-BHC (Lindane)	2.9	1.8 U	NA	NA	NA	NA	NA	12 U	26 U	54 U	54 U
Heptachlor	2.5	1.8 U	NA	NA	NA	NA	NA	12 U	26 U	54 U	54 U
Aldrin	1.7 U	1.8 U	NA	NA	NA	NA	NA	180 JN	200 JN	330 JN	220 P
Heptachlor Epoxide	1.7 U	1.8 U	NA	NA	NA	NA	NA	12 U	26 U	54 U	54 U
Endosulfan I	2.7	1.8 U	NA	NA	NA	NA	NA	R	R	54 U	54 U
Dieldrin	5.7	3.5 U	NA	NA	NA	NA	NA	23 U	51 U	100 U	100 U
4,4'-DDE	3.4 U	3.5 U	NA	NA	NA	NA	NA	79 J	64	100 U	100 U
Endrin	4.8	3.5 U	NA	NA	NA	NA	NA	R	51 U	100 U	100 U
Endosulfan II	3.4 U	3.5 U	NA	NA	NA	NA	NA	23 U	51 U	100 U	100 U
4,4'-DDD	5.5 JN	3.5 U	NA	NA	NA	NA	NA	23 U	51 U	100 U	100 U
Endosulfan Sulfate	3.4 U	3.5 U	NA	NA	NA	NA	NA	23 U	51 U	100 U	100 U
4,4'-DDT	5.5 JN	3.5 U	NA	NA	NA	NA	NA	R	R	100 U	100 U
Methoxychlor	26	18 U	NA	NA	NA	NA	NA	120 U	260 U	540 U	540 U
Endrin ketone	3.4 U	3.5 U	NA	NA	NA	NA	NA	23 U	51 U	100 U	100 U
Endrin aldehyde	3.4 U	3.5 U	NA	NA	NA	NA	NA	23 U	51 U	100 U	100 U
alpha-Chlordane	1.7 U	7.9 JN	NA	NA	NA	NA	NA	12 U	26 U	54 U	54 U
gamma-Chlordane	1.7 U	7.6 JN	NA	NA	NA	NA	NA	R	26 U	54 U	54 U
Toxaphene	170 U	180 U	NA	NA	NA	NA	NA	1200 U	2600 U	5400 U	5400 U
PCBs											
Aroclor-1016	34 U	35 U	NA	NA	NA	NA	NA	230 U	510 U	1000 U	1000 U
Aroclor-1221	68 U	71 U	NA	NA	NA	NA	NA	460 U	1000 U	2100 U	2100 U
Aroclor-1232	34 U	35 U	NA	NA	NA	NA	NA	230 U	510 U	1000 U	1000 U
Aroclor-1242	34 U	100 J	NA	NA	NA	NA	NA	230 U	510 U	1000 U	1000 U
Aroclor-1248	34 U	35 U	NA	NA	NA	NA	NA	4500	3600	6100	3800
Aroclor-1254	34 U	35 U	NA	NA	NA	NA	NA	230 U	510 U	1000 U	1000 U
Aroclor-1260	34 U	35 U	NA	NA	NA	NA	NA	230 U	510 U	1000 U	1000 U
Percent Solids	98%	94%	100%	100%	100%	100%	100%	77%	85%	84%	84%
Dilution Factor	1	1.0	1.0	1.0	1.0	1.0	1.0	20.0	50.0	100.0	100.0

Notes:
1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; D = Diluted sample; N = Presumptive evidence of presence; P = Dual column precision outside limits; NA = Not analyzed.

APPENDIX D-3C
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - PESTICIDES/PCBs (ug/kg)

Field sample ID	SYTEX-1MSD	EYT34-1	EYT35-1	EYT36-1	EYT37-1	NPT-1	NPT-2	NPT-3	NPT-4	SYTFB-1 [1]	EYTFB-1 [1]
Lab Sample ID	D1991-09MSD	D1349-01	D1349-02	D1349-03	D1349-04	D1911-01	D1911-03	D1911-02	D1911-04	D1991-08	D1349-05
Sample Location	SY UST	EY UST	EY UST	EY UST	EY UST	NP UST	NP UST	NP UST	NP UST		
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK
Date Sampled	12/4/97	8/29/97	8/29/97	8/29/97	8/29/97	11/19/97	11/19/97	11/19/97	11/19/97	12/4/97	8/29/97
Pesticides											
alpha-BHC	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	2.6 U	2.7 U	2.7 U	0.050 U	NA
beta-BHC	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	2.6 U	2.7 U	2.7 U	0.050 U	NA
delta-BHC	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	300 DJN	2.7 U	2.7 U	0.050 U	NA
gamma-BHC (Lindane)	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	2.6 U	2.7 U	2.7 U	0.050 U	NA
Heptachlor	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	2.6 U	2.7 U	2.7 U	0.050 U	NA
Aldrin	380 P	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	350 DJN	350 JN	2.7 U	0.050 U	NA
Heptachlor Epoxide	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	2.6 U	2.7 U	2.7 U	0.050 U	NA
Endosulfan I	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	2.6 U	2.7 U	2.7 U	0.050 U	NA
Dieldrin	100 U	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	5.1 U	5.3 U	5.2 U	0.10 U	NA
4,4'-DDE	120	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	130 DJN	110 JN	5.2 U	0.10 U	NA
Endrin	100 U	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	73 JN	180 JN	5.2 U	0.10 U	NA
Endosulfan II	100 U	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	5.1 U	5.3 U	5.2 U	0.10 U	NA
4,4'-DDD	100 U	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	30 JN	5.3 U	5.2 U	0.10 U	NA
Endosulfan Sulfate	100 U	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	24	5.3 U	5.2 U	0.10 U	NA
4,4'-DDT	140 P	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	55 JN	95 JN	5.2 U	0.10 U	NA
Methoxychlor	540 U	20 U	18 U	18 U	20 U	33 U	26 U	27 U	200 J	0.50 U	NA
Endrin ketone	100 U	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	5.1 U	5.3 U	5.2 U	0.10 U	NA
Endrin aldehyde	100 U	3.9 U	3.5 U	3.6 U	3.8 U	6.4 U	5.1 U	5.3 U	5.2 U	0.10 U	NA
alpha-Chlordane	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	33	77 JN	2.7 U	0.050 U	NA
gamma-Chlordane	54 U	2.0 U	1.8 U	1.8 U	2.0 U	3.3 U	120 DJN	21	2.7 U	0.050 U	NA
Toxaphene	5400 U	200 U	180 U	180 U	200 U	330 U	260 U	270 U	270 U	5.0 U	NA
PCBs											
Aroclor-1016	1000 U	39 U	35 U	36 U	38 U	64 U	51 U	53 U	52 UJ	1.0 U	NA
Aroclor-1221	2100 U	80 U	72 U	73 U	78 U	130 U	100 U	110 U	110 UJ	2.0 U	NA
Aroclor-1232	1000 U	39 U	35 U	36 U	38 U	64 U	51 U	53 U	52 UJ	1.0 U	NA
Aroclor-1242	1000 U	39 U	35 U	36 U	38 U	64 U	51 U	53 U	52 UJ	1.0 U	NA
Aroclor-1248	6800	39 U	35 U	36 U	38 U	64 U	7800 DJN	7200 JN	52 UJ	1.0 U	NA
Aroclor-1254	1000 U	39 U	35 U	36 U	38 U	64 U	51 U	53 U	52 UJ	1.0 U	NA
Aroclor-1260	1000 U	39 U	35 U	36 U	38 U	64 U	51 U	53 U	52 UJ	1.0 U	NA
Percent Solids	84%	84%	93%	92%	86%	69%	87%	84%	85%	0%	100%
Dilution Factor	100.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:

1. Field blank concentration reported in ug/L.
2. U = Not detected; J = Estimated value; R = Rejected value; D = Diluted sample; N = Presumptive evidence of presence; P = Dual column precision outside limits; NA = Not analyzed.

APPENDIX D-3D
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - INORGANICS (mg/kg)

Field sample ID	NYT-1	NYT-2	SYTN-1	SYTNX-1	SYTS-1	SYTE-1	SYTW-1	SYTC-1	SYTCX-1	SYTEX-1
Lab Sample ID	D1875-02	D1875-03	D1991-01	D1991-07	D1991-02	D1991-03	D1991-04	D1991-05	D1991-06	D1991-09
Sample Location	NY UST	NY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST	SY UST
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTN-1 DUP.	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	SYTC-1 DUP.	ENV. SAMPLE
Date Sampled	11/14/97	11/14/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97	12/4/97
Aluminum	10500	18800	NA	NA	NA	NA	NA	6440 J	8340 J	7050 J
Antimony	0.48 U	0.64 U	NA	NA	NA	NA	NA	0.67 UJ	0.65 UJ	0.59 UJ
Arsenic	2.8	5.2 J	NA	NA	NA	NA	NA	2.3	4.2	4.0 J
Barium	62.5	460	NA	NA	NA	NA	NA	82.3 J	128 J	103 J
Beryllium	0.54	0.79	NA	NA	NA	NA	NA	0.31 J	0.33 J	0.42 J
Cadmium	0.29	2.6	NA	NA	NA	NA	NA	0.60	0.87	0.91
Calcium	2260	4070	NA	NA	NA	NA	NA	20900 J	36100 J	17700 J
Chromium	62.6	88.9	NA	NA	NA	NA	NA	35.3	52.0	39.2
Cobalt	14.7	22.8	NA	NA	NA	NA	NA	7.7 J	9.4 J	7.4 J
Copper	28.5	127	NA	NA	NA	NA	NA	55.5 J	70.3 J	65.2 J
Iron	24400	32800	NA	NA	NA	NA	NA	14200	19700	16700
Lead	28.0	410	NA	NA	NA	NA	NA	44.8	93.9	74.3
Magnesium	10100	10900	NA	NA	NA	NA	NA	5760 J	7340 J	3840 J
Manganese	297	486	NA	NA	NA	NA	NA	158 J	248 J	197 J
Mercury	0.04 U	4.2	NA	NA	NA	NA	NA	4.1 J	2.4 J	2.6 J
Nickel	135	94.1	NA	NA	NA	NA	NA	101 J	104 J	55.6 J
Potassium	1700	8120 J	NA	NA	NA	NA	NA	3300 J	4140 J	2950 J
Selenium	0.81	1.1	NA	NA	NA	NA	NA	1.1 UJ	1.1 UJ	0.98 UJ
Silver	0.32 UJ	0.43 UJ	NA	NA	NA	NA	NA	0.44 UJ	0.43 UJ	0.39 UJ
Sodium	123	452	NA	NA	NA	NA	NA	295	284	220
Thallium	0.73	0.89	NA	NA	NA	NA	NA	0.44 U	0.60	0.41
Vanadium	37.3	67.6	NA	NA	NA	NA	NA	21.2 J	29.1 J	22.5 J
Zinc	71.4	912	NA	NA	NA	NA	NA	169 J	370 J	234 J
Cyanide	1.1 U	0.96 U	NA	NA	NA	NA	NA	1.0	1.4	1.4
Percent Solids	84%	80%						77%	85%	84%
Level	Medium	Medium						Medium	Medium	Medium

Notes:
1. Field blank concentrations reported in ug/L.
2. U = Not detected; J = Estimated value; NA = Not analyzed.

APPENDIX D-3D
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - INORGANICS (mg/kg)

Field sample ID	EYT34-1	EYT35-1	EYT36-1	EYT37-1	NPT-1	NPT-2	NPT-3	NPT-4	SYTFB-1 [1]	EYTFB-1 [1]
Lab Sample ID	*D1349-01*	*D1349-02*	*D1349-03*	*D1349-04*	*D1911-01*	*D1911-03*	*D1911-02*	*D1911-04*	*D1991-08*	*D1349-05*
Sample Location	EY UST	EY UST	EY UST	EY UST	NP UST	NP UST	NP UST	NP UST		
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK	FIELD BLANK
Date Sampled	8/29/97	8/29/97	8/29/97	8/29/97	11/19/97	11/19/97	11/19/97	11/19/97	12/4/97	8/29/97
Aluminum	701 J	791 J	620 J	829 J	16800	14800	16700	18000	42.3	NA
Antimony	0.58 U	0.58 U	0.59 U	0.52 U	0.66 U	0.53 U	0.64 U	0.52 U	3.0 U	NA
Arsenic	1.7	0.70	0.39 U	0.56	4.5	3.4	4.4	3.1	2.0 U	NA
Barium	5.1 J	5.5 J	3.9 J	5.0 J	208	152	192	147	8.0	NA
Beryllium	0.19 U	0.19 U	0.20 U	0.17 U	0.49	0.50	0.55	0.66	1.0 U	NA
Cadmium	0.12 U	0.12 U	0.12 U	0.10 U	0.13 U	0.11 U	0.13 U	0.10 U	0.60 U	NA
Calcium	135 J	2840 J	786 J	109 J	3980	3090	4540	684	37.3	NA
Chromium	3.8 J	2.8 J	2.0 J	2.9 J	56.6	49.0	63.0	48.3	0.50 U	NA
Cobalt	1.1	1.1	10.7 J	1.2	17.1	13.0	13.7	10.7	1.1	NA
Copper	2.5	3.1	4.3	2.3	36.1 J	95.3 J	44.6 J	31.8 J	12.5	NA
Iron	4770 J	2450 J	3190 J	3350 J	27300	25000	26100	23000	44.4	NA
Lead	1.5	3.3	2.8	1.4	44.4 J	8.5 J	49.4 J	16.1 J	2.0 U	NA
Magnesium	253 J	513 J	266 J	296 J	9050	6180	9270	7240	9.0 U	NA
Manganese	39.9 J	50.3 J	48.4 J	56.9 J	306	207	276	238	3.1	NA
Mercury	0.27	0.56	0.04 U	0.07	0.78	0.87	0.69	0.03 U	0.07 U	NA
Nickel	2.6	2.6	2.6	2.6	42.6	42.3	38.5	28.1	3.0 U	NA
Potassium	252 U	454	280	226 U	9170 J	7290 J	8130 J	7760 J	1300 U	NA
Selenium	0.97 U	0.96 U	0.98 U	0.87 U	1.1 U	0.89 U	1.1 U	0.87 U	5.0 UJ	NA
Silver	0.43 UJ	0.33 UJ	0.37 UJ	0.41 UJ	0.44 UJ	0.36 UJ	0.43 UJ	0.35 UJ	2.0 UJ	NA
Sodium	130	192	125	112	894	1360	842	209	300 U	NA
Thallium	0.39 U	0.38 U	0.39 U	0.35 U	1.0	1.0	0.93	0.96	2.0 U	NA
Vanadium	4.7 J	3.1 J	2.6 J	3.5 J	50.7	42.5	54.4	56.1	1.0 U	NA
Zinc	5.9 J	43.8 J	72.4 J	8.2 J	118	74.3	102	63.5	18.5	NA
Cyanide	0.24 U	0.21 U	0.22 U	0.23 U	1.2 U	1.1 U	1.0 U	1.0 U	2.0 U	NA
Percent Solids	84%	93%	92%	86%	69%	87%	84%	85%	0%	
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	

Notes:
1. Field blank concentrations reported in ug/L.
2. U = Not detected; J = Estimated value; NA = Not analyzed.

APPENDIX D-3E
HEXAGON LABORATORIES RI/FFS
SUBSURFACE UST ANALYTICAL DATA - TOTAL ORGANIC CARBON (mg/kg)

Field sample ID	NYT-1	SYTEX-1	EYT36-1	NPT-1
Lab Sample ID	D1875-02	D1991-09	D1349-03	D1911-01
Sample Location	NY UST	SY UST	EY UST	NP UST
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE
Date Sampled	11/14/97	12/4/97	8/29/97	11/19/97
TOC	8760	23100	620	2180

APPENDIX D-4A
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - VOLATILE ORGANICS (ug/L)

Field sample ID	HXMW1		HXMW2		HXMW3		HXMW53		HXMW4	
Lab Sample ID	E0001-01	E0299-01	E0001-02	E0299-02	E0001-03	E0299-03	E0001-06	E0299-04	E0001-04	E0001-04MS
Sample Location	EAST YARD (S)	EAST YARD (S)	EAST YARD (D)	EAST YARD (D)	SOUTH YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD	NEW PLANT	NEW PLANT
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXMW3 DUP.	HXMW3 DUP.	ENV. SAMPLE	MS
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	1/2/98
Aromatics										
Benzene	94	260 J	280	230 DJ	3600	1100 DJ	3900	2000 DJ	4000 J	320000
Toluene	2 J	100 UJ	8 J	1 J	8800	120 DJ	9600	190 J	280000	570000
Ethylbenzene	3 J	11 J	90	100 J	150 J	140 J	150 J	140 J	5200 J	5300 J
Xylene(total)	3 J	100 UJ	360	130 J	1000	320 DJ	1000	600 DJ	26000 J	28000 J
Styrene	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
Halogenated Aliphatics										
Chloromethane	25 UJ	100 UJ	50 UJ	10 UJ	1000 UJ	10 UJ	1000 UJ	10 UJ	50000 UJ	50000 U
Bromomethane	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
Vinyl Chloride	25 U	100 UJ	50 U	10 UJ	780 J	160 DJ	580 J	250 DJ	50000 U	50000 U
Chloroethane	63	250 J	180	130 DJ	1000 U	16	1000 U	14 J	50000 U	50000 U
Methylene Chloride	25 UJ	100 UJ	50 UJ	3 J	120 J	6 J	120 J	6 J	15000 J	14000 J
1,1-Dichloroethene	25 U	100 UJ	50 U	10 UJ	1000 U	31 J	1000 U	25 J	50000 U	290000
1,1-Dichloroethane	25 U	100 UJ	5 J	24 J	330 J	150 DJ	370 J	290 DJ	36000 J	37000 J
1,2-Dichloroethene (total)	25 UJ	100 UJ	50 UJ	10 UJ	4300 J	1200 DJ	2500 J	2000 DJ	8800 J	9300 J
Chloroform	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
1,2-Dichloroethane	25 U	100 UJ	50 U	10 UJ	1800	590 DJ	2000	1100 DJ	440000	460000
1,1,1-Trichloroethane	25 U	100 UJ	50 U	2 J	1000 U	2 J	1000 U	2 J	50000 U	50000 U
Carbon Tetrachloride	25 UJ	100 UJ	50 UJ	10 UJ	1000 UJ	10 UJ	1000 UJ	10 UJ	50000 UJ	50000 U
Bromodichloromethane	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
1,2-Dichloropropane	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	4 J	50000 U	50000 U
cis-1,3-Dichloropropene	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
Trichloroethene	25 U	100 UJ	50 U	1 J	280 J	260 DJ	160 J	400 DJ	19000 J	330000
Dibromochloromethane	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
1,1,2-Trichloroethane	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
trans-1,3-Dichloropropene	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
Bromoform	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
Tetrachloroethene	25 U	100 UJ	50 U	10 UJ	280 J	730 DJ	150 J	1100 DJ	10000 J	11000 J
1,1,2,2-Tetrachloroethane	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
Ketones										
Acetone	30	100 UJ	15 J	4 J	14000	270 DJ	14000	390 DJ	24000 J	25000 J
2-Butanone	25 U	100 UJ	50 U	10 UJ	1000 U	10 UJ	1000 U	10 UJ	50000 U	50000 U
4-Methyl-2-pentanone	25 U	100 UJ	50 U	10 UJ	1000 U	17 J	1000 U	17 J	50000 U	50000 U
2-Hexanone	25 U	100 UJ	50 U	3 J	1000 U	37 J	1000 U	39 J	50000 U	50000 U
Other/Miscellaneous VOCs										
Carbon disulfide	25 UJ	100 UJ	50 UJ	10 UJ	1000 UJ	10 UJ	1000 UJ	10 UJ	50000 UJ	50000 U
Chlorobenzene	270	830 J	450	460 DJ	1200	360 DJ	1200	690 DJ	3900 J	300000
Totat Target VOCs	465 J	1351 J	1388 J	1088 J	36640 J	5509 J	35730 J	9257 J	871900 J	2399600 J
Number of VOC TICs	5	0	6	16	1	20	0	19	1	
Total VOC TIC Concentration	486 J		496 J	327 J	700 J	515 J		557 J	48000 J	
Dilution Factor	2.5	10.0	5.0	1.0	100.0	1.0	100.0	1.0	5000.0	5000.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. U = Not detected; J = Estimated value; D = Diluted sample; N = Presumptive evidence of presence.

APPENDIX D-4A
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - VOLATILE ORGANICS (ug/L)

Field sample ID	HXMW4		HXMW5		HXMW6				FBMW-1	TRIP BLANK
Lab Sample ID	E0001-04MSD	E0299-06	E0001-05	E0299-07	E0221-01	E0299-05	E0299-05MS	E0299-05MSD	E0001-07	E0001-08
Sample Location	NEW PLANT	NEW PLANT	OLD PLANT	OLD PLANT	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.		
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	FIELD BLANK	TRIP BLANK
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	2/18/98	3/5/98	3/5/98	3/5/98	1/2/98	1/2/98
Aromatics										
Benzene	340000	3100 J	5000 U	130 J	10 U	2 J	61	59	10 U	10 U
Toluene	590000	290000 DJ	38000	42000 DJ	10 U	10 UJ	56	54	10 U	10 U
Ethylbenzene	5200 J	3700 J	880 J	980 J	10 U	10 UJ	10 U	10 U	10 U	10 U
Xylene(total)	27000 J	19000 J	3900 J	4200 J	10 U	10 UJ	10 U	10 U	10 U	10 U
Styrene	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Halogenated Aliphatics										
Chloromethane	50000 U	10000 UJ	5000 UJ	1000 UJ	10 U	10 UJ	10 U	10 U	10 UJ	10 UJ
Bromomethane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Vinyl Chloride	50000 U	1200 J	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Chloroethane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Methylene Chloride	16000 J	7700 J	5000 UJ	1000 UJ	10 U	10 UJ	10 U	10 U	10 UJ	10 UJ
1,1-Dichloroethene	310000	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	62	58	10 U	10 U
1,1-Dichloroethane	38000 J	34000 J	5000 U	1000 UJ	0.9 J	3 J	2 J	2 J	10 U	10 U
1,2-Dichloroethene (total)	9800 J	6200 J	5000 UJ	1000 UJ	2 J	8 J	7 J	7 J	10 UJ	10 UJ
Chloroform	50000 U	10000 UJ	5000 U	1000 UJ	2 J	2 J	2 J	2 J	10 U	10 U
1,2-Dichloroethane	480000	330000 DJ	5000 U	140 J	3 J	8 J	8 J	8 J	10 U	10 U
1,1,1-Trichloroethane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Carbon Tetrachloride	50000 U	10000 UJ	5000 UJ	1000 UJ	10 U	10 UJ	10 U	10 U	10 UJ	10 UJ
Bromodichloromethane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
1,2-Dichloropropane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Trichloroethene	350000	17000 J	5000 U	1000 UJ	9 J	26 J	79	76	10 U	10 U
Dibromochloromethane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Bromoform	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Tetrachloroethene	11000 J	9500 J	5000 U	1000 UJ	10 U	1 J	1 J	1 J	10 U	10 U
1,1,2,2-Tetrachloroethane	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Ketones										
Acetone	33000 J	10000 J	11000	4200 J	10 U	10 UJ	10 U	10 U	10 U	10 U
2-Butanone	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
2-Hexanone	50000 U	10000 UJ	5000 U	1000 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U
Other/Miscellaneous VOCs										
Carbon disulfide	50000 U	10000 UJ	5000 UJ	1000 UJ	10 U	10 UJ	10 U	10 U	10 UJ	10 UJ
Chlorobenzene	320000	3100 J	5000 U	210 J	2 NJ	4 J	54	53	10 U	10 U
Total Target VOCs	2530000 J	734500 J	53780 J	51860 J	18 J	54 J	332 J	320 J	0 J	0 J
Number of VOC TICs		0	0	0	3	3			0	1
Total VOC TIC Concentration					57 J	143 J				9 J
Dilution Factor	5000.0	1000.0	500.0	100.0	1.0	1.0	1.0	1.0	1.0	1.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. U = Not detected; J = Estimated value; D = Diluted sample; N = Presumptive evidence of presence.

APPENDIX D-4B
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/L)

Field sample ID	HXMW1		HXMW2		HXMW3		HXMW53		HXMW4	
Lab Sample ID	E0001-01	E0299-01	E0001-02	E0299-02	E0001-03	E0299-03	E0001-06	E0299-04	E0001-04	E0001-04MS
Sample Location	EAST YARD (S)	EAST YARD (S)	EAST YARD (D)	EAST YARD (D)	SOUTH YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD	NEW PLANT	NEW PLANT
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXMW3 DUP.	HXMW3 DUP.	ENV. SAMPLE	MS
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	1/2/98
Phenols/Acid Extractables										
Phenol	R	5 J	10 U	41	600 D	430 D	640 D	430 D	3800	3400
2-Chlorophenol	10 U	3 J	10 U	10 U	R	10 U	10 U	10 U	500 U	85 J
2-Methylphenol (o-cresol)	10 U	10 U	10 U	10 U	R	220 DJ	R	230 DJ	500 U	500 U
4- Methylphenol	10 U	10 U	10 U	10 U	290 DJN	210 DJ	490 DJN	240 DJ	9900 D	5000 E
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	18	10 U	16	500 U	500 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
2,4,5-Trichlorophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	1200 U	1200 U
2,4-Dinitrophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	1200 U	1200 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
4-Nitrophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	1200 U	1200 U
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	1200 U	1200 U
Pentachlorophenol	25 U	25 UJ	25 U	25 UJ	25 U	25 UJ	25 U	25 UJ	1200 U	1200 U
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	10 U	10 U	10 U	3 J	44	19	52	18	500 U	500 U
2-Methylnaphthalene	10 U	10 U	10 U	10 U	17	10	18	11	500 U	500 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Acenaphthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Fluorene	10 U	10 U	10 U	10 U	1 J	10 U	10 U	10 U	500 U	500 U
Phenanthrene	10 U	10 U	10 U	10 U	1 J	2 J	1 J	1 J	500 U	500 U
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	500 U	500 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	500 U	500 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	500 U	500 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	500 U	500 U
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	500 U	500 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	500 U	500 U
Aniline Compounds										
4-Chloroaniline	10 U	10 U	10 U	10 U	R	10 U	10 U	10 U	500 U	500 U
2-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	1200 U	1200 U
3-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	1200 U	1200 U
4-Nitroaniline	25 U	R	25 U	R	25 U	R	25 U	R	1200 U	1200 U

APPENDIX D-4B
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/L)

Field sample ID	HXMW1		HXMW2		HXMW3		HXMW53		HXMW4	
Lab Sample ID	E0001-01	E0299-01	E0001-02	E0299-02	E0001-03	E0299-03	E0001-06	E0299-04	E0001-04	E0001-04MS
Sample Location	EAST YARD (S)	EAST YARD (S)	EAST YARD (D)	EAST YARD (D)	SOUTH YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD	NEW PLANT	NEW PLANT
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXMW3 DUP.	HXMW3 DUP.	ENV. SAMPLE	MS
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	1/2/98
Benzenes/Aromatics										
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	54 J
1,2-Dichlorobenzene	2 J	11	10 U	6 J	72	49	74	53	320 J	290 J
Nitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	79 J
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Phthalates										
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Diethylphthalate	10 U	10 U	10 U	1 J	1 J	10 U	10 U	10 U	84 J	68 J
Di-n-butyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Butylbenzyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	14 U	1 J	73 U	1 J	500 U	92 BJ
Di-n-octyl phthalate	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	500 U	500 U
Other/Miscellaneous SVOCs										
bis(2-choroethyl)Ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
2,2'-oxybis(1-chloropropane)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
N-Nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Carbazole	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	500 U	500 U
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
bis(2-chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
4-Chlorophenyl-phenyl ether	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	500 U	500 U
N-nitrosodiphenylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
4-Bromophenyl-phenyl ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U
Total Target SVOCs	2 J	19 J	0 J	52 J	1,026 J	959 J	1,275 J	1,000 J	14,104 J	9,068 J
Number of SVOC TICs	23	8	1	3	15	8	15	8	8	
Total SVOC TIC Concentration	383 J	322 J	2 J	478 J	664 J	313 J	911 J	424 J	38,590 J	
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10.0	10.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; E = Exceeds instrument calibration range; B = Detected in blank.

APPENDIX D-4B
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/L)

Field sample ID	HXMW4		HXMW5		HXMW6				FBMW-1
Lab Sample ID	E0001-04MSD	E0299-06	E0001-05	E0299-07	E0221-01	E0299-05	E0299-05	E0299-05	E0001-07
Sample Location	NEW PLANT	NEW PLANT	OLD PLANT	OLD PLANT	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	FIELD BLANK
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	2/18/98	3/5/98	3/5/98	3/5/98	1/2/98
Phenols/Acid Extractables									
Phenol	3700	3700 D	1600 D	1000 D	10 U	10 U	56	56	10 U
2-Chlorophenol	83 J	200 U	10 U	10 U	10 U	10 U	54	54	10 U
2-Methylphenol (o-cresol)	500 U	1200	550 D	660 DJ	10 U	10 U	10 U	10 U	10 U
4- Methylphenol	5700 E	9900 D	2000 D	1000 D	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	500 U	200 U	40	33	10 U	3 J	3 J	3 J	10 U
2,4-Dichlorophenol	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	500 U	200 U	10 U	10 U	10 U	10 U	68	67	10 U
2,4,6-Trichlorophenol	500 U	200 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	1200 U	500 UJ	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2,4-Dinitrophenol	1200 U	500 UJ	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2-Nitrophenol	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	1200 U	500 UJ	25 U	25 U	25 U	25 U	82 E	83 E	25 U
4,6-Dinitro-2-methylphenol	1200 U	500 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Pentachlorophenol	1200 U	500 UJ	25 U	25 UJ	25 U	25 UJ	72	75	25 U
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	500 U	430	1 JN	1 J	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	54 J	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	500 U	200 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	500 U	200 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthene	500 U	200 UJ	10 U	10 U	10 U	10 U	45	44	10 U
Fluorene	500 U	200 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	500 U	200 U	10 U	10 U	10 U	10 U	37	35	10 U
Benzo(a)anthracene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	500 U	200 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	500 U	200 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	500 U	200 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	500 U	200 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	500 U	200 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	500 U	200 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Aniline Compounds									
4-Chloroaniline	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	1200 U	500 UJ	25 U	25 U	25 U	25 U	25 U	25 U	25 U
3-Nitroaniline	1200 U	500 UJ	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4-Nitroaniline	1200 U	R	25 U	R	25 U	R	25 U	25 U	25 U

APPENDIX D-4B
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/L)

Field sample ID	HXMW4		HXMW5		HXMW6				FBMW-1
Lab Sample ID	E0001-04MSD	E0299-06	E0001-05	E0299-07	E0221-01	E0299-05	E0299-05	E0299-05	E0001-07
Sample Location	NEW PLANT	NEW PLANT	OLD PLANT	OLD PLANT	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	FIELD BLANK
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	2/18/98	3/5/98	3/5/98	3/5/98	1/2/98
Benzenes/Aromatics									
1,3-Dichlorobenzene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	72 J	200 U	10 U	10 U	10 U	10 U	28	30	10 U
1,2-Dichlorobenzene	310 J	290	16	14	6 J	11	10	10	10 U
Nitrobenzene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	500 U	200 U	10 U	10 U	10 U	10 U	39	38	10 U
2,6-Dinitrotoluene	500 U	200 UJ	10 U	10 U	10 U	10 U	10 U	1 J	10 U
2,4-Dinitrotoluene	79 J	200 UJ	10 U	10 U	10 U	10 U	56	52	10 U
Hexachlorobenzene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phthalates									
Dimethylphthalate	150 J	270 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	79 J	130 J	3 JN	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzyl phthalate	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	500 U	200 U	48 U	2 J	10 U	10 U	10 U	10 U	58
Di-n-octyl phthalate	500 U	200 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Other/Miscellaneous SVOCs									
bis(2-choroethyl)Ether	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-chloropropane)	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	500 U	200 U	10 U	10 U	10 U	10 U	45	44	10 U
Hexachloroethane	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	500 U	200 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	500 U	200 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenyl ether	500 U	200 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U
N-nitrosodiphenylamine	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenyl ether	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	500 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Target SVOCs	10,227 J	15,920	4,210 J	2,710 J	6 J	14 J	595 J	592	58
Number of SVOC TICs		10	17	17	26	18			0
Total SVOC TIC Concentration		64,300 J	1,064 J	1,862 J	152 J	103 J			
Dilution Factor	10.0	20.0	1.0	1.0	1	1	1	1	1.0
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. U = Not detected; J = Estimated value; R = Rejected value; N = Presumptive evidence of presence; D = Diluted sample; E = Exceeds instrument calibration range; B = Detected in blank.

APPENDIX D-4C
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - PESTICIDES/PCBs (ug/L)

Field sample ID	HXMW1		HXMW2		HXMW3		HXMW53		HXMW4	
Lab Sample ID	E0001-01	E0299-01	E0001-02	E0299-02	E0001-03	E0299-03	E0001-06	E0299-04	E0001-04	E0001-04MS
Sample Location	EAST YARD (S)	EAST YARD (S)	EAST YARD (D)	EAST YARD (D)	SOUTH YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD	NEW PLANT	NEW PLANT
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXMW3 DUP.	HXMW3 DUP.	ENV. SAMPLE	MS
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	1/2/98
Pesticides										
alpha-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.46 JN	0.43 P
delta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	R	0.71 P
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.35 P
Heptachlor	0.050 U	0.050 U	0.050 U	0.050 U	0.12 JN	0.050 U	R	0.050 U	1.9 DJ	1.8 E
Aldrin	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	R	1.0 EP
Heptachlor Epoxide	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	R	0.23 P
Dieldrin	0.10 U	0.10 U	R	R	0.26 JN	0.17 J	R	0.24	0.10 U	1.7 EP
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 JN	0.37 P
Endrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.48 JN	1.3 P
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	R	0.11 P
Endosulfan Sulfate	0.10 U	R	R	R	0.10 U	0.10 U	0.10 U	R	R	0.10 U
4,4'-DDT	0.10 U	0.21 J	0.29	0.33	0.10 U	0.10 U	0.10 U	0.10 U	R	1.4 P
Methoxychlor	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	0.050 JN	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.20 J	0.32 P
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
PCBs										
Aroclor-1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	13 J	15 P
Aroclor-1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:

1. U = Not detected; J = Estimated value; R = Rejected value; D = Diluted sample; E = Exceeds instrument calibration range; N = Presumptive evidence of presence; P = Dual column precision outside limits.

APPENDIX D-4C
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - PESTICIDES/PCBs (ug/L)

Field sample ID	HXMW4		HXMW5		HXMW6				FBMW-1
Lab Sample ID	E0001-04MSD	E0299-06	E0001-05	E0299-07	E0221-01	E0299-05	E0299-05	E0299-05	E0001-07
Sample Location	NEW PLANT	NEW PLANT	OLD PLANT	OLD PLANT	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	
Sample Description	MSD	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	MS	MSD	FIELD BLANK
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	2/18/98	3/5/98	3/5/98	3/5/98	1/2/98
Pesticides									
alpha-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.37 P	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	0.85 EP	R	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.29 P	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.49	0.55	0.050 U
Heptachlor	1.9 E	1.2 J	0.050 U	0.050 U	0.050 U	0.050 U	0.42	0.45	0.050 U
Aldrin	1.1 EP	R	0.050 U	0.050 U	0.050 U	0.050 U	0.38	0.39	0.050 U
Heptachlor Epoxide	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.20 P	R	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	1.0 P	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0	1.1	0.10 U
4,4'-DDE	0.35 P	R	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	1.3 P	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	1.1	1.2	0.10 U
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.12 P	R	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan Sulfate	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	1.2 P	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 P	1.1 P	0.10 U
Methoxychlor	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	R	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.28 P	R	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
PCBs									
Aroclor-1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248	18 P	17	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:

1. U = Not detected; J = Estimated value; R = Rejected value; D = Diluted sample; E = Exceeds instrument calibration range; N = Presumptive evidence of presence; P = Dual column precision outside limits.

APPENDIX D-4D
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - INORGANICS (ug/L)

Field sample ID	HXMW1				HXMW2				HXMW3			
Lab Sample ID	E0001-01	E0291-01	E0299-01	E0522-01	E0001-02	E0291-02	E0299-02	E0522-02	E0001-03	E0291-03	E0299-03	E0522-03
Sample Location	EAST YARD (S)	EAST YARD (S)	EAST YARD (S)	EAST YARD (S)	EAST YARD (D)	EAST YARD (D)	EAST YARD (D)	EAST YARD (D)	SOUTH YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Description	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED
Date Sampled	1/2/98	1/2/98	3/5/98	3/5/98	1/2/98	1/2/98	3/5/98	3/5/98	1/2/98	1/2/98	3/5/98	3/5/98
Aluminum	81600	10.0 U	26700 J	10.0 U	699	17.6	409 J	10.0 U	2960	123 J	13400 J	10.0 U
Antimony	3.0 U	8.7	4.5	2.2	3.0 U	6.8	2.8	2.0 U	3.0 U	5.9	3.9	2.3
Arsenic	18.3	10.8	8.5	5.0 J	6.4	11.2	2.9	3.8 J	6.3	11.1	11.4	10.9 J
Barium	860	148 J	291 J	34.7 J	395	323 J	343 J	282 J	90.1	43.0 J	188 J	20.4 J
Beryllium	3.8	0.50 U	1.8	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Cadmium	5.9	1.0 U	5.0 J	1.0 U	0.60 U	1.0 J	1.0 UJ	1.0 U	0.60 U	1.0 U	1.5 J	1.0 U
Calcium	87900	78600	22600	21400	38500	45900	34900	38300	72000	74200	67600	49700
Chromium	320	1.4	106 J	2.6	3.9	2.5	3.2	2.3	13.8	4.1	49.1 J	4.5
Cobalt	80.2	5.7	25.7 J	1.6	1.9	1.1	1.1	0.78	6.5	3.4	16.1 J	2.6
Copper	383	14.2 J	128 J	1.0 U	5.4	14.1 J	3.5	1.0 U	16.6	10.7 J	55.8 J	1.0 U
Iron	115000	1310 J	R	757 J	12800	10300 J	R	12600 J	12900	5370 J	R	2250 J
Lead	269	2.0 U	94.9	2.0 U	2.8	2.0 U	5.1	2.0 U	7.5	2.0 U	27.2	2.0 U
Magnesium	41200	9360 J	14400	4370	21600	24000 J	17000	18800	9230	9020 J	10800	6120
Manganese	1460	366 J	R	103	934	1060 J	R	1400	616	566 J	R	453
Mercury	R	NA	0.58 J	0.26 UJ	R	NA	0.27 UJ	0.26 UJ	R	NA	0.27 UJ	0.26 UJ
Nickel	336	37.3 J	109 J	15.5 J	12.4	10.7 J	8.8	7.5	27.7	25.4 J	52.3 J	27.3 J
Potassium	57900 J	28900	4000 UJ	42200	31900 J	35200	31800 J	33100	39800 J	38400	39900 J	31900
Selenium	5.1 J	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.1 U	5.0 UJ	5.0 U	5.0 U	5.0 U
Silver	2.0 U	11.7 J	6.4 J	11.2 J	2.0 U	8.4 J	3.2 J	9.2 J	2.0 U	5.4 J	4.3 J	6.5 J
Sodium	103000 J	121000	292000	301000	139000 J	171000	135000	155000	383000 J	450000	285000	342000
Thallium	19.0	3.0 U	4.2	3.0 U	2.0 U	3.0 U	3.0 U	3.0 U	2.7	3.0 U	3.0 U	3.0 U
Vanadium	203	4.7	62.1	4.0	17.7	5.7	3.0 U	3.2	17.7	5.8	32.9	5.3
Zinc	3300	866 J	1270	158 J	18.4	44.0 J	10.3 J	30.0 J	45.1	26.2	134	6.2 J
Cyanide	2.0 U	NA	1.5	NA	2.0 U	NA	1.8	NA	2.0 U	NA	1.4	NA
Percent Solids	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. U = Not detected; J = Estimated value; R = Rejected value; NA = Not analyzed.

APPENDIX D-4D
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - INORGANICS (ug/L)

Field sample ID	HXMW53				HXMW4				HXMW5	
Lab Sample ID	E0001-06	E0291-06	E0299-04	E0522-04	E0001-04	E0291-04	E0299-06	E0522-06	E0001-05	E0291-05
Sample Location	SOUTH YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD	NEW PLANT	NEW PLANT	NEW PLANT	NEW PLANT	OLD PLANT	OLD PLANT
Sample Description	HXMW3 DUP.	FILTERED	HXMW3 DUP.	FILTERED	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED
Date Sampled	1/2/98	1/2/98	3/5/98	3/5/98	1/2/98	1/2/98	3/5/98	3/5/98	1/2/98	1/2/98
Aluminum	4580	10.0 U	10500 J	10.0 U	23100	497 J	57300 J	510	2060	10.0 U
Antimony	3.0 U	2.3	7.1	3.0	5.6	12.9	3.9	7.9	3.0 U	3.2
Arsenic	5.0	6.8	11.2	8.4 J	11.2	12.6	18.1	7.2 J	2.8	7.9
Barium	92.4	38.2 J	152 J	18.4 J	353	29.8 J	775 J	22.0 J	63.2	24.7 J
Beryllium	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	3.0	0.50 U	1.0 U	0.50 U
Cadmium	0.60 U	1.0 U	1.4 J	1.0 U	2.1	1.0 U	7.1 J	1.0 U	0.60 U	1.0 U
Calcium	65700	67700	60700	42400	102000	104000	130000	133000	44800	45300
Chromium	17.2	3.4	40.0 J	4.0	424	221 J	560 J	200	160	57.7 J
Cobalt	7.8	2.9	13.3 J	2.3	28.6	11.0 J	51.1 J	8.9	6.5	3.7
Copper	25.4	6.5	47.3 J	1.0 U	923	25.9 J	2080 J	10.4	42.0	9.3
Iron	12900	3230 J	R	1890 J	38900	5920 J	R	8970 J	19900	5440 J
Lead	11.7	2.0 U	23.5	2.0 U	131	2.0 U	276	2.0 U	3.7	2.0 U
Magnesium	8820	7780 J	9600	5300	13500	6470 J	30800	9590	4630	4070 J
Manganese	517	443 J	R	392	801	273 J	R	464	859	765 J
Mercury	R	NA	0.27 UJ	0.26 UJ	R	NA	4.3 J	0.29 J	R	NA
Nickel	29.8	23.4 J	45.2 J	23.8 J	949	606 J	1240 J	618 J	26.5	24.0 J
Potassium	37400 J	34700	39100 J	26700	43800 J	34600	4000 UJ	34500	40200 J	41500
Selenium	12.4 J	5.0 U	5.0 U	5.7 U	5.0 UJ	5.0 U	5.0 U	5.0 U	12.3 J	5.0 U
Silver	2.0 U	2.0 UJ	4.3 J	4.3 J	2.0 U	4.7 J	5.9 J	3.4 J	2.0 U	2.0 UJ
Sodium	335000 J	388000	281000	291000	295000 J	279000	283000	318000	170000 J	196000
Thallium	2.0 U	3.0 U	3.0 U	3.0 U	7.2	3.0 U	10.2	3.0 U	2.0 U	3.0 U
Vanadium	20.7	5.9	28.0	4.7	113	48.2 J	177	38.2	14.2	3.3
Zinc	57.3	26.5	114	4.0 U	572	223 J	974	87.3 J	36.8	58.0 J
Cyanide	2.0 U	NA	0.90	NA	1150	NA	2000	NA	2.0 U	NA
Percent Solids	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Level	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. U = Not detected; J = Estimated value; R = Rejected value.

APPENDIX D-4D
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - INORGANICS (ug/L)

Field sample ID	HXMW5		HXMW6				FBMW-1	
Lab Sample ID	E0299-07	E0522-07	E0221-01	E0291-08	E0299-05	E0522-05	E0001-07	E0291-07
Sample Location	OLD PLANT	OLD PLANT	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.	BOST. POST RD.		
Sample Description	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED	ENV. SAMPLE	FILTERED	FIELD BLANK	FILTERED
Date Sampled	3/5/98	3/5/98	2/18/98	2/18/98	3/5/98	3/5/98	1/2/98	1/2/98
Aluminum	12300 J	26.1	5660	3910 J	805 J	10.0 U	30.3	10.0 U
Antimony	4.7	2.0 U	3.6	2.6	2.4	2.0 U	3.0 U	2.0 U
Arsenic	5.9	3.5 J	3.8	3.9	2.0 U	2.8 J	2.0 U	2.8
Barium	180 J	14.1 J	165 J	122 J	76.3 J	72.7 J	12.2	1.0 U
Beryllium	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U
Cadmium	1.6 J	1.0 U	1.3	1.2	1.0 UJ	1.0 U	0.60 U	1.0 U
Calcium	32900	27600	49900	47600	51100	60000	23.6	96.9
Chromium	220 J	76.2	40.6 J	36.3 J	9.5 J	2.7	0.50 U	0.60 U
Cobalt	15.8 J	2.6	13.3 J	12.3 J	6.0 J	4.4	1.0 U	0.60 U
Copper	68.9 J	1.0 U	32.1 J	35.8 J	11.0 J	4.3	3.0 U	6.7
Iron	R	8000 J	7840	5940 J	R	42.9 J	30.3	16.4
Lead	10.2	2.0 U	11.1	13.2	3.9	2.0 U	2.0 U	2.0 U
Magnesium	7370	3330	9400	8720 J	8640	9540	9.0 U	8.0 U
Manganese	R	644	545	504 J	R	511	2.8	3.7
Mercury	0.27 UJ	0.26 UJ	0.27 J	0.40	0.88 J	0.26 UJ	R	NA
Nickel	43.6 J	19.3 J	24.6 J	24.4 J	13.8 J	11.5 J	3.0 U	1.0 U
Potassium	46000 J	38200	16100	15900	13800 J	15500	1300 U	4000 U
Selenium	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U
Silver	3.0 J	2.0 UJ	5.8 J	2.0 UJ	2.3 J	3.9 J	2.0 U	2.0 UJ
Sodium	153000	178000	68800	62800	75400	87600	300 U	479
Thallium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	2.0 U	3.0 U
Vanadium	41.1	3.6	14.3	11.5	3.3	3.0 U	1.0 U	3.0 U
Zinc	98.9	67.9 J	104 J	96.7 J	36.5 J	42.5 J	6.0 U	8.2
Cyanide	2.1	NA	4.5	NA	0.50 U	NA	2.0 U	NA
Percent Solids	0%	0%	0%	0%	0%	0%	0%	0%
Level	Low	Low	Low	Low	Low	Low	Low	Low

Notes:
1. U = Not detected; J = Estimated value; R = Rejected value.

APPENDIX D-4E
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - TOC, TPHC, TDS, AND TSS (mg/L)

Field sample ID	HXMW1		HXMW2		HXMW3		HXMW53	
Lab Sample ID	E0001-01	E0299-01	E0001-02	E0299-02	E0001-03	E0299-03	E0001-06	E0299-04
Sample Location	EAST YARD (S)	EAST YARD (S)	EAST YARD (D)	EAST YARD (D)	SOUTH YARD	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	HXMW3 DUP.	HXMW3 DUP.
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98	1/2/98	3/5/98
TOC	16.6	NA	46.6	NA	2720	NA	78.4	NA
TDS	640	950 J	700	680 J	1500	1000 J	1300	1000 J
TSS	700	1200 J	26	60 J	160	210 J	140	240 J

Notes:
1. ND = Not detected; J = Estimated value; NA = Not analyzed.
2. Only total dissolved solids data and total suspended solids data from 3/5/98 sampling event are validated.

APPENDIX D-4E
HEXAGON LABORATORIES RI/FFS
GROUNDWATER ANALYTICAL DATA - TOC, TPHC, TDS, AND TSS (mg/L)

Field sample ID	HXMW4		HXMW5		HXMW6		FBMW-1
Lab Sample ID	E0001-04	E0299-06	E0001-05	E0299-07	E0221-01	E0299-05	E0001-07
Sample Location	NEW PLANT	NEW PLANT	OLD PLANT	OLD PLANT	BOST. POST RD.	BOST. POST RD.	
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	FIELD BLANK
Date Sampled	1/2/98	3/5/98	1/2/98	3/5/98	2/18/98	3/5/98	1/2/98
TOC	1010	NA	135	NA	NA	NA	ND
TDS	1300	1500 J	750	730 J	440 J	540 J	110
TSS	120	61 J	78	330 J	110 J	61 J	ND

Notes:
1. ND = Not detected; J = Estimated value; NA = Not analyzed.
2. Only total dissolved solids data and total suspended solids data from 3/5/98 sampling event are validated.

APPENDIX D-5A
HEXAGON LABORATORIES SITE RI/FFS
IRM UST EXCAVATED SOIL ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	LD1-2-3	FOT#1	FOT#2	#1-2-3	FO1	FO2	SYS1	SYS2	SYS3
Sample Location	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Interval (feet bgs)	0 - 3	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6
Date Sampled	10/8/97	11/14/97	11/14/97	12/5/97	12/22/97	12/22/97	12/22/97	12/22/97	12/22/97
Aromatics									
Benzene	6300	63000	97000	5 U	250 U	1000	250 U	250 U	NA
Toluene	1700000	500000	1800000	150	10000	260000	30000	100000	NA
Ethylbenzene	62000	10000	62000	260	1300	23000	2800	3900	NA
Xylene(total)	270000	74000	420000	1500	42000	180000	14000	20000	NA
Styrene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Halogenated Aliphatics									
Chloromethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Bromomethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Vinyl Chloride	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Chloroethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Methylene Chloride	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,1-Dichloroethene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,1-Dichloroethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,2-Dichloroethene (total)	500 U	1600	7500	5 U	250 U	500 U	250 U	250 U	NA
Chloroform	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,2-Dichloroethane	12000	12000	57300	82	600	1100	250 U	950	NA
1,1,1-Trichloroethane	500 U	1000 U	1000 U	5 U	250 U	510	250 U	250 U	NA
Carbon Tetrachloride	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Bromodichloromethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,2-Dichloropropane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Trichloroethene	15000	1000 U	3700	9	540	23000	250 U	440	NA
Dibromochloromethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,1,2-Trichloroethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Bromoform	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Tetrachloroethene	7200	1000 U	3500	120	3200	84000	450	2600	NA
1,1,2,2-Tetrachloroethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Bromochloromethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,2-Dibromo-3-Chloropropane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,2-Dibromoethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Dibromomethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Dichlorodifluoromethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,3-Dichloropropane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
2,2-Dichloropropane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,1-Dichloropropene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,1,1,2-Tetrachloroethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Trichlorofluoromethane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,2,3-Trichloropropane	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA

APPENDIX D-5A
HEXAGON LABORATORIES SITE RI/FFS
IRM UST EXCAVATED SOIL ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	LD1-2-3	FOT#1	FOT#2	#1-2-3	FO1	FO2	SYS1	SYS2	SYS3
Sample Location	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Interval (feet bgs)	0 - 3	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6
Date Sampled	10/8/97	11/14/97	11/14/97	12/5/97	12/22/97	12/22/97	12/22/97	12/22/97	12/22/97
Ketones									
Acetone	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
2-Butanone	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
2-Hexanone	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Other/Miscellaneous VOCs									
Carbon disulfide	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Chlorobenzene	72000	1000 U	1000 U	240	250 U	5800	2500	7100	NA
1,2-Dichlorobenzene	500 U	1000 U	1000 U	39	6800	20000	560	250 U	NA
1,3-Dichlorobenzene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,4-Dichlorobenzene	2400	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Bromobenzene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
n-Butylbenzene	500 U	3300	4600	5 U	250 U	500 U	250 U	250 U	NA
sec-Butylbenzene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
tert-Butylbenzene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
2-Chlorotoluene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
4-Chlorotoluene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Hexachlorobutadiene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
Isopropylbenzene	82000	2300	7000	220	1900	17000	7600	700	NA
p-Isopropyltoluene	500 U	3100	4800	5 U	790	1100	250 U	250 U	NA
Naphthalene	570	8300	13000	34	1700	1700	290	310	NA
n-Propylbenzene	500 U	4000	6300	6	270	670	250 U	250 U	NA
1,2,3-Trichlorobenzene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,2,4-Trichlorobenzene	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
1,3,5-Trimethylbenzene	1500	20000	32000	6	1400	2400	250 U	350	NA
1,2,4-Trimethylbenzene	500 U	29000	37000	7	2200	1700	250 U	290	NA
Vinyl Acetate	500 U	1000 U	1000 U	5 U	250 U	500 U	250 U	250 U	NA
TOTAL TCL VOCs	2144500	660600	2451000	2361	57640	578410	49750	134990	
TOTAL OTHER VOCs	86470	70000	104700	312	15060	44570	8450	1650	
TOTAL TARGET VOCs	2230970	730600	2555700	2673	72700	622980	58200	136640	

Notes:
1. Analytical data are not validated.
2. U = Not detected; NA = Not analyzed.

APPENDIX D-5B
HEXAGON LABORATORIES RI/FFS
IRM UST EXCAVATED SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	LD1-2-3	FOT#1	FOT#2	#1-2-3	FO1	FO2	SYS1	SYS2	SYS3
Sample Location	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Interval (feet bgs)	0 - 3	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6
Date Sampled	10/8/97	11/14/97	11/14/97	12/5/97	12/22/97	12/22/97	12/22/97	12/22/97	12/22/97
Phenols/Acid Extractables									
Phenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2-Chlorophenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2-Methylphenol (o-cresol)	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
4- Methylphenol	2900	22000	23000	670 U	NA	NA	NA	NA	NA
2,4-Dimethylphenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2,4-Dichlorophenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2,4-Dinitrophenol	1300 U	40000 U	40000 U	1330 U	NA	NA	NA	NA	NA
2-Nitrophenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
4-Nitrophenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Pentachlorophenol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	330 U	9900 U	9900 U	510	NA	NA	NA	NA	NA
2-Methylnaphthalene	670 U	33000	22000	1500	NA	NA	NA	NA	NA
2-Chloronaphthalene	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Acenaphthylene	400 U	12000 U	12000 U	400 U	NA	NA	NA	NA	NA
Acenaphthene	330 U	10000 U	10000 U	330 U	NA	NA	NA	NA	NA
Fluorene	330 U	10000 U	10000 U	380	NA	NA	NA	NA	NA
Phenanthrene	330 U	10000 U	10000 U	1500	NA	NA	NA	NA	NA
Anthracene	330 U	10000 U	10000 U	360	NA	NA	NA	NA	NA
Fluoranthene	330 U	10000 U	10000 U	330 U	NA	NA	NA	NA	NA
Pyrene	330 U	10000 U	10000 U	330 U	NA	NA	NA	NA	NA
Benzo(a)anthracene	330 U	10000 U	10000 U	330 U	NA	NA	NA	NA	NA
Chrysene	40 U	1200 U	1200 U	720	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40 U	1200 U	1200 U	150	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	40 U	1200 U	1200 U	100 U	NA	NA	NA	NA	NA
Benzo(a)pyrene	40 U	1200 U	1200 U	50	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40 U	1200 U	1200 U	80	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	40 U	1200 U	1200 U	70	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	40 U	1200 U	1200 U	100 U	NA	NA	NA	NA	NA
Aniline Compounds									
4-Chloroaniline	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2-Nitroaniline	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
3-Nitroaniline	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
4-Nitroaniline	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA

APPENDIX D-5B
HEXAGON LABORATORIES RI/FFS
IRM UST EXCAVATED SOIL ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	LD1-2-3	FOT#1	FOT#2	#1-2-3	FO1	FO2	SYS1	SYS2	SYS3
Sample Location	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Interval (feet bgs)	0 - 3	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6
Date Sampled	10/8/97	11/14/97	11/14/97	12/5/97	12/22/97	12/22/97	12/22/97	12/22/97	12/22/97
Benzenes/Aromatics									
1,3-Dichlorobenzene	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	730	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Nitrobenzene	5600	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	100 U	3000 U	3000 U	100 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Hexachlorobenzene	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Phthalates									
Dimethylphthalate	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Diethylphthalate	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Di-n-butyl phthalate	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Butylbenzyl phthalate	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	670 U	20000 U	20000 U	1400	NA	NA	NA	NA	NA
Di-n-octyl phthalate	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Other/Miscellaneous SVOCs									
bis(2-choroethyl)Ether	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Hexachloroethane	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Isophorone	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Hexachlorobutadiene	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
bis(2-chloroethoxy)methane	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	1000 U	30000 U	30000 U	1000 U	NA	NA	NA	NA	NA
Dibenzofuran	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
4-Chlorophenyl-phenyl ether	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
N-nitrosodiphenylamine	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
4-Bromophenyl-phenyl ether	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
Benzyl Alcohol	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
bis(2-chloroisopropyl)ether	670 U	20000 U	20000 U	670 U	NA	NA	NA	NA	NA
TOTAL TCL SVOCs	9230	55000	45000	6720					
TOTAL OTHER SVOCs	0	0	0	0					
Total Target SVOCs	9230	55000	45000	6720					

Notes:
1. Analytical data are not validated.
2. U = Not detected; NA = Not analyzed.

APPENDIX D-5C
HEXAGON LABORATORIES RI/FFS
IRM UST EXCAVATED SOIL ANALYTICAL DATA - PESTICIDES/PCBS (ug/kg)

Field sample ID	LD1-2-3	FOT#1	FOT#2	#1-2-3	FO1	FO2	SYS1	SYS2	SYS3
Sample Location	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	SOUTH YARD	SOUTH YARD
Sample Interval (feet bgs)	0 - 3	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6
Date Sampled	10/8/97	11/14/97	11/14/97	12/5/97	12/22/97	12/22/97	12/22/97	12/22/97	12/22/97
Pesticides									
alpha-BHC	5 U	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	5 U	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	5 U	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	5 U	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	5 U	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	5 U	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	5 U	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-Methoxychlor	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	5 U	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	500 U	NA	NA	NA	NA	NA	NA	NA	NA
PCBs									
Aroclor-1016	1000 U	2000 U	2000 U	1000 U	NA	NA	NA	NA	1000 U
Aroclor-1221	1000 U	2000 U	2000 U	1000 U	NA	NA	NA	NA	1000 U
Aroclor-1232	9600	2000 U	2000 U	1000 U	NA	NA	NA	NA	1000 U
Aroclor-1242	1000 U	2000 U	2000 U	1000 U	NA	NA	NA	NA	1000 U
Aroclor-1248	87000	2000 U	2000 U	1000 U	NA	NA	NA	NA	5600
Aroclor-1254	19000	2000 U	2000 U	1000 U	NA	NA	NA	NA	1000 U
Aroclor-1260	1000 U	2000 U	2000 U	1000 U	NA	NA	NA	NA	1000 U

Notes:
1. Analytical data are not validated.
2. U = Not detected; NA = Not analyzed.

APPENDIX D-5D
HEXAGON LABORATORIES RI/FFS
IRM UST EXCAVATED SOIL ANALYTICAL DATA - INORGANICS (mg/kg)

Field sample ID	LD1-2-3	FOT#1	FOT#2	#1-2-3	FO1	FO2	SYS1	SYS2	SYS3
Sample Location	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	NEW PLANT	NEW PLANT	SOUTH YARD	SOUTH YARD	SOUTH YARD
mple Interval (feet bgs)	0 - 3	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6	0 - 6
Date Sampled	10/8/97	11/14/97	11/14/97	12/5/97	12/22/97	12/22/97	12/22/97	12/22/97	12/22/97
Arsenic	6.6 U	6.6 U	6.6 U	6.6 U	NA	NA	NA	NA	NA
Barium	88.8	119	101	109	NA	NA	NA	NA	NA
Cadmium	1.65 U	1.65 U	1.65 U	1.65 U	NA	NA	NA	NA	NA
Chromium	29.4	35.3	44.4	36.8	NA	NA	NA	NA	NA
Copper	144	NA	NA	50.1	NA	NA	NA	NA	NA
Iron	12700	NA	NA	21280	NA	NA	NA	NA	NA
Lead	103	7.3	35.5	54.5	NA	NA	NA	NA	NA
Manganese	127	NA	NA	172	NA	NA	NA	NA	NA
Mercury	0.020 U	0.02 U	0.02 U	0.02 U	NA	NA	NA	NA	NA
Nickel	32.8	NA	NA	51.4	NA	NA	NA	NA	NA
Selenium	1.65 U	1.65 U	1.65 U	3.74	NA	NA	NA	NA	NA
Silver	1.65 U	1.65 U	1.65 U	1.65 U	NA	NA	NA	NA	NA
Zinc	21.9	NA	NA	177	NA	NA	NA	NA	NA

Notes:

1. Analytical data are not validated.

APPENDIX D-6A
HEXAGON LABORATORIES RI/FFS
IRM FLOOR SLAB ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	OP1	OP2	OP3	NP4	NP5	NP6
Sample Location	OLD PLANT	OLD PLANT	OLD PLANT	NEW PLANT	NEW PLANT	NEW PLANT
Sample Interval (inches bgs)	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1
Date Sampled	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97
Aromatics						
Benzene	250 U	50 U	10 U	5 U	5 U	10 U
Toluene	65000	1000	910	130	380	1000
Ethylbenzene	3500	50 U	48	26	12	23
Xylene(total)	15000	150 U	360	140	63	180
Styrene	250 U	50 U	10 U	5 U	5 U	10 U
Halogenated Aliphatics						
Chloromethane	250 U	50 U	10 U	5 U	5 U	10 U
Bromomethane	250 U	50 U	10 U	5 U	5 U	10 U
Vinyl Chloride	250 U	50 U	10 U	5 U	5 U	10 U
Chloroethane	250 U	50 U	10 U	5 U	5 U	10 U
Methylene Chloride	250 U	50 U	10 U	5 U	5 U	10 U
1,1-Dichloroethene	250 U	50 U	10 U	5 U	5 U	10 U
1,1-Dichloroethane	250 U	50 U	10 U	5 U	5 U	10 U
1,2-Dichloroethene (total)	250 U	50 U	10 U	5 U	5 U	10 U
Chloroform	250 U	50 U	10 U	5 U	5 U	10 U
1,2-Dichloroethane	1600	4600	16	5 U	5 U	130
1,1,1-Trichloroethane	250 U	50 U	10 U	5 U	5 U	10 U
Carbon Tetrachloride	250 U	50 U	10 U	5 U	5 U	10 U
Bromodichloromethane	250 U	50 U	10 U	5 U	5 U	10 U
1,2-Dichloropropane	250 U	50 U	10 U	5 U	5 U	10 U
Trichloroethene	250 U	50 U	10 U	5 U	5 U	10 U
Dibromochloromethane	250 U	50 U	10 U	5 U	5 U	10 U
1,1,2-Trichloroethane	250 U	50 U	10 U	5 U	5 U	10 U
Bromoform	250 U	50 U	10 U	5 U	5 U	10 U
Tetrachloroethene	250 U	50 U	10 U	5 U	5 U	10 U
1,1,2,2-Tetrachloroethane	250 U	50 U	10 U	5 U	5 U	10 U
Bromochloromethane	250 U	50 U	10 U	5 U	5 U	10 U
1,2-Dibromo-3-Chloropropane	250 U	50 U	10 U	5 U	5 U	10 U
1,2-Dibromoethane	250 U	50 U	10 U	5 U	5 U	10 U
Dibromomethane	250 U	50 U	10 U	5 U	5 U	10 U
Dichlorodifluoromethane	250 U	50 U	10 U	5 U	5 U	10 U
1,3-Dichloropropane	250 U	50 U	10 U	5 U	5 U	10 U
2,2-Dichloropropane	250 U	50 U	10 U	5 U	5 U	10 U
1,1-Dichloropropene	250 U	50 U	10 U	5 U	5 U	10 U
1,1,1,2-Tetrachloroethane	250 U	50 U	10 U	5 U	5 U	10 U
Trichlorofluoromethane	250 U	50 U	10 U	5 U	5 U	10 U
1,2,3-Trichloropropane	250 U	50 U	10 U	5 U	5 U	10 U

APPENDIX D-6A
HEXAGON LABORATORIES RI/FFS
IRM FLOOR SLAB ANALYTICAL DATA - VOLATILE ORGANICS (ug/kg)

Field sample ID	OP1	OP2	OP3	NP4	NP5	NP6
Sample Location	OLD PLANT	OLD PLANT	OLD PLANT	NEW PLANT	NEW PLANT	NEW PLANT
Sample Interval (inches bgs)	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1
Date Sampled	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97
Ketones						
Acetone	250 U	50 U	10 U	5 U	5 U	10 U
2-Butanone	250 U	50 U	10 U	5 U	5 U	10 U
2-Hexanone	250 U	50 U	10 U	5 U	5 U	10 U
Other/Miscellaneous VOCs						
Carbon disulfide	250 U	50 U	10 U	5 U	5 U	10 U
Chlorobenzene	250 U	50 U	10 U	5 U	5 U	10 U
1,2-Dichlorobenzene	250 U	50 U	10 U	5 U	33	13
1,3-Dichlorobenzene	250 U	50 U	10 U	5 U	5 U	10 U
1,4-Dichlorobenzene	250 U	50 U	10 U	5 U	5 U	10 U
Bromobenzene	250 U	50 U	10 U	5 U	5 U	10 U
n-Butylbenzene	250 U	50 U	10 U	5 U	5 U	10 U
sec-Butylbenzene	250 U	50 U	10 U	5 U	5 U	10 U
tert-Butylbenzene	250 U	50 U	10 U	5 U	5 U	10 U
2-Chlorotoluene	250 U	50 U	10 U	5 U	5 U	10 U
4-Chlorotoluene	250 U	50 U	10 U	5 U	5 U	10 U
Hexachlorobutadiene	250 U	50 U	10 U	5 U	5 U	10 U
Isopropylbenzene	830	50 U	10 U	5 U	5 U	17
p-Isopropyltoluene	250 U	50 U	10 U	5 U	5 U	10 U
Naphthalene	250 U	50 U	10 U	5 U	5 U	10 U
n-Propylbenzene	250 U	50 U	10 U	5 U	5 U	10 U
1,2,3-Trichlorobenzene	250 U	50 U	10 U	5 U	5 U	10 U
1,2,4-Trichlorobenzene	250 U	50 U	10 U	5 U	5 U	10 U
1,3,5-Trimethylbenzene	250 U	50 U	10 U	5 U	5 U	10 U
1,2,4-Trimethylbenzene	330	50 U	10 U	5 U	5 U	10 U
Vinyl Acetate	250 U	50 U	10 U	5 U	5 U	10 U
TOTAL TCL VOCs	85100	5600	1334	296	455	1333
TOTAL OTHER VOCs	1160	0	0	0	33	30
TOTAL TARGET VOCs	86260	5600	1334	296	488	1363

Notes:
1. Analytical data are not validated.
2. U = Not detected.

APPENDIX D-6B
HEXAGON LABORATORIES RI/FFS
IRM FLOOR SLAB ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	OP1	OP2	OP3	NP4	NP5	NP6
Sample Location	OLD PLANT	OLD PLANT	OLD PLANT	NEW PLANT	NEW PLANT	NEW PLANT
Sample Interval (inches bgs)	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1
Date Sampled	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97
Phenols/Acid Extractables						
Phenol	670 U	670 U	670 U	670 U	670 U	670 U
2-Chlorophenol	670 U	670 U	670 U	670 U	670 U	670 U
2-Methylphenol (o-cresol)	670 U	670 U	670 U	670 U	670 U	670 U
4- Methylphenol	670 U	670 U	670 U	700 U	670 U	670 U
2,4-Dimethylphenol	670 U	670 U	670 U	670 U	670 U	670 U
2,4-Dichlorophenol	670 U	670 U	670 U	670 U	670 U	670 U
4-Chloro-3-methylphenol	670 U	670 U	670 U	670 U	670 U	670 U
2,4,6-Trichlorophenol	670 U	670 U	670 U	670 U	670 U	670 U
2,4,5-Trichlorophenol	670 U	670 U	670 U	670 U	670 U	670 U
2,4-Dinitrophenol	1300 U	1300 U	1300 U	1300 U	1300 U	1300 U
2-Nitrophenol	670 U	670 U	670 U	670 U	670 U	670 U
4-Nitrophenol	670 U	670 U	670 U	670 U	670 U	670 U
4,6-Dinitro-2-methylphenol	670 U	850	670 U	670 U	670 U	670 U
Pentachlorophenol	670 U	670 U	670 U	670 U	670 U	670 U
Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	330 U	330 U	330 U	330 U	330 U	330 U
2-Methylnaphthalene	670 U	670 U	670 U	670 U	670 U	670 U
2-Chloronaphthalene	670 U	670 U	670 U	670 U	670 U	670 U
Acenaphthylene	400 U	400 U	400 U	400 U	400 U	400 U
Acenaphthene	330 U	330 U	330 U	330 U	330 U	330 U
Fluorene	330 U	330 U	330 U	330 U	330 U	330 U
Phenanthrene	330 U	330 U	330 U	330 U	330 U	330 U
Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Fluoranthene	330 U	330 U	330 U	330 U	330 U	330 U
Pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(a)anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Chrysene	110	950	140	260	420	110
Benzo(b)fluoranthene	150 U	150 U	150 U	150 U	150 U	150 U
Benzo(k)fluoranthene	100 U	100 U	100 U	100 U	100 U	100 U
Benzo(a)pyrene	40 U	40 U	40 U	40 U	40 U	40 U
Indeno(1,2,3-cd)pyrene	40 U	40 U	40 U	40 U	40 U	40 U
Dibenz(a,h)anthracene	40 U	40 U	40 U	40 U	40 U	40 U
Benzo(g,h,i)perylene	100 U	100 U	100 U	100 U	100 U	100 U
Aniline Compounds						
4-Chloroaniline	670 U	670 U	670 U	670 U	670 U	670 U
2-Nitroaniline	670 U	670 U	670 U	670 U	670 U	670 U
3-Nitroaniline	670 U	670 U	670 U	670 U	670 U	670 U
4-Nitroaniline	670 U	670 U	670 U	670 U	670 U	670 U

APPENDIX D-6B
HEXAGON LABORATORIES RI/FFS
IRM FLOOR SLAB ANALYTICAL DATA - SEMIVOLATILE ORGANICS (ug/kg)

Field sample ID	OP1	OP2	OP3	NP4	NP5	NP6
Sample Location	OLD PLANT	OLD PLANT	OLD PLANT	NEW PLANT	NEW PLANT	NEW PLANT
Sample Interval (inches bgs)	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1	0 - 0.1
Date Sampled	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97	12/11/97
Benzenes/Aromatics						
1,3-Dichlorobenzene	670 U	670 U	670 U	670 U	670 U	670 U
1,4-Dichlorobenzene	670 U	670 U	670 U	670 U	670 U	670 U
1,2-Dichlorobenzene	670 U	670 U	670 U	670 U	670 U	670 U
Nitrobenzene	670 U	4100	670 U	700 U	670 U	670 U
1,2,4-Trichlorobenzene	100 U	100 U	100 U	100 U	100 U	100 U
2,6-Dinitrotoluene	670 U	670 U	670 U	670 U	670 U	670 U
2,4-Dinitrotoluene	670 U	670 U	670 U	670 U	670 U	670 U
Hexachlorobenzene	670 U	670 U	670 U	670 U	670 U	670 U
Phthalates						
Dimethylphthalate	670 U	670 U	670 U	670 U	670 U	670 U
Diethylphthalate	670 U	670 U	670 U	670 U	670 U	670 U
Di-n-butyl phthalate	670 U	670 U	670 U	670 U	670 U	670 U
Butylbenzyl phthalate	670 U	670 U	670 U	670 U	670 U	670 U
bis(2-Ethylhexyl)phthalate	1100	1500	1600	47000	670 U	670 U
Di-n-octyl phthalate	670 U	670 U	670 U	1400	670 U	670 U
Other/Miscellaneous SVOCs						
bis(2-choroethyl)Ether	670 U	670 U	670 U	670 U	670 U	670 U
N-Nitroso-di-n-propylamine	670 U	670 U	670 U	670 U	670 U	670 U
Hexachloroethane	670 U	670 U	670 U	670 U	670 U	670 U
Isophorone	670 U	670 U	670 U	670 U	670 U	670 U
Hexachlorobutadiene	670 U	670 U	670 U	670 U	670 U	670 U
bis(2-chloroethoxy)methane	670 U	670 U	670 U	670 U	670 U	670 U
Hexachlorocyclopentadiene	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U
Dibenzofuran	670 U	670 U	670 U	670 U	670 U	670 U
4-Chlorophenyl-phenyl ether	670 U	670 U	670 U	670 U	670 U	670 U
N-nitrosodiphenylamine	670 U	670 U	670 U	670 U	670 U	670 U
4-Bromophenyl-phenyl ether	670 U	670 U	670 U	670 U	670 U	670 U
3,3'-Dichlorobenzidine	670 U	670 U	670 U	670 U	670 U	670 U
Benzyl Alcohol	2800	670 U	670 U	670 U	670 U	670 U
bis(2-chloroisopropyl)ether	670 U	670 U	670 U	670 U	670 U	670 U
TOTAL TCL SVOCs	1210	7400	1740	48660	420	110
TOTAL OTHER SVOCs	2800	0	0	0	0	0
Total Target SVOCs	4010	7400	1740	48660	420	110

Notes:
1. Analytical data are not validated.
2. U = Not detected.

APPENDIX D-7
HEXAGON LABORATORIES RI/FFS
ANALYTICAL DATA - TCLP (ug/L)

Field sample ID	HX-OM1	HXB1S3	HXB1S7	HXB5S2	HXB10S1	HXB12S2	HXB13S1	SYA
Lab Sample ID	D2085-08	D1911-06	D1911-07	D1875-01	D1860-01	D1860-02	D2003-02	
Sample Location	HTHERM1	MW1	MW1	MW5	NEW PLANT	OLD PLANT	HTHERM1	SOUTH YARD
Sample Description	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	ENV. SAMPLE	0 - 6
Date Sampled	12/18/97	11/19/97	11/19/97	11/14/97	11/12/97	11/12/97	12/9/97	11/17/97
Volatile Organics								
Vinyl Chloride	5 UJ	5 UJ	5 UJ	50 UJ	50 UJ	50 UJ	5 UJ	NA
1,1-Dichloroethene	5 UJ	5 UJ	5 UJ	50 UJ	50 UJ	50 UJ	5 UJ	NA
Chloroform	5 UJ	5 UJ	5 UJ	50 UJ	50 UJ	50 UJ	5 UJ	NA
1,2-Dichloroethane	5 UJ	5 UJ	5 UJ	R	R	R	5 UJ	NA
2-Butanone	5 UJ	5 UJ	5 UJ	50 UJ	50 UJ	50 UJ	5 UJ	NA
Carbon Tetrachloride	5 UJ	5 UJ	5 UJ	50 UJ	50 UJ	50 UJ	5 UJ	NA
Trichloroethene	5 UJ	5 UJ	5 UJ	R	R	R	5 UJ	NA
Benzene	5 UJ	5 UJ	5 UJ	50 UJ	50 UJ	50 UJ	5 UJ	NA
Tetrachloroethene	5 UJ	5 UJ	5 UJ	50 UJ	R	R	5 UJ	NA
Chlorobenzene	5 UJ	5 UJ	5 UJ	50 UJ	1300 U	1300 U	5 UJ	NA
Semivolatile Organics								
Cresol (Total)	33 U	5 J	33 U	370	300	300	33 U	NA
1,4-Dichlorobenzene	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
Hexachloroethane	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
Nitrobenzene	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
Hexachlorobutadiene	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
2,4,6-Trichlorophenol	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
2,4,5-Trichlorophenol	83 U	83 U	83 U	83 U	83 U	83 U	83 U	NA
2,4-Dinitrotoluene	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
Hexachlorobenzene	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
Pentachlorophenol	83 U	83 U	83 U	83 U	83 U	83 U	83 U	NA
Pyridine	33 U	33 U	33 U	33 U	33 U	33 U	33 U	NA
Pesticides & Herbicides								
Chlordane	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U	NA
Endrin	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	NA
Heptachlor	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	NA
Heptachlor Epoxide	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	NA
gamma-BHC (Lindane)	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	NA
Methoxychlor	1.7 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	1.7 U	NA
Toxaphene	17 U	17 U	17 U	17 U	17 U	17 U	17 U	NA
2,4,-D	3.3 UJ	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	NA
2,4,5-TP (Silvex)	0.33 UJ	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	NA
Inorganics								
Arsenic	13.1	13.6	11.6	10.7	10.8	11.2	3.9	24 U
Barium	591 J	1870	861	394	564 J	1170 J	973 J	900
Cadmium	32.2 J	58.8	0.60 U	0.60 U	0.60 U	0.60 U	7.6 J	3.7
Chromium	11.9 J	10.4 J	15.7 J	60.4	63.8 J	113 J	12.4 J	8.1
Lead	5.9	1980 J	36.8 J	26.9	24.1 J	38.2 J	175 J	51
Mercury	28.0	0.28 U	0.28 U	1.1 U	1.1 U	1.1 U	0.28 UJ	0.15
Selenium	5.0 UJ	R	R	R	22.5	16.4	5.0 U	42 U
Silver	2.0 U	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 U	4.3 U

Notes:

1. U = Not detected; J = Estimated value; R = Rejected value; NA = Not analyzed.
2. Analytical data for TCLP sample collected by Trade-Winds during the IRM (SYA) was not validated.

APPENDIX E

RISK QUANTIFICATION CALCULATIONS

TABLE E-1
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
CURRENT AND FUTURE USE SCENARIOS - HIGH END RISKS TO TRESPASSERS

CARCINOGENS - HIGH END SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{mg/kg} \times 100\text{ mg/day} \times 1.00 \times \frac{1}{78.6\text{ kg}} \times \frac{52\text{ days/yr} \times 6\text{ yrs}}{365\text{ days/yr} \times 70\text{ yrs/lifetime}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure (days)	Averaging Time (days/lifetime)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS									
	LEAD	8.87E+02	100	1.00	78.6	3.12E+02	2.56E+04	1.38E-05	(1)	
	SEMIVOLATILE ORGANICS									
	BENZO(A)PYRENE	1.11E+00	100	1.00	78.6	3.12E+02	2.56E+04	1.73E-08	7.30E+00	1.3E-07
									TOTAL RISK	1.3E-07

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-1
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
CURRENT AND FUTURE USE SCENARIOS - HIGH END RISKS TO TRESPASSERS

NONCARCINOGENS - HIGH END SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{mg/kg} \times 100\text{ mg/day} \times 1.00 \times \frac{1}{78.6\text{ kg}} \times \frac{52\text{ days/yr}}{365\text{ days/yr}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure Frequency Averaging Time	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS								
	LEAD	8.87E+02	100	1.00	78.6	1.42E-01	1.61E-04	(1)	
	SEMIVOLATILE ORGANICS								
	BENZO(A)PYRENE	1.11E+00	100	1.00	78.6	1.42E-01	2.02E-07	(2)	
								HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-2
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
CURRENT AND FUTURE USE SCENARIOS - HIGH END RISKS TO TRESPASSERS

CARCINOGENS - HIGH END SURFACE SOIL DERMAL CONTACT EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Absorption Fraction} \times \text{Adherence Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Event Frequency} \times \text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Averaging Time}} \times \text{Surface Area} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times \text{Absorption Fraction} \times 0.03\ \text{mg/cm}^2\text{-event} \times \frac{1}{78.6\text{ kg}} \times \frac{1\ \text{event/day} \times 52\ \text{days/yr} \times 6\ \text{yrs}}{365\ \text{days/yr} \times 70\ \text{years}} \times 4{,}443\ \text{cm2} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/lifetime)	Surface Area (cm^2)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS											
	LEAD	8.87E+02	1.00E-02	0.03	78.6	1	3.12E+02	2.56E+04	4.443E+03	1.84E-07	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	1.11E+00	1.30E-01	0.03	78.6	1	3.12E+02	2.56E+04	4.443E+03	3.00E-09	7.30E+00	2.2E-08
											TOTAL RISK	2.2E-08

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-2
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
CURRENT AND FUTURE USE SCENARIOS - HIGH END RISKS TO TRESPASSERS

NONCARCINOGENS - HIGH END SURFACE SOIL DERMAL CONTACT EXPOSURE

Chronic Daily Intake (mg/kg-day) = Exposure Point Conc. X Absorption Fraction X Adherence Factor X 1 / Body Wt. X Event Frequency X Exposure Frequency / Averaging Time X Surface Area X 1kg / 10^6 mg

Chronic Daily Intake (mg/kg-day) = mg/kg X Absorption Fraction X 0.03 mg/cm^2-event X 1 / 78.6 kg X 1 event/day X 52 days/yr / 365 days/yr X 4,443 cm2 X 1kg / 10^6 mg

Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/year)	Surface Area (cm^2)	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
INORGANICS											
LEAD	8.87E+02	1.00E-02	0.03	78.6	1	5.20E+01	3.65E+02	4.443E+03	2.14E-06	(1)	
SEMIVOLATILE ORGANICS											
BENZO(A)PYRENE	1.11E+00	1.30E-01	0.03	78.6	1	5.20E+01	3.65E+02	4.443E+03	3.50E-08	(2)	
										HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-3
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO SITE WORKERS

CARCINOGENS - HIGH END SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times 50\text{ mg/day} \times 1.00 \times \frac{1}{98.6\text{ kg}} \times \frac{250\text{ days/yr} \times 25\text{ yrs}}{365\text{ days/yr} \times 70\text{ yrs/lifetime}} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure (days)	Averaging Time (days/lifetime)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS									
	LEAD	8.87E+02	50	1.00	98.6	6.25E+03	2.56E+04	1.10E-04	(1)	
	SEMIVOLATILE ORGANICS									
	BENZO(A)PYRENE	1.11E+00	50	1.00	98.6	6.25E+03	2.56E+04	1.38E-07	7.30E+00	1.0E-06
									TOTAL RISK	1.0E-06

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-3
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO SITE WORKERS

NONCARCINOGENS - HIGH END SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times 50\text{ mg/day} \times 1.00 \times \frac{1}{98.6\text{ kg}} \times \frac{250\text{ days/yr}}{365\text{ days/yr}} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure Frequency Averaging Time	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS								
	LEAD	8.87E+02	50	1.00	98.6	6.85E-01	3.08E-04	(1)	
	SEMIVOLATILE ORGANICS								
	BENZO(A)PYRENE	1.11E+00	50	1.00	98.6	6.85E-01	3.87E-07	(2)	
								HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-4
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO SITE WORKERS

CARCINOGENS - HIGH END SURFACE SOIL DERMAL CONTACT EXPOSURE

Chronic Daily Intake (mg/kg-day) = Exposure Point Conc. X Absorption Fraction X Adherence Factor X 1 / Body Wt. X Event Frequency X Exposure Frequency X Exposure Duration / Averaging Time X Surface Area X 1kg / 10^6 mg

Chronic Daily Intake (mg/kg-day) = mg/kg X Absorption Fraction X 0.03 mg/cm^2-event X 1 / 98.6 kg X 1 event/day X 250 days/yr X 25 yrs / 365 days/yr X 70 years X 4,443 cm2 X 1kg / 10^6 mg

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/lifetime)	Surface Area (cm^2)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS											
	LEAD	8.87E+02	1.00E-02	0.03	98.6	1	6.25E+03	2.56E+04	4.443E+03	2.93E-06	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	1.11E+00	1.30E-01	0.03	98.6	1	6.25E+03	2.56E+04	4.443E+03	4.78E-08	7.30E+00	3.5E-07
											TOTAL RISK	3.5E-07

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-4
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO SITE WORKERS

NONCARCINOGENS - HIGH END SURFACE SOIL DERMAL CONTACT EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Absorption Fraction} \times \text{Adherence Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Event Frequency} \times \text{Exposure Frequency}}{\text{Averaging Time}} \times \text{Surface Area} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times \text{Absorption Fraction} \times \frac{0.03\ \text{mg/cm}^2\text{-event}}{} \times \frac{1}{98.6\text{ kg}} \times \frac{1\text{ event/day} \times 250\text{ days/yr}}{365\text{ days/yr}} \times 4{,}443\text{ cm2} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

Group	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/year)	Surface Area (cm^2)	CDI1 (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
Trespassers	**INORGANICS**											
	LEAD	8.87E+02	1.00E-02	0.03	98.6	1	2.50E+02	3.65E+02	4.443E+03	8.21E-06	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	1.11E+00	1.30E-01	0.03	98.6	1	2.50E+02	3.65E+02	4.443E+03	1.34E-07	(2)	
											HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-5
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO CONSTRUCTION WORKERS

CARCINOGENS - HIGH END SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{mg/kg} \times 480\text{ mg/day} \times 1.00 \times \frac{1}{98.6\text{ kg}} \times \frac{250\text{ days/yr} \times 1\text{ yrs}}{365\text{ days/yr} \times 70\text{ yrs/lifetime}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure (days)	Averaging Time (days/lifetime)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS									
	LEAD	8.87E+02	480	1.00	98.6	2.50E+02	2.56E+04	4.23E-05	(1)	
	SEMIVOLATILE ORGANICS									
	BENZO(A)PYRENE	1.11E+00	480	1.00	98.6	2.50E+02	2.56E+04	5.30E-08	7.30E+00	3.9E-07
									TOTAL RISK	3.9E-07

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-5
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO CONSTRUCTION WORKERS

NONCARCINOGENS - HIGH END SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \text{1 Body Wt.} \times \text{Exposure Frequency Averaging Time} \times \text{1kg } 10^6 \text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times 480 \text{ mg/day} \times 1.00 \times \text{1 98.6 kg} \times \text{250 days/yr 365 days/yr} \times \text{1kg } 10^6 \text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure Frequency Averaging Time	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS								
	LEAD	8.87E+02	480	1.00	98.6	6.85E-01	2.96E-03	(1)	
	SEMIVOLATILE ORGANICS								
	BENZO(A)PYRENE	1.11E+00	480	1.00	98.6	6.85E-01	3.71E-06	(2)	
								HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-6
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO CONSTRUCTION WORKERS

CARCINOGENS - HIGH END SURFACE SOIL DERMAL CONTACT EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{Exposure Point Conc.} \times \text{Absorption Fraction} \times \text{Adherence Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Event Frequency} \times \text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Averaging Time}} \times \text{Surface Area} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{mg/kg} \times \text{Absorption Fraction} \times 0.045\ \text{mg/cm}^2\text{-event} \times \frac{1}{98.6\text{ kg}} \times \frac{1\text{ event/day} \times 250\text{ days/yr} \times 1\text{ yrs}}{365\text{ days/yr} \times 70\text{ years}} \times 4{,}443\text{ cm2} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/lifetime)	Surface Area (cm^2)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS											
	LEAD	8.87E+02	1.00E-02	0.045	98.6	1	2.50E+02	2.56E+04	4.443E+03	1.76E-07	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	1.11E+00	1.30E-01	0.045	98.6	1	2.50E+02	2.56E+04	4.443E+03	2.87E-09	7.30E+00	2.1E-08
											TOTAL RISK	2.1E-08

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-6
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - HIGH END RISKS TO CONSTRUCTION WORKERS

NONCARCINOGENS - HIGH END SURFACE SOIL DERMAL CONTACT EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Absorption Fraction} \times \text{Adherence Factor} \times \text{Body Wt.} \times \text{Event Frequency} \times \text{Exposure Frequency} \times \text{Surface Area}}{\text{Averaging Time} \times 10^6 \text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times \text{Absorption Fraction} \times 0.045\ \text{mg/cm}^2\text{-event} \times 1\ \text{98.6 kg} \times 1\ \text{event/day} \times 250\ \text{days/yr} \times 4{,}443\ \text{cm2}}{365\ \text{days/yr} \times 10^6\ \text{mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/year)	Surface Area (cm^2)	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS											
	LEAD	8.87E+02	1.00E-02	0.045	98.6	1	2.50E+02	3.65E+02	4.443E+03	1.23E-05	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	1.11E+00	1.30E-01	0.045	98.6	1	2.50E+02	3.65E+02	4.443E+03	2.01E-07	(2)	
											HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-7
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
CURRENT AND FUTURE USE SCENARIOS - CENTRAL TENDENCY RISKS TO TRESPASSERS

CARCINOGENS - AVERAGE SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{mg/kg} \times 50\text{ mg/day} \times 1.00 \times \frac{1}{55.7\text{ kg}} \times \frac{13\text{ days/yr} \times 2\text{ yrs}}{365\text{ days/yr} \times 70\text{ yrs/lifetime}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure (days)	Averaging Time (days/lifetime)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS									
	LEAD	3.47E+02	50	1.00	55.7	2.60E+01	2.56E+04	3.17E-07	(1)	
	SEMIVOLATILE ORGANICS									
	BENZO(A)PYRENE	5.52E-01	50	1.00	55.7	2.60E+01	2.56E+04	5.04E-10	7.30E+00	3.7E-09
									TOTAL RISK	3.7E-09

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-7
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
CURRENT AND FUTURE USE SCENARIOS - CENTRAL TENDENCY RISKS TO TRESPASSERS

NONCARCINOGENS - AVERAGE SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \text{1 Body Wt.} \times \text{Exposure Frequency Averaging Time} \times \text{1kg}}{10^6 \text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times \text{50 mg/day} \times \text{1.00} \times \text{1 / 55.7 kg} \times \text{13 days/yr / 365 days/yr} \times \text{1kg}}{10^6 \text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure Frequency Averaging Time	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS								
	LEAD	3.47E+02	50	1.00	55.7	3.56E-02	1.11E-05	(1)	
	SEMIVOLATILE ORGANICS								
	BENZO(A)PYRENE	5.52E-01	50	1.00	55.7	3.56E-02	1.76E-08	(2)	
								HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-8
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
CURRENT AND FUTURE USE SCENARIOS - CENTRAL TENDENCY RISKS TO TRESPASSERS

CARCINOGENS - AVERAGE SURFACE SOIL DERMAL CONTACT EXPOSURE

Chronic Daily Intake (mg/kg-day) = Exposure Point Conc. X Absorption Fraction X Adherence Factor X 1 / Body Wt. X Event Frequency X Exposure Frequency / Averaging Time X Exposure Duration X Surface Area X 1kg / 10^6 mg

Chronic Daily Intake (mg/kg-day) = mg/kg X Absorption Fraction X 0.03 mg/cm^2-event X 1 / 55.7 kg X 1 event/day X 26 days/yr / 365 days/yr X 2 yrs / 70 years X 4,443 cm2 X 1kg / 10^6 mg

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/lifetime)	Surface Area (cm^2)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS											
	LEAD	3.47E+02	1.00E-02	0.03	55.7	1	5.20E+01	2.56E+04	4.443E+03	1.69E-08	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	5.52E-01	1.30E-01	0.03	55.7	1	5.20E+01	2.56E+04	4.443E+03	3.49E-10	7.30E+00	2.6E-09
											TOTAL RISK	2.6E-09

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-8
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
CURRENT AND FUTURE USE SCENARIOS - CENTRAL TENDENCY RISKS TO TRESPASSERS

NONCARCINOGENS - AVERAGE SURFACE SOIL DERMAL CONTACT EXPOSURE

Chronic Daily Intake (mg/kg-day) = Exposure Point Conc. X Absorption Fraction X Adherence Factor X 1 / Body Wt. X Event Frequency X Exposure Frequency / Averaging Time X Surface Area X 1kg / 10^6 mg

Chronic Daily Intake (mg/kg-day) = mg/kg X Absorption Fraction X 0.03 mg/cm^2-event X 1 / 55.7 kg X 1 event/day X 26 days/yr / 365 days/yr X 4,443 cm2 X 1kg / 10^6 mg

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/year)	Surface Area (cm^2)	CDII (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS											
	LEAD	3.47E+02	1.00E-02	0.03	55.7	1	2.60E+01	3.65E+02	4.443E+03	5.91E-07	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	5.52E-01	1.30E-01	0.03	55.7	1	2.60E+01	3.65E+02	4.443E+03	1.22E-08	(2)	
											HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI Chronic Daily Intake; RfD Reference Dose.

TABLE E-9
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO SITE WORKERS

CARCINOGENS - AVERAGE SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \text{1 Body Wt.} \times \text{Exposure Frequency} \times \text{Exposure Duration} \times \text{1kg}}{\text{Averaging Time} \quad 10^6 \text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times \text{50 mg/day} \times \text{1.00} \times \text{1 71.8 kg} \times \text{39 days/yr} \times \text{10 yrs} \times \text{1kg}}{\text{365 days/yr} \times \text{70 yrs/lifetime} \quad 10^6 \text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure (days)	Averaging Time (days/lifetime)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS									
	LEAD	3.47E+02	50	1.00	71.8	3.90E+02	2.56E+04	3.69E-06	(1)	
	SEMIVOLATILE ORGANICS									
	BENZO(A)PYRENE	5.52E-01	50	1.00	71.8	3.90E+02	2.56E+04	5.87E-09	7.30E+00	4.3E-08
									TOTAL RISK	4.3E-08

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-9
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO SITE WORKERS

NONCARCINOGENS - AVERAGE SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{mg/kg} \times 50\text{ mg/day} \times 1.00 \times \frac{1}{71.8\text{ kg}} \times \frac{39\text{ days/yr}}{365\text{ days/yr}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure Frequency Averaging Time	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS								
	LEAD	3.47E+02	50	1.00	71.8	1.07E-01	2.58E-05	(1)	
	SEMIVOLATILE ORGANICS								
	BENZO(A)PYRENE	5.52E-01	50	1.00	71.8	1.07E-01	4.11E-08	(2)	
								HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-10
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO SITE WORKERS

CARCINOGENS - AVERAGE SURFACE SOIL DERMAL CONTACT EXPOSURE

Chronic Daily Intake (mg/kg-day) = Exposure Point Conc. X Absorption Fraction X Adherence Factor X 1 / Body Wt. X Event Frequency X Exposure Frequency / Averaging Time X Exposure Duration X Surface Area X 1kg / 10^6 mg

Chronic Daily Intake (mg/kg-day) = mg/kg X Absorption Fraction X 1.0 mg/cm^2-event X 1 / 71.8 kg X 1 event/day X 39 days/yr / 365 days/yr X 10 yrs / 70 years X 4,443 cm2 X 1kg / 10^6 mg

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/lifetime)	Surface Area (cm^2)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS											
	LEAD	3.47E+02	1.00E-02	1.0	71.8	1	3.90E+02	2.56E+04	4.443E+03	3.28E-06	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	5.52E-01	1.30E-01	1.0	71.8	1	3.90E+02	2.56E+04	4.443E+03	6.78E-08	7.30E+00	4.9E-07
											TOTAL RISK	4.9E-07

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-10
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO SITE WORKERS

NONCARCINOGENS - AVERAGE SURFACE SOIL DERMAL CONTACT EXPOSURE

Chronic Daily Intake (mg/kg-day) = Exposure Point Conc. X Absorption Fraction X Adherence Factor X 1 (Body Wt.) X Event Frequency X Exposure Frequency (Averaging Time) X Surface Area X 1kg / 10^6 mg

Chronic Daily Intake (mg/kg-day) = mg/kg X Absorption Fraction X 1.0 mg/cm^2-event X 1 (71.8 kg) X 1 event/day X 39 days/yr (365 days/yr) X 4,443 cm2 X 1kg / 10^6 mg

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/year)	Surface Area (cm^2)	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS											
	LEAD	3.47E+02	1.00E-02	1.0	71.8	1	3.90E+01	3.65E+02	4.443E+03	2.29E-05	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	5.52E-01	1.30E-01	1.0	71.8	1	3.90E+01	3.65E+02	4.443E+03	4.74E-07	(2)	
											HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-11
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO CONSTRUCTION WORKERS

CARCINOGENS - AVERAGE SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times \frac{1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times 480\text{ mg/day} \times 1.00 \times \frac{1}{71.8\text{ kg}} \times \frac{250\text{ days/yr} \times 0.5\text{ yrs}}{365\text{ days/yr} \times 70\text{ yrs/lifetime}} \times \frac{1\text{kg}}{10^6\text{ mg}}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure (days)	Averaging Time (days/lifetime)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS									
	LEAD	3.47E+02	480	1.00	71.8	1.25E+02	2.56E+04	1.13E-05	(1)	
	SEMIVOLATILE ORGANICS									
	BENZO(A)PYRENE	5.52E-01	480	1.00	71.8	1.25E+02	2.56E+04	1.81E-08	7.30E+00	1.3E-07
									TOTAL RISK	1.3E-07

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI - Chronic Daily Intake; SF - Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatitiable due to lack of slope factor data.

TABLE E-11
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL INGESTION PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO CONSTRUCTION WORKERS

NONCARCINOGENS - AVERAGE SURFACE SOIL INGESTION EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Soil Intake} \times \text{Bioavail. Factor} \times 1}{\text{Body Wt.}} \times \frac{\text{Exposure Frequency}}{\text{Averaging Time}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \text{mg/kg} \times 480\text{ mg/day} \times 1.00 \times \frac{1}{71.8\text{ kg}} \times \frac{50\text{ d x 0.5 yr}}{365\text{ days/yr}} \times \frac{1\text{kg}}{10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Intake (mg/day)	Bio-availability Factor	Body Weight (kg)	Exposure Frequency Averaging Time	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS								
	LEAD	3.47E+02	480	1.00	71.8	3.42E-01	7.94E-04	(1)	
	SEMIVOLATILE ORGANICS								
	BENZO(A)PYRENE	5.52E-01	480	1.00	71.8	3.42E-01	1.26E-06	(2)	
								HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

TABLE E-12
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO SITE WORKERS

CARCINOGENS - AVERAGE SURFACE SOIL DERMAL CONTACT EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Absorption Fraction} \times \text{Adherence Factor} \times \text{Body Wt.} \times \text{Event Frequency} \times \text{Exposure Frequency} \times \text{Exposure Duration} \times \text{Surface Area} \times 1\text{kg}}{\text{Averaging Time} \qquad 10^6\text{ mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times \text{Absorption Fraction} \times 0.045\ \text{mg/cm}^2\text{-event} \times 71.8\text{ kg} \times 1\text{ event/day} \times 250\text{ days/yr} \times 0.5\text{ yrs} \times 4{,}443\text{ cm2} \times 1\text{kg}}{365\text{ days/yr} \times 70\text{ years} \qquad 10^6\text{ mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/lifetime)	Surface Area (cm^2)	CDI (mg/kg-day)	SF (kg-day/mg)	RISK SF*CDI
	INORGANICS											
	LEAD	3.47E+02	1.00E-02	0.045	71.8	1	1.25E+02	2.56E+04	4.443E+03	4.73E-08	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	5.52E-01	1.30E-01	0.045	71.8	1	1.25E+02	2.56E+04	4.443E+03	9.78E-10	7.30E+00	7.1E-09
											TOTAL RISK	7.1E-09

Notes:
(1) No Slope Factor is available for this compound.
(2) CDI = Chronic Daily Intake; SF = Slope Factor.
(3) Risk associated with semivolatile organic compound TICs is not quatifiable due to lack of slope factor data.

TABLE E-12
HEXAGON LABORATORIES RI/FFS
SITE SURFACE SOIL DERMAL CONTACT PATHWAY
FUTURE USE SCENARIO - CENTRAL TENDENCY RISKS TO SITE WORKERS

NONCARCINOGENS - AVERAGE SURFACE SOIL DERMAL CONTACT EXPOSURE

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{Exposure Point Conc.} \times \text{Absorption Fraction} \times \text{Adherence Factor} \times \text{Body Wt.} \times \text{Event Frequency} \times \text{Exposure Frequency} \times \text{Exposure Duration} \times \text{Surface Area} \times 1\text{kg}}{\text{Averaging Time} \times 10^6\ \text{mg}}$$

$$\text{Chronic Daily Intake (mg/kg-day)} = \frac{\text{mg/kg} \times \text{Absorption Fraction} \times 0.045\ \text{mg/cm}^2\text{-event} \times 1/71.8\ \text{kg} \times 1\ \text{event/day} \times 250\ \text{days/yr} \times 0.5\ \text{yrs} \times 4{,}443\ \text{cm2} \times 1\text{kg}}{365\ \text{days/yr} \times 10^6\ \text{mg}}$$

	Compound	Exposure Point Conc. (mg/kg)	Absorption Fraction (unitless)	Adherence Factor	Body Weight (kg)	Event Frequency (events/day)	Exposure Frequency (days)	Averaging Time (days/year)	Surface Area (cm^2)	CDI (mg/kg-day)	RfD (mg/kg-day)	CDI/RfD
	INORGANICS											
	LEAD	3.47E+02	1.00E-02	0.045	71.8	1	1.25E+02	3.65E+02	4.443E+03	3.31E-06	(1)	
	SEMIVOLATILE ORGANICS											
	BENZO(A)PYRENE	5.52E-01	1.30E-01	0.045	71.8	1	1.25E+02	3.65E+02	4.443E+03	6.84E-08	(2)	
											HAZARD INDEX	(3)

Notes:
(1) Lead toxicity value is currently not available.
(2) No Reference Dose is available for this contaminant.
(3) Hazard Index is not quatifiable due to lack of numeric reference doses for the contaminants of concern.
Note that semi-volatile TICs were also detected but are not quantifiable due to lack of reference dose data.
(4) CDI = Chronic Daily Intake; RfD = Reference Dose.

APPENDIX F

TOXICOLOGICAL PROFILES

Lead
Benzo(a)pyrene

LEAD

EPA United States Environmental Protection Agency

IRIS Integrated Risk Information System

IRIS Substance File

0277
Lead and compounds (inorganic); CASRN 7439-92-1 (03/01/97)

Health assessment information on a chemical substance is included in IRIS only after a comprehensive review of chronic toxicity data by U.S. EPA health scientists from several Program Offices and the Office of Research and Development. The summaries presented in Sections I and II represent a consensus reached in the review process. Background information and explanations of the methods used to derive the values given in IRIS are provided in the Background Documents.

STATUS OF DATA FOR Lead and compounds (inorganic)

File On-Line 03/01/88

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	message	02/01/91
Inhalation RfC Assessment (I.B.)	no data	
Carcinogenicity Assessment (II.)	on-line	11/01/93

==========

_I. CHRONIC HEALTH HAZARD ASSESSMENTS FOR NONCARCINOGENIC EFFECTS

__I.A. REFERENCE DOSE FOR CHRONIC ORAL EXPOSURE (RfD)

Substance Name -- Lead and compounds (inorganic)
CASRN -- 7439-92-1

A great deal of information on the health effects of lead has been obtained through decades of medical observation and scientific research. This information has been assessed in the development of air and water quality criteria by the Agency's Office of Health and Environmental Assessment (OHEA) in support of regulatory decision-making by the Office of Air Quality Planning and Standards (OAQPS) and by the Office of Drinking Water (ODW). By comparison to most other environmental toxicants, the degree of uncertainty about the health effects of lead is quite low. It appears that some of these effects, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood lead levels so low as to be essentially without a threshold. The Agency's RfD Work Group discussed inorganic lead (and lead compounds) at two meetings (07/08/85

and 07/22/85) and considered it inappropriate to develop an RfD for inorganic lead. For additional information, interested parties are referred to the 1986 Air Quality Criteria for Lead (EPA-600/8-83/028a-dF) and its 1990 Supplement (EPA/600/8-89/049F).

EPA Contacts:

Please contact the Risk Information Hotline for all questions concerning this assessment or IRIS, in general, at (513)569-7254 (phone), (513)569-7159 (FAX) or RIH.IRIS@EPAMAIL.EPA.GOV (internet address).

__I.B. REFERENCE CONCENTRATION FOR CHRONIC INHALATION EXPOSURE (RfC)

Substance Name -- Lead and compounds (inorganic)
CASRN -- 7439-92-1

Not available at this time.

==========

_II. CARCINOGENICITY ASSESSMENT FOR LIFETIME EXPOSURE

Substance Name -- Lead and compounds (inorganic)
CASRN -- 7439-92-1
Last Revised -- 11/01/93

Section II provides information on three aspects of the carcinogenic assessment for the substance in question; the weight-of-evidence judgment of the likelihood that the substance is a human carcinogen, and quantitative estimates of risk from oral exposure and from inhalation exposure. The quantitative risk estimates are presented in three ways. The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day. The unit risk is the quantitative estimate in terms of either risk per ug/L drinking water or risk per ug/cu.m air breathed. The third form in which risk is presented is a drinking water or air concentration providing cancer risks of 1 in 10,000, 1 in 100,000 or 1 in 1,000,000. The rationale and methods used to develop the carcinogenicity information in IRIS are described in The Risk Assessment Guidelines of 1986 (EPA/600/8-87/045) and in the IRIS Background Document. IRIS summaries developed since the publication of EPA's more recent Proposed Guidelines for Carcinogen Risk Assessment also utilize those Guidelines where indicated (Federal Register 61(79):17960-18011, April 23, 1996). Users are referred to Section I of this IRIS file for information on long-term toxic effects other than carcinogenicity.

__II.A. EVIDENCE FOR CLASSIFICATION AS TO HUMAN CARCINOGENICITY

___II.A.1. WEIGHT-OF-EVIDENCE CLASSIFICATION

Classification -- B2; probable human carcinogen

Basis -- Sufficient animal evidence. Ten rat bioassays and one mouse assay have shown statistically significant increases in renal tumors with dietary and subcutaneous exposure to several soluble lead salts. Animal assays

provide reproducible results in several laboratories, in multiple rat strains with some evidence of multiple tumor sites. Short term studies show that lead affects gene expression. Human evidence is inadequate.

II.A.2. HUMAN CARCINOGENICITY DATA

Inadequate. There are four epidemiologic studies of occupational cohorts exposed to lead and lead compounds. Two studies (Dingwall-Fordyce and Lane, 1963; Nelson et al., 1982) did not find any association between exposure and cancer mortality. Selevan et al. (1985), in their retrospective cohort mortality study of primary lead smelter workers, found a slight decrease in the total cancer mortality (SMR=95). Apparent excesses were observed for respiratory cancer (SMR=111, obs=41, $p > 0.05$) and kidney cancer (SMR=204, obs=6, $p > 0.05$). Cooper and Gaffey (1975) and Cooper (1985 update) performed a cohort mortality study of battery plant workers and lead smelter workers. They found statistically significant excesses for total cancer mortality (SMR=113, obs=344), stomach cancer (SMR=168, obs=34), and lung cancer (SMR=124, obs=109) in the battery plant workers. Although similar excesses were observed in the smelter workers, they were not statistically significant. Cooper and Gaffey (1975) felt it was possible that individual subjects were monitored primarily on the basis of obvious signs of lead exposure, while others who showed no symptoms of lead poisoning were not monitored.

All of the available studies lacked quantitative exposure information, as well as information on the possible contribution from smoking. All studies also included exposures to other metals such as arsenic, cadmium, and zinc for which no adjustment was done. The cancer excesses observed in the lung and stomach were relatively small (<200). There was no consistency of site among the various studies, and no study showed any dose-response relationship. Thus, the available human evidence is considered to be inadequate to refute or demonstrate any potential carcinogenicity for humans from lead exposure.

II.A.3. ANIMAL CARCINOGENICITY DATA

Sufficient. The carcinogenic potential of lead salts (primarily phosphates and acetates) administered via the oral route or by injection has been demonstrated in rats and mice by more than 10 investigators. The most characteristic cancer response is bilateral renal carcinoma. Rats given lead acetate or subacetate orally have developed gliomas, and lead subacetate also produced lung adenomas in mice after i.p. adminstration. Most of these investigations found a carcinogenic response only at the highest dose. The lead compounds tested in animals are almost all soluble salts. Metallic lead, lead oxide and lead tetralkyls have not been tested adequately. Studies of inhalation exposure have not been located in the literature.

Azar et al. (1973) administerd 10, 50, 100, and 500 ppm lead as lead acetate in dietary concentrations to 50 rats/sex/group for 2 years. Control rats (100/sex) received the basal laboratory diet. In a second 2-year feeding study, 20 rats/group were given diets containing 0, 1000, and 2000 ppm lead as lead acetate. No renal tumors were reported in the control groups or in treated animals of either sex receiving 10 to 100 ppm. Male rats fed 500, 1000, and 2000 ppm lead acetate had an increased renal tumor incidence of 5/50, 10/20, and 16/20, while 7/20 females in the 2000-ppm group developed renal tumors.

The Azar et al. (1973) study is limited by the lack of experimental detail. The possibility of environmental contamination from lead in the air or drinking water was not mentioned. The strains of rats used were not specified in the study, but the Health Effects Assessment for Lead (U.S. EPA, 1984) indicates the rats were Wistar strain. The weight gain at 1000 and 2000 ppm was reported to be depressed, but details were not given.

Kasprzak et al. (1985), in investigating the interaction of dietary calcium on lead carcinogenicity, fed 1% lead subacetate (8500 ppm Pb) to male Sprague-Dawley rats in the diet for 79 weeks. Of the rats surviving (29/30) in this treatment group beyond 58 weeks, 44.8% had renal tumors. Four rats had adenocarcinomas; the remainaing nine had adenomas. Bilateral tumors were noted. No renal tumors were noted among the controls.

As part of a study to determine interactions between sodium nitrite, ethyl urea and lead, male Sprague-Dawley rats were given lead acetate in their drinking water for 76 weeks (Koller et al., 1986). The concentration of lead was 2600 ppm. No kidney tumors were detected among the 10 control rats. Thirteen of 16 (81%) lead-treated rats had renal tubular carcinoma; three tumors were detected at 72 weeks and the remainder detected at the termination of the study.

Van Esch and Kroes (1969) fed basic lead acetate at 0, 0.1%, and 1.0% in the diet to 25 Swiss mice/sex/group for 2 years. No renal tumors developed in the control group, but 6/25 male mice of 0.1% basic lead acetate group had renal tumors (adenomas and carcinomas combined). In the 1.0% group, one female had a renal tumor. The authors thought that the low incidence in the 1.0% group was due to early mortality.

Hamsters given lead subacetate at 0.5% and 1% in the diet had no significant renal tumor response (Van Esch and Kroes, 1969).

___II.A.4. SUPPORTING DATA FOR CARCINOGENICITY

Lead acetate induces cell transformation in Syrian hamster embryo cells (DiPaolo et al., 1978) and also enhances the incidence of simian adenovirus induction. Lead oxide showed similar enhanced adenovirus induction (Casto et al., 1979).

Under certain conditions lead compounds are capable of inducing chromosomal aberrations in vivo and in tissue cultures. Grandjean et al. (1983) showed a relationship between SCE and lead exposure in exposed workers. Lead has been shown, in a number of DNA structure and function assays, to affect the molecular processes associated with the regulation of gene expression (U.S. EPA, 1986).

__II.B. QUANTITATIVE ESTIMATE OF CARCINOGENIC RISK FROM ORAL EXPOSURE

Not available.

Quantifying lead's cancer risk involves many uncertainties, some of which may be unique to lead. Age, health, nutritional state, body burden, and exposure duration influence the absorption, release, and excretion of lead. In addition, current knowledge of lead pharmacokinetics indicates that an estimate derived by standard procedures would not truly describe the potential risk. Thus, the Carcinogen Assessment Group recommends that a numerical estimate not be used.

__II.C. QUANTITATIVE ESTIMATE OF CARCINOGENIC RISK FROM INHALATION EXPOSURE

Not available.

__II.D. EPA DOCUMENTATION, REVIEW, AND CONTACTS (CARCINOGENICITY ASSESSMENT)

___II.D.1. EPA DOCUMENTATION

Source Document -- U.S. EPA, 1984, 1986, 1989

U.S. EPA, 1989 has received OHEA and SAB review.

The 1986 Air Quality Criteria Document for Lead has received Agency and External Review.

___II.D.2. REVIEW (CARCINOGENICITY ASSESSMENT)

Agency Work Group Review -- 05/04/88

Verification Date -- 05/04/88

___II.D.3. U.S. EPA CONTACTS (CARCINOGENICITY ASSESSMENT)

Please contact the Risk Information Hotline for all questions concerning this assessment or IRIS, in general, at (513)569-7254 (phone), (513)569-7159 (FAX) or RIH.IRIS@EPAMAIL.EPA.GOV (internet address).

==========

_VI. BIBLIOGRAPHY

Substance Name -- Lead and compounds (inorganic)
CASRN -- 7439-92-1
Last Revised -- 11/01/93

__VI.A. ORAL RfD REFERENCES

None

__VI.B. INHALATION RfD REFERENCES

None

__VI.C. CARCINOGENICITY ASSESSMENT REFERENCES

Anderson, E.L., and CAG (Carcinogenic Assessment Group). 1983. Quantitative approaches in use to assess cancer risk. Risk Analysis. 3: 277-295.

Azar, A., H.J. Trochimowicz and M.E. Maxfield. 1973. Review of lead studies in animals carried out at Haskell Laboratory - Two year feeding study and response to hemorrhage study. In: Barth D., A. Berlin, R. Engel, P. Recht and J. Smeets, Ed. Environmental health aspects of lead: Proceedings International Symposium; October 1972; Amsterdam, The Netherlands. Commission of the European Communities, Luxemberg. p. 199-208.

Casto, B.C., J. Meyers and J.A. DiPaolo. 1979. Enhancement of viral transformation for evaluation of the carcinogenic or mutagenic potential of inorganic metal salts. Cancer Res. 39: 193-198.

Cooper, W.C. 1985. Mortality among employees of lead battery plants and lead producing plants, 1947-1980. Scand. J. Work Environ. Health. 11: 331-345.

Cooper, W.C. and W.R. Gaffey. 1975. Mortality of lead workers. In: Proceedings of the 1974 Conference on Standards of Occupational Lead Exposure, J.F. Cole, Ed., February, 1974. Washington, DC. J. Occup. Med. 17: 100-107.

Dingwall-Fordyce, I. and R.E. Lane. 1963. A follow-up study of lead workers. Br. J. Ind. Med. 20: 313-315.

DiPaolo, J.A., R.L. Nelson and B.C. Casto. 1978. In vitro neoplastic transformation of Syrian hamster cells by lead acetate and its relevance to environmental carcinogenesis. Br. J. Cancer. 38: 452-455.

Grandjean, P., H.C. Wulf and E. Niebuhr. 1983. Sister chromatid exchange in response to variations in occupational lead exposure. Environ. Res. 32: 199-204.

Kasprzak, K.S., K.L. Hoover and L.A. Poirier. 1985. Effects of dietary calcium acetate on lead subacetate carcinogenicity in kidneys of male Sprague-Dawley rats. Carcinogenesis. 6(2): 279-282.

Koller, L.D., N.I. Kerkvliet and J.H. Exon. 1986. Neoplasia induced in male rats fed lead acetate, ethyl urea and sodium nitrate. Toxicol. Pathol. 13: 50-57.

Nelson, D.J., L. Kiremidjian-Schumacher and G. Stotzky. 1982. Effects of cadmium, lead, and zinc on macrophage-mediated cytotoxicity toward tumor cells. Environ. Res. 28: 154-163.

Selevan, S.G., P.J. Landrigan, F.B. Stern and J.H. Jones. 1985. Mortality of lead smelter workers. Am. J. Epidemiol. 122: 673-683.

U.S. EPA. 1984. Health Effects Assessment for Lead. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH, for the Office of Emergency and Remedial Response, Washington, DC. EPA/540/1-86/055. NTIS PB85-163996/AS.

U.S. EPA. 1986. Air Quality Criteria Document for Lead. Volumes III, IV. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Research Triangle Park, NC, for the Office of Air Quality Planning and Standards. EPA-600/8-83/028dF.

U.S. EPA. 1989. Evaluation of the potential carcinogenicity of lead and lead compounds: In support of reportable quantity adjustments pursuant to CERCLA Section 102. Prepared by the Office of Health and Environmental Assessment, Washington, DC. EPA/600/8-89/045A. (External Review Draft).

Van Esch, G.J. and R. Kroes. 1969. The induction of renal tumors by feeding of basic lead acetate to mice and hamsters. Br. J. Cancer. 23: 265-271.

==========

_VII. REVISION HISTORY

Substance Name -- Lead and compounds (inorganic)
CASRN -- 7439-92-1

Date	Section	Description
09/26/88	II.	Carcinogen summary on-line
02/01/89	IV.B.1.	Effect level corrected in discussion
06/01/89	II.D.3.	Primary contact changed
06/01/89	IV.A.1.	Reference corrected - changed number for part in CFR
12/01/89	II.A.3.	Last paragraph - Correct Van Esch 1969 citation
12/01/89	VI.	Bibliography on-line
07/01/90	I.A.	Changed contact J. Cohen's office and telephone number
07/01/90	IV.F.1.	EPA contact changed
02/01/91	I.A.	Message revised to include new EPA document
02/01/91	I.A.	EPA contacts changed
05/01/91	II.A.	Text edited
01/01/92	IV.	Regulatory actions updated
06/01/92	IV.B.2.	MCL monitoring reqs. and BAT corrected
07/01/93	II.D.3.	Secondary contact's phone number changed
07/01/93	VI.C.	References alphabetized correctly
11/01/93	II.D.1.	U.S. EPA 1987 replaced with 1989; rev. state. revised
11/01/93	VI.C.	U.S. EPA 1987 deleted; U.S. EPA 1989 added

==========

SYNONYMS

Substance Name -- Lead and compounds (inorganic)
CASRN -- 7439-92-1
Last Revised -- 03/01/88

7439-92-1
Lead
Lead and compounds
plumbum

End of IRIS Substance File

IRIS Home Page | Substance File List

Send Comments | Search | NCEA Home Page | ORD Home Page | EPA Home Page

Last updated: **February 6, 1998**

BENZO(A)PYRENE

EPA United States Environmental Protection Agency

IRIS Integrated Risk Information System

IRIS Substance File

0136
Benzo[a]pyrene (BaP); CASRN 50-32-8 (03/01/97)

Health assessment information on a chemical substance is included in IRIS only after a comprehensive review of chronic toxicity data by U.S. EPA health scientists from several Program Offices and the Office of Research and Development. The summaries presented in Sections I and II represent a consensus reached in the review process. Background information and explanations of the methods used to derive the values given in IRIS are provided in the Background Documents.

STATUS OF DATA FOR BaP

File On-Line 03/31/87

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	no data	
Inhalation RfC Assessment (I.B.)	no data	
Carcinogenicity Assessment (II.)	on-line	11/01/94

==========

_I. CHRONIC HEALTH HAZARD ASSESSMENTS FOR NONCARCINOGENIC EFFECTS

__I.A. REFERENCE DOSE FOR CHRONIC ORAL EXPOSURE (RfD)

Substance Name -- Benzo[a]pyrene (BaP)
CASRN -- 50-32-8

Not available at this time.

__I.B. REFERENCE CONCENTRATION FOR CHRONIC INHALATION EXPOSURE (RfC)

Substance Name -- Benzo[a]pyrene (BaP)
CASRN -- 50-32-8

Not available at this time.

==========

_II. CARCINOGENICITY ASSESSMENT FOR LIFETIME EXPOSURE

Substance Name -- Benzo[a]pyrene (BaP)
CASRN -- 50-32-8
Last Revised -- 11/01/94

Section II provides information on three aspects of the carcinogenic assessment for the substance in question; the weight-of-evidence judgment of the likelihood that the substance is a human carcinogen, and quantitative estimates of risk from oral exposure and from inhalation exposure. The quantitative risk estimates are presented in three ways. The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day. The unit risk is the quantitative estimate in terms of either risk per ug/L drinking water or risk per ug/cu.m air breathed. The third form in which risk is presented is a drinking water or air concentration providing cancer risks of 1 in 10,000, 1 in 100,000 or 1 in 1,000,000. The rationale and methods used to develop the carcinogenicity information in IRIS are described in The Risk Assessment Guidelines of 1986 (EPA/600/8-87/045) and in the IRIS Background Document. IRIS summaries developed since the publication of EPA's more recent Proposed Guidelines for Carcinogen Risk Assessment also utilize those Guidelines where indicated (Federal Register 61(79):17960-18011, April 23, 1996). Users are referred to Section I of this IRIS file for information on long-term toxic effects other than carcinogenicity.

NOTE: At the June 1992 CRAVE Work Group meeting, a revised risk estimate for benzo[a]pyrene was verified (see Additional Comments for Oral Exposure). This section provides information on three aspects of the carcinogenic risk assessment for the agent in question; the U.S. EPA classification, and quantitative estimates of risk from oral exposure and from inhalation exposure. The classification reflects a weight-of-evidence judgment of the likelihood that the agent is a human carcinogen. The quantitative risk estimates are presented in three ways. The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day. The unit risk is the quantitative estimate in terms of either risk per ug/L drinking water or risk per ug/cu.m air breathed. The third form in which risk is presented is a drinking water or air concentration providing cancer risks of 1 in 10,000 or 1 in 1,000,000. The Carcinogenicity Background Document provides details on the rationale and methods used to derive the carcinogenicity values found in IRIS. Users are referred to the Oral Reference Dose (RfD) and Reference Concentration (RfC) sections for information on long-term toxic effects other than carcinogenicity.

__II.A. EVIDENCE FOR CLASSIFICATION AS TO HUMAN CARCINOGENICITY

___II.A.1. WEIGHT-OF-EVIDENCE CLASSIFICATION

Classification -- B2; probable human carcinogen

Basis -- Human data specifically linking benzo[a]pyrene (BAP) to a carcinogenic effect are lacking. There are, however, multiple animal studies in many species demonstrating BAP to be carcinogenic following administration by numerous routes. BAP has produced positive results in numerous genotoxicity assays.

___II.A.2. HUMAN CARCINOGENICITY DATA

Inadequate. Lung cancer has been shown to be induced in humans by various mixtures of polycyclic aromatic hydrocarbons known to contain BAP including cigarette smoke, roofing tar and coke oven emissions. It is not possible, however, to conclude from this information that BAP is the responsible agent.

___II.A.3. ANIMAL CARCINOGENICITY DATA

Sufficient. The animal data consist of dietary, gavage, inhalation, intratracheal instillation, dermal and subcutaneous studies in numerous strains of at least four species of rodents and several primates. Repeated BAP administration has been associated with increased incidences of total tumors and of tumors at the site of exposure. Distant site tumors have also been observed after BAP administration by various routes. BAP is frequently used as a positive control in carcinogenicity bioassays.

BAP administered in the diet or by gavage to mice, rats and hamsters has produced increased incidences of stomach tumors. Neal and Rigdon (1967) fed BAP (purity not reported) at concentrations of 0, 1, 10, 20, 30, 40, 45, 50, 100 and 250 ppm in the diets of male and female CFW-Swiss mice. The age of the mice ranged from 17-180 days old and the treatment time from 1-197 days; the size of the treated groups ranged from 9 to 73. There were 289 mice (number of mice/sex not stated) in the control group. No forestomach tumors were reported in the 0-, 1- and 10-ppm dose groups. The incidence of forestomach tumors in the 20-, 30-, 40-, 45-, 50-, 100- and 250-ppm dose groups were 1/23, 0/37, 1/40, 4/40, 23/34, 19/23 and 66/73, respectively. The authors felt that the increasing tumor incidences were related to both the concentration and the number of doses administered. Historical control forestomach tumor data are not available for CFW-Swiss strain mice. In historical control data from a related mouse strain, SWR/J Swill, the forestomach tumor incidence rate was 2/268 and 1/402 for males and females, respectively (Rabstein et al., 1973).

Brune et al., (1981) fed 0.15 mg/kg BAP (reported to be "highly pure") in the diet of 32 Sprague-Dawley rats/sex/group either every 9th day or 5 times/week. These treatments resulted in annual average doses of 6 or 39 mg/kg, respectively. An untreated group of 32 rats/sex served as the control. Rats were treated until moribund or dead; survival was similar in all groups. Histologic examinations were performed on each rat. The combined incidence of tumors of the forestomach, esophagus and larynx was 3/64, 3/64 and 10/64 in the control group, the group fed BAP every 9th day and the group fed BAP 5 times/week, respectively. A trend analysis showed a statistically significant tendancy for the proportion of animals with tumors of the forestomach, esophagus or larynx to increase steadily with dose (Knauf and Rice, 1992).

As part of the same study, Brune et al. (1981) administered BAP ("highly pure") orally to Sprague-Dawley rats by caffeine gavage. The rats were treated until moribund or dead; all rats were subjected to terminal histopathologic examination. Gavaged rats were divided into 3 dose groups of 32 rats/sex/group; the groups received 0.15 mg/kg per gavage either every 9th day (Group A), every 3rd day (Group B) or 5 times per week (Group C); these treatments resulted in annual average doses of 6, 18 or 39 mg/kg, respectively. Untreated and gavage (5 times/week) controls (32 rats/sex/group) were included. The median survival times for the untreated control group; the gavage control group; and groups A, B and C were 129, 102, 112, 113 and 87 weeks, respectively. The survival time of Group C was short compared with controls and may have precluded tumor formation (Knauf and Rice, 1992). The combined tumor incidence in the forestomach, esophagus and larynx was 3/64, 6/64, 13/64, 26/64 and 14/64 for the untreated control group, gavage control group, group A, group B and group C, respectively. There was a statistically significant association between the dose and the proportions of rats with tumors of the forestomach, esophagus or larynx. This association is not characterized by a linear trend. The linearity was affected by the apparently reduced tumor incidence that is seen in the high-dose group (Knauf and Rice, 1992).

Intratracheal instillation and inhalation studies in guinea pigs, hamsters and rats have resulted in elevated incidences of respiratory tract and upper digestive tract tumors (U.S. EPA, 1991a). Male Syrian golden hamsters (24/group) were exposed by inhalation to 0, 2.2, 9.5 or 46.5 mg BAP/cu.m in a sodium chloride aerosol (Thyssen et al., 1981). (Greater than 99% of the particles had diameters between 0.2 and 0.5 um.) For the first 10 weeks of the study, the hamsters were exposed to BAP daily for 4.5 hours/day; thereafter, daily for 3 hours/day. Animals dying within the first year of the study were replaced; the effective number of hamsters in the control, low-, mid- and high-dose groups was 27, 27, 26 and 25, respectively. (The total time of treatment, although over 60 weeks, was not stated.) During the first 10 weeks, animals in the 3 dose groups reportedly lost weight. After week 10, however, the body weights in all groups were similar until week 60 when the body weights of hamsters in the high-dose group decreased and the mortality increased significantly. The incidence of respiratory tract tumors (including tumors of the nasal cavity, larynx and trachea) in the control, low-, mid- and high-dose groups was 0/27, 0/27, 9/26 and 13/25, respectively; the incidences of upper digestive tract tumors (including tumors of the pharynx, esophagus and forestomach) were 0/27, 0/27, 7/26 and 14/25, respectively. Trend analysis for incidences of both respiratory tract tumors and upper gastrointestinal tract tumors showed a statistically significant tendancy for the proportion of animals with either tumor type to increase steadily with increased dose (Knauf and Rice, 1992).

Intraperitoneal BAP injections have caused increases in the number of injection site tumors in mice and rats (reviewed in U.S. EPA, 1991a). Subcutaneous BAP injections have caused increases in the number of injection site tumors in mice, rats, guinea pigs, hamsters and some primates (IARC, 1983; U.S. EPA, 1991a). BAP is commonly used as a positive control in many dermal application bioassays and has been shown to cause skin tumors in mice, rats, rabbits and guinea pigs. BAP is both an initiator and a complete carcinogen in mouse skin (IARC, 1983). Increased incidences of distant site tumors have also been reported in animals as a consequence of dermal BAP exposure (reviewed in U.S. EPA, 1991a).

BAP has also been reported to be carcinogenic in animals when administered by the following routes: i.v.; transplacentally; implantation in the stomach wall, lung, renal parenchyma and brain; injection into the renal pelvis; and vaginal painting (U.S. EPA, 1991a).

___II.A.4. SUPPORTING DATA FOR CARCINOGENICITY

Benzo[a]pyrene has been shown to cause genotoxic effects in a broad range of prokaryotic and mammalian cell assay systems (U.S. EPA, 1991a). In prokaryotes, BAP tested positive in DNA damage assays and in both reverse and forward mutation assays. In mammalian cell culture assays, BAP tested positive in DNA damage assays, forward mutation assays, chromosomal effects assays and cell transformation assays.

__II.B. QUANTITATIVE ESTIMATE OF CARCINOGENIC RISK FROM ORAL EXPOSURE

NOTE: The range of oral slope factors calculated was: 4.5E+0 to 11.7E+0 per (mg/kg)/day.

___II.B.1. SUMMARY OF RISK ESTIMATES

Oral Slope Factor -- 7.3E+0 per (mg/kg)/day

Drinking Water Unit Risk -- 2.1E-4 per (ug/L)

Extrapolation Method -- Risk estimate based on a geometric mean of four slope

factors obtained by differing modeling procedures. Derived from the combination of multiple data sets from two different reports using more than one sex and species.

Drinking Water Concentrations at Specified Risk Levels:

Risk Level	Concentration
E-4 (1 in 10,000)	5E-1 ug/L
E-5 (1 in 100,000)	5E-2 ug/L
E-6 (1 in 1,000,000)	5E-3 ug/L

___II.B.2. DOSE-RESPONSE DATA (CARCINOGENICITY, ORAL EXPOSURE)

Tumor Type -- forestomach, squamous cell papillomas and carcinomas
Test Animals -- CFW mice, sex unknown
Route -- oral, diet
Reference -- Neal and Rigdon, 1967

a) Conditional upper bound two-stage model with terms for promotion (modification of Moolgavkar-Venson-Knudson, generalized forms of two-stage model)

Administered Dose (ppm)	Tumor Incidence
0	0/289
1	0/25
10	0/24
20	1/23
30	0/37
40	1/40
45	4/40
50	24/34
100	19/23
250	66/73

Tumor Type -- squamous cell carcinoma of the forestomach
Test Animals -- SWR/J Swill mice
Route -- oral, diet
Reference -- Rabstein et al., 1973

Administered Dose (ppm)	Tumor Incidence
0	2/268* male
0	1/402* female

*See additional comments concerning the use of control data from other studies that utilized similar mouse strains.

b) Same data as above. Upper bound estimate by extrapolation from 10% response point to background of empirically fitted dose-response curve. (Procedure using two-stage model described in (a)).

c) Same data as above except the additional 2 control groups (Rabstein et al., 1973) were excluded. Generalized Weibull-type dose-response model.

d) Tumor Type -- forestomach, larynx and esophagus, papillomas and carcinomas (combined). Linearized Multistage Model, Extra Risk.

Test Animals -- Sprague-Dawley rats, males and females
Route -- oral, diet
Reference -- Brune et al., 1981

Dose (mg/kg diet/year)	Tumor Incidence

0	3/64
6	3/64
39	10/64

___II.B.3. ADDITIONAL COMMENTS (CARCINOGENICITY, ORAL EXPOSURE)

At the June 1992 CRAVE Work Group meeting, it was noted that an error had been made in the 1991 document "Dose-Response Analysis of Ingested Benzo[a]pyrene" which is quoted in the Drinking Water Criteria Document for PAH. In the calculation of the doses in the Brune et al. (1981) study it was erroneously concluded that doses were given in units of mg/year, whereas it was in fact mg/kg/year. When the doses are corrected the slope factor is correctly calculated as 11.7 per (mg/kg)/day, as opposed to 4.7 per (mg/kg)/day as reported in the Drinking Water Criteria Document. The correct range of slope factors is 4.5 to 11.7 per (mg/kg)/day, with a geometric mean of 7.3 per (mg/kg)/day. A drinking water unit risk based on the revised slope factor is 2.1E-4 per (ug/L). Therefore, these values have been changed on IRIS and an Erratum to the Drinking Water Criteria Document is being prepared.

Risk estimates were calculated from two different studies in two species of outbred rodents (Neal and Rigdon, 1967; Brune et al., 1981). These studies have several commonalities including mode of administration, tumor sites, tumor types and the presumed mechanisms of action. The data sets were not combined prior to modeling (the preferred approach) because they employed significantly dissimilar protocols.

The geometric mean from several slope factors, each considered to be of equal merit, was used to calculate a single unit risk. These four slope factor estimates span less than a factor of three and each is based on an acceptable, but less-than-optimal, data set. Each estimate is based on a low-dose extrapolation procedure which entails the use of multiple assumptions and default procedures.

Clement Associates (1990) fit the Neal and Rigdon (1967) data to a two-stage dose response model. In this model the transition rates and the growth rate of preneoplastic cells were both considered to be exposure-dependent. (The functional form for the dose-dependence of preneoplastic cell growth rate was simple saturation.) A term to permit the modeling of BAP as its own promoter was also included. Historical control stomach tumor data from a related, but not identical, mouse strain, SWR/J Swill (Rabstein et al., 1973) and the CFW Texas colony (Neal and Rigdon, 1967) were used in the modeling. In calculating the lifetime unit risk for humans several standard assumptions were made: mouse food consumption was 13% of its body weight/day; human body weight was assumed to be 70 kg and the assumed body weight of the mouse 0.034 kg. The standard assumption of surface area equivalence between mice and humans was the cube root of 70/0.034. A conditional upper bound estimate was calculated to be 5.9 per (mg/kg)/day (U.S. EPA, 1991a).

A U.S. EPA report (1991b) argued that the upper-bound estimate calculated in Clement Associates (1990) involved the use of unrealistic conditions placed on certain parameters of the equation. Other objections to this slope factor were also raised. The authors of this report used the Neal and Rigdon (1967) data to generate an upper-bound estimate extrapolated linearly from the 10% response point to the background of an empirically fitted dose-response curve (Clement Associates, 1990). Other results, from similar concepts and approaches used for other compounds, suggest that the potency slopes calculated in this manner are comparable to those obtained from a linearized multistage procedure for the majority of the other compounds. The upper bound estimate calculated in U.S. EPA (1991b) is 9.0 per (mg/kg)/day.

The authors of U.S. EPA (1991b) selected a model to reflect the partial lifetime exposure pattern over different parts of the animals' lifetimes. The authors thought that this approach more closely reflected the Neal and Rigdon (1967) regimen. A Weibull-type dose-response model was selected to accommodate the partial lifetime exposure; the upper-bound slope factor calculated from this method was 4.5 per (mg/kg)/day.

Using the dietary portion of the Brune et al. (1981) rat data, a linearized multistage procedure was used to calculate an upper bound slope factor for humans. In the interspecies conversion the assumed human body weight was 70 kg and the rat 0.4 kg. The slope factor calculated by this method was 11.7 per (mg/kg)/day.

___II.B.4. DISCUSSION OF CONFIDENCE (CARCINOGENICITY, ORAL EXPOSURE)

The data are considered to be less than optimal, but acceptable. There are precedents for using multiple data sets from different studies using more than one sex, strain and species; the use of the geometric mean of four slope factors is preferred because it makes use of more of the available data. The use of the geometric means was based on arguments presented in a personal communication (Stiteler, 1991).

__II.C. QUANTITATIVE ESTIMATE OF CARCINOGENIC RISK FROM INHALATION EXPOSURE

Not available.

__II.D. EPA DOCUMENTATION, REVIEW, AND CONTACTS (CARCINOGENICITY ASSESSMENT)

___II.D.1. EPA DOCUMENTATION

Source Document -- U.S. EPA, 1991a,b

The 1991 Drinking Water Criteria Document for the polycyclic aromatic hydrocarbons has received agency review.

___II.D.2. REVIEW (CARCINOGENICITY ASSESSMENT)

Agency Work Group Review -- 01/07/87, 12/04/91, 06/03/92, 08/05/93, 02/02/94, 06/09/94

Verification Date -- 12/04/91

___II.D.3. U.S. EPA CONTACTS (CARCINOGENICITY ASSESSMENT)

Please contact the Risk Information Hotline for all questions concerning this assessment or IRIS, in general, at (513)569-7254 (phone), (513)569-7159 (FAX) or RIH.IRIS@EPAMAIL.EPA.GOV (internet address).

==========

_VI. BIBLIOGRAPHY

Substance Name -- Benzo[a]pyrene (BaP)
CASRN -- 50-32-8
Last Revised -- 12/01/93

__VI.A. ORAL RfD REFERENCES

None

__VI.B. INHALATION RfD REFERENCES

None

__VI.C. CARCINOGENICITY ASSESSMENT REFERENCES

Brune, H., R.P. Deutsch-Wenzel, M. Habs, S. Ivankovic and D. Schmahl. 1981. Investigation of the tumorigenic response to benzo[a]pyrene in aqueous caffeine solution applied orally to Sprague-Dawley rats. J. Cancer Res. Clin. Oncol. 102(2): 153-157.

Clement Associates. 1990. Ingestion dose-response model to benzo(a)pyrene. EPA Control No. 68-02-4601.

IARC (International Agency for Research on Cancer). 1983. Certain Polycyclic Aromatic Hydrocarbons and Heterocyclic Compounds. Monographs on the Evaluation of Carcinogenic Risk of the Chemical to Man, Vol. 3. Lyon, France.

Knauf, L. and G. Rice. 1992. Statistical Evaluation of Several Benzo[a]pyrene Bioassays. Memorandum to R. Schoeny, U.S. EPA, Cincinnati, OH. January 2.

Neal, J. and R.H. Rigdon. 1967. Gastric tumors in mice fed benzo[a]pyrene -- A quantitative study. Tex. Rep. Biol. Med. 25(4): 553-557.

Rabstein, L.S., R.L. Peters and G.J. Spahn. 1973. Spontaneous tumors and pathologic lesions in SWR/J mice. J. Natl. Cancer Inst. 50: 751-758.

Stiteler, W. 1991. Syracuse Research Corporation, Syracuse, NY. Personal communication with R. Schoeny, U.S. EPA, Cincinnati, OH.

Thyssen, J., J. Althoff, G. Kimmerle and U. Mohr. 1981. Inhalation studies with benzo[a]pyrene in Syrian golden hamsters. J. Natl. Cancer Inst. 66: 575-577.

U.S. EPA. 1991a. Drinking Water Criteria Document for PAH. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Water Regulations and Standards, Washington, DC.

U.S. EPA. 1991b. Dose-Response Analysis of Ingested Benzo[a]pyrene (CAS No. 50-32-8). Human Health Assessment Group, Office of Health and Environmental Assessment, Washington, DC. EPA/600/R-92/045.

==========

_VII. REVISION HISTORY

Substance Name -- Benzo[a]pyrene (BaP)
CASRN -- 50-32-8

Date	Section	Description
08/01/89	VI.	Bibliography on-line
01/01/92	II.	Carcinogen assessment noted as pending change
01/01/92	IV.	Regulatory actions updated
04/01/92	II.	Summary revised; oral quantitative section added
04/01/92	VI.C.	Carcinogen assessment references revised
05/01/92	II.D.2.	Work group review and verification date corrected
07/01/92	II.	Text revised in NOTE
07/01/92	II.B.	Range of slope factors corrected
07/01/92	II.B.1.	Slope factor and risks corrected
07/01/92	II.B.2.	Data table heading corrected
07/01/92	II.B.3.	Slope factor corrected; last paragraph
07/01/92	II.D.3.	Secondary contact changed
09/01/93	II.	Carcinogenicity assessment noted as pending change
09/01/93	II.D.2.	Work group review date added
12/01/93	VI.C.	Reference revised - U.S. EPA, 1991b
02/01/94	II.D.3.	Primary contact's phone number changed
03/01/94	II.	Pending change note removed; no change
03/01/94	II.D.2.	Work group review date added
07/01/94	II.D.2.	Work group review date added
11/01/94	II.B.1.	Slope factor clarified; changed O to "0"

==========

SYNONYMS

Substance Name -- Benzo[a]pyrene (BaP)
CASRN -- 50-32-8
Last Revised -- 03/31/87

50-32-8
BaP
Benzo[a]pyrene
BENZO(d,e,f)CHRYSENE
3,4-BENZOPIRENE
3,4-BENZOPYRENE
6,7-BENZOPYRENE
BENZO(a)PYRENE
3,4-BENZPYREN
3,4-BENZPYRENE
3,4-BENZ(a)PYRENE
BENZ(a)PYRENE
3,4-BENZYPYRENE
BP
3,4-BP
B(a)P
RCRA WASTE NUMBER U022

End of IRIS Substance File